



U.S. NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

COMMISSION BRIEFING

March 21, 2011

**BRIEFING ON NRC RESPONSE TO RECENT
NUCLEAR EVENTS IN JAPAN**

NOT FOR PUBLIC DISCLOSURE

BRIEFING BOOK

NRC "Talking Points" – Current as of March 17, 2011, 0600 EDT

Reactor Status

Fukushima Daiichi Units 1 - 6

- TEPCO is working to restore site power and anticipates restoration to Units 2, 5, and 6 today and Units 1, 3, and 4 tomorrow.

Unit 1

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- As of 2200 JST (0900 EDT) on March 14, it is reported that sea water is being injected with reported stable cooling
- Containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- The spent fuel pool level is unknown
- Radiation levels 150-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate. (Site gate is same for each unit.)
- Core cooling is via the core spray header.

Unit 2

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Reactor Core Isolation Cooling (RCIC) has failed
- Secondary containment: Cut hole in the side of the reactor building superstructure to reduce likelihood of hydrogen gas buildup
- Sea water injection restarted with core cooling reported as not stable
- Primary containment is intact
- Radiation levels 150-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate. (Site gate is same for each unit.)
- The spent fuel pool level is unknown. Some water is available as evidenced by steam emanating from hole.

Unit 3

- Core damage due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Sea water is being injected with reported stable cooling
- Hydrogen explosion from overheated fuel-water reaction has severely damaged reactor building (secondary containment)
- Primary containment described as "functional"
- The spent fuel pool level is possibly drained – some evidence of steam.
- Radiation levels 150-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate. (Site gate is same for each unit.)
- Unit 3 is currently TEPCO's priority (unclear whether reactor or spent fuel pool)
- Water cannon should be onsite soon (as of 0400 EDT)

Unit 4

- Unit was in a refueling outage at the time of the event and core was off loaded to the SFP
- First fire in the reactor building was a small generator lube oil fire. IAEA reports that fire was put out at 2200 EDT, March 14.
- Radiation levels 150-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate. (Site gate is same for each unit.)
- Second fire began at 1645 EDT, March 15, 2011 in reactor building. Fuel reported to be uncovered.
- Radiation level outside Unit 4 reported to be 30R/hour following second fire.

- High radiation dose rates measured between Units 3 and 4, source is suspected to be the Unit 4 spent fuel pool.
- The spent fuel pool's ability to retain water is in doubt, no steam – likely dry.

Unit 5

- The reactor is defueled.
- IAEA Reports Temperature of pool at 64.5 degrees C at 1500 EDT, March 16, 2011.
- Unit 5 diesel generator is providing power to cool Units 5 and 6 spent fuel pools.

Unit 6

- The reactor is defueled.
- IAEA Reports Temperature of pool at 61.0 degrees C at 1300 EDT, March 16, 2011.
- Power to cool the Unit 6 spent fuel pool is being provided by the Unit 5 diesel generator.

Other Japanese Nuclear Sites:

- Fukushima Daiichi Units 1 - 4: As of 7:15 am on March 15 (Japan), Tepco press release reports reactors in cold shutdown and offsite power available.
- Onagawa Units 1 - 3: shutdown, stable, turbine building basement fire extinguished.
- Kashiwazaki Kariwa Nuclear Power Station (Advanced Reactors): Units 1, 5, 6, 7: normal operation / Units 2 to 4: regular outage
- Rokkasho: all units continue safe operations without malfunctions, impacts from earthquake quickly mitigated (emergency diesel generators used, spilt SFP liquid drained and recovered in liquid waste treatment)

Protective Action Recommendations

For Fukushima Daiichi site, Japanese national government issued a protective action recommendation that instructed evacuation for local residents within a 20km radius of the site boundary and sheltering in place out to 30km for residents who stayed behind

- Japan has imposed no-fly zone (30km radius, altitude unlimited) over Daiichi plants.
- A RASCAL run at 06:54AM (EDT) on March 16, 2011 for hypothetical combined core based on the following assumptions: Units 2 & 3 each, 33% core melt & no containment; Unit 4, full core offload 100% melt in the Spent Fuel Pool (SFP) with no roof; wind direction from West Northwest blowing out to the ocean. Results: PAG exceeded at 50 miles (80.5 km) with TDE of 24.0 rem, and CDE thyroid of 130 rem.
- Based upon the degrading situation at the Daiichi plant, the US NRC recommends that Americans within 50 miles of the Daiichi plant to evacuate the area.
- The US State Department has approved voluntary authorized departure for US Government employees at the Embassy in Japan.

Meteorological Conditions:

Forecast meteorological data for the 24 hour period (until 1200 EDT on March 17, 2011) indicates wind headed offshore (from NW)

General Talking Points

- TEPCO and US Forces in Japan (USFJ) are working together to allocate firefighting and heavy equipment capable of pumping seawater from the ocean into containment.
 - TEPCO appears to be supplying water by helicopter and water cannon.
 - A list of additional equipment to provide for accident mitigation has been developed by NRC and provided to USAID.
 - Five portable pumps arrived at the Daiichi facility Thursday (1130 SST) from Yokota Air Force Base. Additional equipment to connect pumps is being coordinated.
- Disaster Assistance Response Team arrived Sunday:

- 11 NRC staff are in Tokyo with the Ambassador and getting information from Japanese officials.
- NRC continues to develop projections of the accident's progression, dose estimates and Q&As, including those addressing the safety of reactors in operation in the US.
Government of Japan has accepted US offer to conduct aerial/ground monitoring and also requested potassium iodide tablets. DOE Aerial Measurement Teams have completed fly over the Daiichi site. Awaiting results.
- The NRC has been asked to provide recommendations for solutions to the spent fuel pool issues during conference call with NISA and TEPCO.

NOT FOR PUBLIC DISCLOSURE

NRC "Talking Points" – Current as of March 16, 2011, 1900 EDT

Reactor Status

Fukushima Daiichi Units 1 - 6

Unit 1

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- As of 2200 JST (0900 EDT) on March 14, it is reported that sea water is being injected with reported stable cooling
- Containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- The spent fuel pool level is unknown
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

Unit 2

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Reactor Core Isolation Cooling (RCIC) has failed
- Hydrogen explosion from overheated fuel-water reaction damaged the reactor building
- Secondary containment: Cut hole to reduce likelihood of hydrogen gas buildup
- Sea water injection restarted with core cooling reported as not stable
- Primary containment is intact.
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)
- The spent fuel pool level is unknown. Some water is available as evidenced by steam emanating from hole.

Unit 3

- Core damage due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Sea water is being injected with reported stable cooling
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- Primary containment described as "functional"
- The spent fuel pool level is possibly drained – some evidence of steam.
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

Unit 4

- First fire in the reactor building was a small generator lube oil fire. IAEA reports that fire was put out at 2200 EDT, March 14.
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)
- Second fire began at 1645 EDT, March 15, 2011 in reactor building. Reports indicate that this fire is not yet contained. Fuel reported to be uncovered.
- Radiation level outside Unit 4 reported to be 30R/hour following second fire.
- High radiation dose rates measured between Units 3 and 4, source is suspected to be the partially uncovered Unit 4 spent fuel pool.
- The spent fuel pool's ability to retain water is in doubt, no steam – likely dry.

Unit 5

- The reactor is defueled.
- Spent fuel pool is reported to be heating up.
- A/C power available from Unit 6 diesel generator.

Unit 6

- The reactor is defueled.
- Spent fuel pool is reported to be heating up.
- A/C power available from diesel generator.

Other Japanese Nuclear Sites:

- Fukushima Daiichi Units 1 - 4: As of 7:15 am on March 15 (Japan), Tepco press release reports reactors in cold shutdown and offsite power available.
- Onagawa Units 1 - 3: shutdown, stable, turbine building basement fire extinguished.
- Kashiwazaki Kariwa Nuclear Power Station (Advanced Reactors): Units 1, 5, 6, 7: normal operation / Units 2 to 4: regular outage

Protective Action Recommendations

- For Fukushima Daiichi site, Japanese national government issued a protective action recommendation that instructed evacuation for local residents within a 20km radius of the site boundary and sheltering in place out to 30km for residents who stayed behind
- Japan has imposed no-fly zone (30km radius, altitude unlimited) over Daiichi plants.
- A RASCAL run at 06:54AM (EDT) on March 16, 2011 for hypothetical combined core based on the following assumptions: Units 2 & 3 each, 33% core melt & no containment; Unit 4, full core offload 100% melt in the Spent Fuel Pool (SFP) with no roof; wind direction from West/northwest blowing out to the ocean. Results: PAG exceeded at 50 miles (80.5 km) with TEDE of 24.0 rem, and GDE thyroid of 130 rem.

Meteorological Conditions:

As of 1100 EDT, March 16, wind direction is from the West and wind speed is between 10-20 mph. This wind direction not expected to change significantly until the next front comes through over the weekend.

General Talking Points

- Based upon the degrading situation at the Daiichi plant, the US NRC recommends that Americans within 50 miles of the Daiichi plant to evacuate the area.
- 6.1 Aftershock near Hamana: no damage to reactors
 - 5 reactors: 2 are decommissioned; 1 shutdown; 2 operating
- TEPCO and US Forces in Japan (USFJ) are working together to allocate firefighting and heavy equipment capable of pumping seawater from the ocean into containment.
 - A list of additional equipment to provide for accident mitigation has been developed by NRC and provided to USAID.
- Disaster Assistance Response Team arrived Sunday:
 - NRC staff are in Tokyo with the Ambassador and getting information from Japanese officials.
- NRC continues to develop projections of the accident's progression, dose estimates and Q&As, including those addressing the safety of reactors in operation in the US.
- Government of Japan has accepted US offer to conduct aerial/ground monitoring and also requested potassium iodide tablets. DOE Aerial Measurement Teams are expected to fly over the Daiichi site on March 17 at around 0900 local time (2000 EDT).
The NRC has been asked to provide recommendations for solutions to the spent fuel pool issues during conference call with NISA and TEPCO.

NRC "Talking Points" - Current as of March 16, 2011, 1400 EDT

Reactor Status

- Fukushima Daiichi Units 1 - 6

Unit 1

- Core damage from insufficient cooling water caused by loss of offsite power and onsite diesel generators following tsunami
- Sea water being injected with reported stable cooling
- Primary containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction damaged reactor building (secondary containment)
- Spent fuel pool level is unknown
- High radiation levels reduced to 600 microsieverts/hr (60 millirem/hr) at 2:00 am EDT (March 15) at site gate. Site gate is same for each unit.

Unit 2

- Core damage from insufficient cooling water caused by loss of offsite power and onsite diesel generators following tsunami
- Sea water being injected
- Core cooling reported as not stable
- Loud sound near containment building caused concern that containment integrity is not assured
 - Reported at 7:30 AM EDT, March 15, that containment is intact (better than previously thought)
 - NHK cites NISA that there is partial damage to the containment
- Secondary containment: Cut hole to reduce likelihood of hydrogen gas buildup
- Spent fuel pool level is unknown. Possibility of steam/smoke from water boil-off or zirc-water interaction
- High radiation levels reduced to 600 microsieverts/hr (60 millirem/hr) at 2:00 am EDT (March 15) at site gate. Site gate is same for each unit.

Unit 3

- Core damage from insufficient cooling water caused by loss of offsite power and onsite diesel generators following tsunami
- Sea water being injected with reported stable cooling
- Primary containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction damaged reactor building (secondary containment)
- Spent fuel pool level is unknown. Possibility of steam/smoke from water boil-off or zirc-water interaction
- High radiation levels reduced to 600 microsieverts/hr (60 millirem/hr) at 2:00 am EDT (March 15) at site gate. Site gate is same for each unit.

Unit 4

- First fire: Generator lube oil fire in reactor building; IAEA reports that fire out at 2200 EDT, March 14.
- High radiation levels reduced to 600 microsieverts/hr (60 millirem/hr) at 2:30 am EDT (March 15) at site gate
- Second fire began 5:45am local time in reactor building. Reports indicate not yet contained. TEPCO determining whether to use helicopter or fire truck to fight fire. Fuel reported uncovered.
- TEPCO reported 30R/hr inside Unit 4 following second fire.
- Reports of hydrogen explosion in Unit 4 due to uncovered fuel in the fuel pool. Secondary containment is destroyed. There is no water in the spent fuel pool and the

pool's ability to retain water is in doubt.

Unit 5

- IAEA reports that water level in the SFP was down 40 cm in 5 hours since 0800 EDT, March 15, 2011. TEPCO plans to use operational diesel generator at Unit 6 to provide water to Unit 5.

Unit 6 stable

- Reactor spent fuel pool level unknown. Heatup reported.

Other Japanese Nuclear Sites:

- Fukushima Daiichi Units 1 - 4: As of 7:15 am on March 15 (Japan), Tepco press release reports reactors in cold shutdown and offsite power available.
- Onagawa Units 1 - 3: shutdown, stable, turbine building basement fire extinguished.
- Kashiwazaki Kariwa Nuclear Power Station (Advanced Reactors): Units 1, 5, 6, 7: normal operation / Units 2 to 4: regular outage

Protective Action Recommendations

- For Fukushima Daiichi site, Japanese national government issued a protective action recommendation that instructed evacuation for local residents within a 20km radius of the site boundary and sheltering in place out to 30km for residents who stayed behind
- Japan has imposed no-fly zone (30km radius, altitude unlimited) over Daiichi plants.
- A RASCAL run at 06:54AM (EDT) on March 16, 2011 for hypothetical combined core based on the following assumptions: Units 2 & 3 each, 33% core melt & no containment; Unit 4, full core offload 100% melt in the Spent Fuel Pool (SFP) with no roof; wind direction from West Northwest blowing out to the ocean. Results: PAG exceeded at 50 miles (80.5 km) with TEDE of 24.0 rem, and CDE thyroid of 130 rem.

Metereological Conditions:

As of 1100 EDT, March 16, wind direction is from the West and wind speed is between 10-20 mph. This wind direction not expected to change significantly until the next front comes through over the weekend.

General Talking Points

- Based upon the degrading situation at the Daiichi plant, the US NRC recommends that Americans within 50 miles of the Daiichi plant to evacuate the area.
- 6.1 Aftershock near Hamaoka, no damage to reactors
 - 5 reactors: 2 are decommissioned; 1 shutdown; 2 operating
- TEPCO and US Forces in Japan (USFJ) are working together to allocate firefighting and heavy equipment capable of pumping seawater from the ocean into containment.
 - A list of additional equipment to provide for accident mitigation has been developed by NRC and provided to USAID.
- Disaster Assistance Response Team arrived Sunday:
 - 11 NRC staff are in Tokyo with the Ambassador and getting information from Japanese officials.
- NRC continues to develop projections of the accident's progression, dose estimates and Q&As, including those addressing the safety of reactors in operation in the US.
- Government of Japan has accepted US offer to conduct aerial/ground monitoring and also requested potassium iodide tablets. DOE Aerial Measurement Teams are expected to fly over the Daiichi site on March 17 at around 0900 local time (2000 EDT).
- The NRC has been asked to provide recommendations for solutions to the spent fuel pool issues during conference call with NISA and TEPCO.

NRC "Talking Points" - Current as of March 16, 2011, 0630 EDT

Reactor Status

- Fukushima Daiichi Units 1 - 6

Unit 1

- Core damage from insufficient cooling water caused by loss of offsite power and onsite diesel generators following tsunami
- Sea water being injected with reported stable cooling
- Primary containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction damaged reactor building (secondary containment)
- Spent fuel pool level decreasing
- High radiation levels reduced to 600 microsieverts/hr (60 millirem/ hr) at 2:00 am EDT (March 15) at site gate. Site gate is same for each unit.
- GE reports possible RCS breach

Unit 2

- Core damage from insufficient cooling water caused by loss of offsite power and onsite diesel generators following tsunami
- Sea water being injected
- Core cooling reported as not stable
- Loud sound near containment building caused concern that containment integrity is not assured
 - Reported at 7:30 AM EDT, March 15, that containment is intact (better than previously thought)
 - NHK cites NISA that there is partial damage to the containment
- Secondary containment: Cut hole to reduce likelihood of hydrogen gas buildup
- Spent fuel pool level decreasing
- High radiation levels reduced to 600 microsieverts/hr (60 millirem/ hr) at 2:00 am EDT (March 15) at site gate. Site gate is same for each unit.

Unit 3

- Core damage from insufficient cooling water caused by loss of offsite power and onsite diesel generators following tsunami
- Sea water being injected with reported stable cooling
- Primary containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction damaged reactor building (secondary containment)
- No spent fuel pool information; zirc-water interaction
- High radiation levels reduced to 600 microsieverts/hr (60 millirem/hr) at 2:00 am EDT (March 15) at site gate. Site gate is same for each unit.

Unit 4

- First fire: Generator lube oil fire in reactor building; IAEA reports that fire out at 2200 EDT, March 14.
- High radiation levels reduced to 600 microsieverts/hr (60 Mr/hr) at 2:30 am EDT (March 15) at site gate
- Second fire began 5:45am local time in reactor building. Reports indicate not yet contained. TEPCO determining whether to use helicopter or fire truck to fight fire. Fuel reported uncovered.
- TEPCO reported 30R/hr inside Unit 4 following second fire.
- Reports of hydrogen explosion in Unit 4 due to uncovered fuel in the fuel pool. Secondary containment is destroyed. There is no water in the spent fuel pool nor

ability to retain water.

Unit 5

- IAEA reports that water level in (RPV or SFP?) was down 40 cm in 5 hours since 0800 EDT, March 15, 2011. TEPCO plans to use operational diesel generator at Unit 6 to provide water to Unit 5.

Unit 6 stable

- Reactor spent fuel pool level unknown. Heatup reported.

Other Japanese Nuclear Sites:

- Fukushima Daiichi Units 1 - 4: As of 7:15 am on March 15 (Japan), Tepco press release reports reactors in cold shutdown and offsite power available.
- Onagawa Units 1 - 3: shutdown, stable, turbine building basement fire extinguished.
- Kashiwazaki Kariwa Nuclear Power Station (Advanced Reactors): Units 1, 5, 6, 7: normal operation / Units 2 to 4: regular outage

Protective Action Recommendations

- For Fukushima Daiichi site, Japanese national government issued a protective action recommendation that instructed evacuation for local residents within a 20km radius of the site boundary and sheltering in place out to 30km for residents who stayed behind
- Japan has imposed no-fly zone (30km radius, altitude unlimited) over Daiichi plants.
- On March 16, 0030, the PMT ran RASCAL offsite dose estimations for a hypothetical Unit 4 spent fuel pool zirconium fire scenario, and considering actual and forecasted meteorological conditions for 24 hours. Assumptions were conservative. PAGs for TEDE and CDE extended out beyond 40 miles based on this hypothetical scenario.

Meteorological Conditions:

As of 0500 EDT, March 16, wind direction is from the NW and wind speed is approximately 15 mph. This wind direction not expected to change significantly until the next front comes through over the weekend (currently expected to shift on Sunday).

General Talking Points

- The NRC provided to the Ambassador our current understanding of condition at Daiichi and associated dose projections to be shared with the Japanese government.
 - We advise Americans in Japan to follow the guidance of Japanese officials.
- 6.1 Aftershock near Hamadaka: no damage to reactors
 - 5 reactors: 2 are decommissioned; 1 shutdown; 2 operating
- TEPCO and US Forces in Japan (USFJ) are working together to allocate firefighting and heavy equipment capable of pumping seawater from the ocean into containment.
 - A list of additional equipment to provide for accident mitigation has been developed by NRC and provided to USAID.
- Disaster Assistance Response Team arrived Sunday:
 - Two NRC team members are in Tokyo working with Ambassador Roos and getting direct information from Japanese officials.
 - Nine additional NRC experts arrived to support the Ambassador and Japanese government.
- NRC continues to develop projections of the accident's progression, dose estimates and Q&As, including those addressing the safety of reactors in operation in the US.
- Government of Japan has accepted US offer to conduct aerial/ground monitoring and also requested potassium iodide tablets. DOE Aerial Measurement Teams are expected to fly over the Daiichi site on March 17 at around 0900 local time (2000 EDT).
- The NRC has been asked to provide recommendations for solutions to the spent fuel pool issues for conference call with NISA and TEPCO.

TEPCO "Talking Points" – Current as of March 15, 2011, 2230 EDT

Reactor Status

- Fukushima Daiichi Units 1 - 6

Unit 1

- Core damage from insufficient cooling water caused by loss of offsite power and onsite diesel generators following tsunami
- Sea water being injected with reported stable cooling
- Primary containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction damaged reactor building (secondary containment)
- Spent fuel pool level unknown
- High radiation levels reduced to 600 microsieverts/hr (60 millirem/ hr) at 2:00 am EDT (March 15) at site gate. Site gate is same for each unit.

Unit 2

- Core damage from insufficient cooling water caused by loss of offsite power and onsite diesel generators following tsunami
- Sea water being injected
- Core cooling reported as not stable
- Loud sound near containment building caused concern that containment integrity is not assured
 - Reported at 7:30 AM EDT, March 15, that containment is intact (better than previously thought)
- Secondary containment: Cut hole to reduce likelihood of hydrogen gas buildup
- Spent fuel pool level unknown
- High radiation levels reduced to 600 microsieverts/hr (60 millirem/ hr) at 2:00 am EDT (March 15) at site gate. Site gate is same for each unit.

Unit 3

- Core damage from insufficient cooling water caused by loss of offsite power and onsite diesel generators following tsunami
- Sea water being injected with reported stable cooling
- Primary containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction damaged reactor building (secondary containment)
- No spent fuel pool information
- High radiation levels reduced to 600 microsieverts/hr (60 millirem/hr) at 2:00 am EDT (March 15) at site gate. Site gate is same for each unit.

Unit 4

- First fire: Generator lube oil fire in reactor building; IAEA reports that fire out at 2200 EDT, March 14.
- High radiation levels reduced to 600 microsieverts/hr (60 Mr/hr) at 2:30 am EDT (March 15) at site gate
- Second fire began 5:45am local time in reactor building. Reports indicate not yet contained. TEPCO determining whether to use helicopter or fire truck to fight fire. Fuel reported uncovered.
- TEPCO reported 30R/hr inside Unit 4 following second fire.
- Reports of hydrogen explosion in Unit 4 due to uncovered fuel in the fuel pool. Awaiting visual evidence.

Units 5 - 6 stable

- Reactor spent fuel pool level unknown. Heatup reported.

Inner Japanese Nuclear Sites:

- Fukushima Daiichi Units 1 - 4: As of 7:15 am on March 15 (Japan), Tepco press release reports reactors in cold shutdown and offsite power available.
- Onagawa Units 1 - 3: shutdown, stable, turbine building basement fire extinguished.
- Kashiwazaki Kariwa Nuclear Power Station (Advanced Reactors): Units 1, 5, 6, 7: normal operation / Units 2 to 4: regular outage

Protective Action Recommendations

- For Fukushima Daiichi site, Japanese national government issued a protective action recommendation that instructed evacuation for local residents within a 20km radius of the site boundary and sheltering in place out to 30km for residents who stayed behind
- Forecast meteorological data for the 24 hour period (until 5:00pm EDT 5/15) indicates wind remaining toward offshore (N, NW).
- Japan has imposed no-fly zone (30km radius, altitude unlimited) over Daiichi plants.

General Talking Points

- The NRC believes the Japanese response and protective actions are comparable to how the NRC would respond.
 - We advise Americans in Japan to follow the guidance of Japanese officials.
- 6.1 Aftershock near Hamaoka: no damage to reactors
 - 5 reactors: 2 are decommissioned; 1 shutdown; 2 operating
- Tepco and US Forces in Japan (USFJ) are working together to allocate firefighting and heavy equipment capable of pumping seawater from the ocean into containment.
 - A list of additional equipment to provide for accident mitigation has been developed by NRC and provided to USAID.
- Disaster Assistance Response Team arrived Sunday:
 - Two NRC team members are in Tokyo working with Ambassador Roos and getting direct information from Japanese officials
 - Nine additional NRC experts were dispatched to support the Ambassador and Japanese government.
- NRC continues coordination with other Federal agencies and outreach to Congress and States.
- Press releases with message for US citizens: No harmful levels of radiation expected to reach US. Japanese protective action recommendations are not inconsistent with US. US citizens in Japan should follow Japanese government directions.
- NRC continues to develop projections of the accident's progression, dose estimates and Q&As, including those addressing the safety of reactors in operation in the US.
- Government of Japan has accepted US offer to conduct aerial/ground monitoring and also requested potassium iodide tablets.

USNRC Emergency Operations Center Status Update

March 18, 2011
Earthquake / Tsunami Status Update
Compiled by Executive Briefing Team

This report was changed to include NRC's current understanding of the ongoing situation in Japan. Historical and background information can be found in past reports.

USNRC Status

At 0946 EST, March 11, 2011, the NRC entered Monitoring Mode and the agency continues to monitor the unfolding events in Japan. The Headquarters Operations Center is staffed 24/7.

A total of 11 NRC experts supporting USAID response efforts from the NRC are in Japan and have engaged with the US Ambassador and his staff.

At 0550 EDT, March 14, 2011, the NRC experts in Japan reported that the Japanese have requested US technical assistance with cooling the Fukushima Daiichi Units, as needed. The effort is being coordinated by the US Ambassador. At 0900 EDT, March 15, 2011, the Japanese government accepted DOE's Radiological Assistance Program (RAP) team assistance, which includes Aerial Measuring System (AMS) flyovers.

On March 16, NRC provided the White House with information on protective measures for NRC staff in Japan and information to provide advice for other federal workers in Japan. The current protective action recommendation for U.S. citizens residing within 50 miles (80 km) of the Fukushima Daiichi site is to evacuate.

The US State Department has approved voluntary authorized departure of family members at the U.S. Embassy in Tokyo, the U.S. Consulate in Nagoya and the Foreign Service Institute in Yokohama.

Japanese Ministry of Defense appears to be taking on a larger role in the response effort.

NRC has issued numerous press releases related to the earthquake and tsunami. These press releases can be found online at: <http://www.nrc.gov/reading-rm/doc-collections/news/2011/>

Current Top Priorities

Currently, NRC's top priorities are determining radiological conditions, dose projections, and protective action recommendations, as well as facilitating the design, procurement, and delivery of temporary pumping equipment for emergency cooling.

Bechtel has completed engineering design work and is working with vendors to procure the required material. USAID has not yet authorized payment for these activities. GE Hitachi may be the organization that will install and operate the equipment.

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Earthquake/Tsunami Status Update March 18, 2011

0600 EDT

Status of NRC Licensee and Agreement State Facilities

NRC is discontinuing reporting status of NRC licensee and Agreement State facilities. NRC will resume this reporting should any issues arise related to earthquake or tsunami effects. NRC is currently working on a generic communication for distribution to the U.S. nuclear power reactor fleet.

The Institute of Nuclear Power Operations (INPO) issued a Level 1 Event Report (highest level) to its members on the afternoon of March 15, 2011. It identifies 4 actions, with due dates, and requires a written response. In general, the actions include walkdowns and verifications of aspects of facility capabilities to address B.5.b equipment and procedures, Severe Accident Management Guidelines (SAMGs), mitigation of station blackout (SBO) conditions, mitigation of internal and external flooding, and fire and flooding events that could be impacted by a concurrent seismic event.

The Nuclear Energy Institute (NEI) issued two fact sheets on March 16, 2011 "Industry Taking Action to Ensure Continued Safety at U.S. Nuclear Energy Plants" and "Used Nuclear Fuel Storage at the Fukushima Daiichi Nuclear Power Plant."

Current Understanding of Japanese Facilities

(This information is compiled from TEPCO press releases, IAEA information releases, Federation of Electric Power Companies of Japan, Japan Atomic Industrial Forum, World Association of Nuclear Operators, the NRC in-country team and others.)

Fukushima Daiichi

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary and sheltering in place out to 30 km for residents who stayed behind. As of March 12, a 10 km complete radius evacuation has been ordered for the public. IAEA confirms a no-fly zone out to 30 km around the Fukushima Daiichi plant. As of 1830 EDT on March 15, 2011, there have been no updates to protective actions.

Japanese authorities have changed the classification of the event from a Level 4 to a Level 5 "Accident with Wider Consequences" on the International Nuclear and Radiological Event Scale (INES).

NHK media report on March 17, 0100 EDT stated that helicopter crews dumping water on Unit 3 reactor building reported dose rates at 375 R/hr at 300 ft. above the building.

An array of fire trucks have been deployed at the site and appeared to be supplying / spraying water over Unit 3.

Available information indicates that the majority of releases from the Fukushima site have been carried out to sea by the prevailing winds. Forecast meteorological data for the 24 hour period until 2000 EDT on March 18, 2011 indicates wind headed offshore (from NW/westerly).

DOE Aerial Measurement Teams have completed two flyovers of the Daiichi site. Data from the second flyover was received and is being analyzed.

The NRC in-country team is embedding a staffer at the TEPCO EOC.

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Earthquake/Tsunami Status Update March 18, 2011

0600 EDT

NRC Priority	Fukushima Daiichi STATUS as of 1500 EDT, March 17, 2011 - (0400 Japan)	Unit
1	Core Status: damaged	3
	Core Cooling: RCS depressurized; radiation released; sea water injected to cool core (Source: JAIF)	
	Primary Containment: some damage	
	Secondary Containment: lost (visual)	
	Spent Fuel Pool: 514 bundles in pool; low water level; helicopters flew to drop water and water cannon truck sprayed water on March 17. (Source: METI), fire trucks are supplying sea water for cooling spray	
2	Core Status:	4
	Core Cooling	
	Primary Containment	
	Secondary Containment: lost (visual)	
	Spent Fuel Pool: 1201 bundles in pool; pool dry?; damage to fuel rods suspected; water was dumped on site with water cannons. fire trucks are supplying seawater for cooling spray	
3	Core Status: damaged	2
	Core Cooling: RCS depressurized; sea water inject to cool core (Source: JAIF)	
	Primary Containment: possible torus damage	
	Secondary Containment: hole cut in side of fuel floor metal to reduce H2 buildup	
	Spent Fuel Pool: 587 bundles in pool, fire trucks are supplying seawater for cooling spray	
4	Core Status: damaged	1
	Core Cooling: RCS depressurized; sea water inject to cool core (Source: JAIF)	
	Primary Containment: functional	
	Secondary Containment: lost (visual)	
	Spent Fuel Pool: 292 bundles in pool, water level unknown, fire trucks are supplying seawater for cooling spray	
5	Shutdown since January 3, 2011	5
	Core Status: core in RPV (Source: INPO)	
	Spent Fuel Pool: 950 bundles; unit 6 emergency diesel generator available	
6	Shutdown since August 14, 2010	6
	Core Status: core in RPV (Source: INPO)	
	Spent Fuel Pool: 876 bundles; unit's emergency diesel generator available	
7	Common Spent Fuel Pool: 6,000 bundles located on land side of Unit 4	N/A
	Electrical Power: Restoration from Switchyard to Unit 2 480v pumps (first) in progress	

Earthquake/Tsunami Status Update March 18, 2011

0600 EDT

Fukushima Daini

- No changes to report

Onagawa

- No changes to report

Rokkasho

- No changes to report

Protective Measures Team (PMT) Conducting Two Analyses

PMT is actively working with DOE, NARAC, and other Federal Agencies to refine and model offsite dose calculation models to estimate the potential for radio nuclides to reach US territories. The models assume fuel damage, containment damage, and damage to some spent fuel pools with open access to the environment.

Wind shift over land not expected until Sunday, March 20, 2011.

International Response

- IAEA sent a two person team to conduct coordination activities and to take measurements. NRC communicated with IAEA to discuss the status and concerns.
- France has shared technical data with the NRC and publicly posted their assessment of doses in Tokyo on the IRSN website.
- Spain Parliament is still reviewing and deciding on support levels.
- Italy is interested in discussing what the USG is doing, and might be interested in helping in some way.
- China has offered to help.
- Russia has sent a team to Tokyo. The U.S. team is planning to meet to understand Russian capabilities and to coordinate activities.

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Earthquake/Tsunami Status Update March 18, 2011

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Reference

Units

1 rem (rem) = 1,000 millirem (mrem)

1 Sievert (Sv) = 1,000 milliSieverts (mSv) = 1,000,000 microsieverts (μSv)

1 rem = 0.01 Sv = 10 mSv

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USNRC Emergency Operations Center Status Update

March 17, 2011
Earthquake / Tsunami Status Update
Compiled by Executive Briefing Team

Caution – This information may be dated and is subject to constant change.
Changes/Additions from previous updates are underlined

USNRC Status

At 0946 EST, March 11, 2011, the NRC entered Monitoring Mode and the agency continues to monitor the unfolding events in Japan. The Headquarters Operations Center is staffed.

A total of 11 NRC experts supporting USAID response efforts from the NRC are in Japan and have engaged with the US Ambassador's staff.

At 0550 EDT, March 14, 2011, the NRC experts in Japan reported that the Japanese have requested US technical assistance with cooling the Fukushima Daiichi Units 1, 2, and 3. The effort is being coordinated by the US Ambassador. At 0900 EDT, March 15, 2011, the Japanese government accepted DOE's Radiological Assistance Program (RAP) team assistance, which includes Aerial Measuring System (AMS) fly-overs.

NRC provided the White House with information on protective measures for NRC staff in Japan and information to provide advice for other federal workers in Japan. The current protective action recommendation for U.S. citizens residing within 50 miles (80 km) of the Fukushima Daiichi site is to evacuate.

The US State Department has approved voluntary authorized departure of family members at the U.S. Embassy in Tokyo, the U.S. Consulate in Nagoya and the Foreign Service Institute in Yokohama.

NRC has issued numerous press releases related to the earthquake and tsunami. These press releases can be found online at: <http://www.nrc.gov/reading-rm/doc-collections/news/2011/>

Status of NRC Licensee and Agreement State Facilities

At this time, NRC is discontinuing reporting status of NRC licensee and Agreement State facilities. NRC will resume this reporting should any issues arise related to earthquake or tsunami effects.

The Institute of Nuclear Power Operations (INPO) issued a Level 1 Event Report (highest level) to its members on the afternoon of March 15, 2011. It identifies 4 actions, with due dates, and requires a written response. In general, the actions include walkdowns and verifications of

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Earthquake/Tsunami Status Update March 17, 2011

1700 EDT

aspects of facility capabilities to address B.5.b equipment and procedures, Severe Accident Management Guidelines (SAMGs), mitigation of station blackout (SBO) conditions, mitigation of internal and external flooding, and fire and flooding events that could be impacted by a concurrent seismic event.

The Nuclear Energy Institute (NEI) issued two fact sheets on March 16, 2011: "Industry Taking Action to Ensure Continued Safety at U.S. Nuclear Energy Plants" and "Used Nuclear Fuel Storage at the Fukushima Daiichi Nuclear Power Plant."

Status of Japanese Facilities

(This information is compiled from available sources, including press releases by the Tokyo Electric Power Company (TEPCO) and information from the International Atomic Energy Agency (IAEA)).

IAEA reports that at 1331 UTC on March 15, 2011 a 6.1 magnitude earthquake occurred in eastern Honshu, approximately 100 km from the Hamaoka nuclear power plant. Operational units at the plant remain in safe status after the earthquake.

Background:

There are 14 operational Boiling Water Reactors (BWRs) proximal to the earthquake zone (6 at Fukushima Daiichi, 4 at Fukushima Daini, 3 at Onagawa, and 1 at Tokai)

Current Understanding of Japanese Reactor Status

(This information is compiled from TEPCO press releases and IAEA information releases.)

Fukushima Daiichi

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary and sheltering in place out to 30 km for residents who stayed behind. As of March 12, a 10 km complete radius evacuation has been ordered for the public. IAEA confirms a no-fly zone out to 30 km around the Fukushima Daiichi plant. As of 1830 EDT on March 15, 2011, there have been no updates to protective actions.

Japanese authorities classified the event at a Level 4 "Accident with Local Consequences" on the International Nuclear and Radiological Event Scale (INES) based on radioactive dose measurements at the site boundary exceeding limit values.

Federation of Electric Power Companies of Japan (FEPC) reported at 1015 EST, March 16, 2011:

- Dose rate at main gate (monitoring station 6) ranged from 150 mr/hr to 1000 mr/hr.
- 10 Rem/hr west of Unit 3 and 4 (assuming on roadway next to reactor buildings)
- 30 Rem/hr between Units 2 and 3
- 40 Rem/hr between Units 3 and 4

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Earthquake/Tsunami Status Update March 17, 2011

1700 EDT

NHK media report on March 17, 0100 EDT stated that helicopter crews dumping water on Unit 3 reactor building reported dose rates at 375 R/hr at 300 ft. above the building.

- Offsite dose measured in Tokai on the coast 100 km NE of Tokyo on March 14 at 1845 EDT was 5 uSv/hr.
- On March 14, NISA reported 160 people were exposed to radiation around the Fukushima nuclear power plant. 170,000 people have been evacuated.
- A no-fly zone was implemented 30 km from the site from zero to unlimited altitude. Source from DOE NIT who talked with FAA.
- On March 16, DTRA data is from 165 miles SSW from the site.

All available information indicates that the majority of releases from the Fukushima site have been carried out to sea by the prevailing winds. Forecast meteorological data for the 24 hour period (until 1200 EDT on March 17, 2011) indicates wind headed offshore (from NW).

Units 1, 2, and 3: shutdown due to earthquake

- At approximately 1000 EDT, March 14, 2011, Unit 2 core was again uncovered.

Units 4, 5, and 6: shutdown due to outage, prior to earthquake

- Operators and other personnel not directly involved in water injection have been evacuated. 40-50 persons have been left onsite to mitigate accident.
- Unit 5 diesel generator is providing power to cool Unit 5 and Unit 6 spent fuel pool.

TEPCO is working to restore site power and anticipates restoration to Units 2,5, and 6 today and Units 1, 3, and 4 tomorrow.

Five portable pumps have arrived at the Daiichi site and additional equipment to connect the pumps is being coordinated.

DOE Aerial Measurement Teams have completed fly-over of the Daiichi site. Data was received and is being analyzed.

Priority	Unit	Fukushima Daiichi STATUS AS OF 1500 EDT, 03/17/2011 - (0400 JDT)
1	3	Core Status Damaged, fuel >1/2 covered, RCS depressurized (FEPC) Radiation released. Sea water injection sufficient to cool core. (WANO)
		Containment Primary Containment, some damage. Secondary Containment lost (visual).
		Spent Fuel Pool 514 Bundles in SFP (GEH) Low Level (JAIF), Dumping water with helicopter suspended (NRC staff in Japan 0420 EDT)
2	4	Spent Fuel Pool ?Pool is dry? 1201 Bundles in SFP (GEH) Damage to fuel rods suspected (JAIF) dumping water from helicopter suspended (Casto 0420 EDT)
3	2	Core Status damaged, fuel 2/3 covered, RCS depressurized (FEPC). Sea

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Earthquake/Tsunami Status Update March 17, 2011

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		water inject enough to cool core (WANO)
		Containment Primary Containment, some damage. Secondary Containment, Hole cut in side of Fuel Floor metal to reduce H2 buildup, steam coming from hole (visual).
		Spent Fuel Pool 587 Bundles in SFP (GEH) No information on SFP status (JAIF).
4	1	Core Status damaged, >1/2 fuel covered, RCS depressurized (FEPC) Sea water inject enough to cool core (WANO)
		Containment Primary Containment functional (JAIF) Secondary Containment lost (visual)
		Spent Fuel Pool 292 Bundles in SFP (GEH) SFP Level unknown (JAIF).
5	5	Shutdown since 1/3/11. Core in RPV. SFP 950 Bundles (GEH), Unit 6 EDG providing power
6	6	Shutdown since 8/14/10. Core in RPV. SFP 876 Bundles (GEH), Unit's EDG available.
7	N/A	Common Spent Fuel Pool: 6,000 spent fuel bundles (GEH) Located on land side of Unit 4 (visual)
		Electrical Power Restoration from Switchyard to Unit 2 480 v Pumps (first) in progress

(Sources: FEPC – Federation of Electric Power Companies of Japan; GEH – General Electric Hitachi; JAIF – Japan Atomic Industrial Forum; WANO – World Association of Nuclear Operators)

Fukushima Daini

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary. As of 1510 EST, March 12, 2011, an estimated 30,000 people have been evacuated. Full evacuation is not complete. As of 1830 EDT on March 15, 2011, there have not been updates to this information. The Daini units have AC power, and were previously reported to have lost their ultimate heat sink.

Unit 1-4

• All units have stable offsite power

• All units are reported to be in cold shutdown with stable water level

• Latest TEPCO reports do not mention any problem with the ultimate heat sink

Onagawa

At 2145 CET, March 13, 2011, IAEA reported that Japanese authorities had informed it that radioactivity levels at the site boundary of the Onagawa Nuclear Power Plant have returned to normal background levels.

Earthquake/Tsunami Status Update March 17, 2011

1700 EDT

Unit 1-3

- All units are shutdown and stable
- The fire in the turbine building has been extinguished

Rokkasho

Earthquake cut off power supply, but diesel generators were immediately connected. Some water spilled from spent fuel pool – liquid was drained and appropriately recovered in liquid waste treatment system. Power supplies are restored to commercial electricity. All units operating.

NRC Evaluation of Radiation Measurements from the USS Ronald Reagan and USS George Washington

On the morning of March 13, 2011, Naval Reactors notified the NRC that dose rates were being measured from the flight deck of the USS Reagan that was ~130 nautical miles off the Japanese coast. Dose rates from the overhead "plume" were approximately 0.6 mrem/hour gamma with no measurable activity on the ship surfaces. The NRC had received an IAEA report showing dose rates of 100 mrem/hour up wind at the site boundary measured ~20 hours earlier and press reports for the previous day of plant venting. Given the meteorological conditions, wind speed of 3-5 mph and the calm Class D and E' weather stability for the 20-24 hour time period, a plume with low dose rates from the venting is credible at this location.

NRC staff believes that US Naval readings are not inconsistent based on reports and shine dose measurements received from Japanese officials during venting from Fukushima Daiichi Units 1, 2, and 3.

The Navy sent the contamination samples to a base in Japan to perform an isotopic analysis to determine the actual radionuclides. The principle radionuclides identified were iodine, cesium, and technetium, consistent with a release from a nuclear reactor.

The US 7th Fleet has repositioned its ships out of the downwind plume direction from the Fukushima Daiichi Nuclear Power Plant after detecting low level contamination in the air and on its aircraft operating in the area.

The US Navy identified radiological data from the USS George Washington located at Yokosuka Base at 0300 EDT on March 15, 2011, that showed an air sample of 7E-9 $\mu\text{Ci/mL}$, from which the Navy estimated a dose rate of 1.5 mrem/hour.

Reactor Safety Team Worst Case Analysis

Hypothetical Worst Case Daiichi Units 1, 2 and 3 Accident Sequence Based on our Knowledge of Current Plant Conditions

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Earthquake/Tsunami Status Update March 17, 2011

1700 EDT

In this hypothetical event in which no cooling water is added to the core, the water level in the core will decrease, exposing the top of the core to a steam environment and a subsequent heat-up of the fuel rods. As the water continues to boil and recede toward the core bottom, the heat-up rate of the rods will increase rapidly resulting in fuel cladding failure and melt. With the continued lack of cooling water, the melting rods will relocate toward the bottom of the core and eventually into the lower plenum of the reactor vessel. Molten fuel and core debris entering the lower plenum will then cause the lower plenum liquid to boil. If cooling water is added to the drywell to a level above the top elevation of the lower plenum, lower head failure can be prevented. With no cooling water added to the drywell, the lower head will fail by creep rupture allowing molten fuel to enter the drywell. Moreover, the absence of cooling water to the drywell could also result in a containment failure. With cooling water added to the drywell, however, a containment venting capability is also needed to preclude failure from over-pressurization. A containment failure will result in a large radioactive release to the environment.

Please note that failure to add water to the core and drywell is a hypothetical worst case event that will result in containment failure and radioactive release to the environment.

Protective Measures Team (PMT) Worst Case Analysis

A RASCAL run at 0654 EDT on March 16, 2011 for hypothetical combined core based on the following assumptions: Units 2 & 3 each, 33% core melt & no containment; Unit 4, full core offload 100% melt in the Spent Fuel Pool (SFP) with no roof; wind direction from West Northwest blowing out to the ocean. Results: RAS exceeded at 50 miles (80.5 km) with TEDE of 24.0 rem, and CDE thyroid of 130 rem.

PMT has transmitted agreed source term to NARAC and is awaiting updated dose projections for along Japan and trans-Pacific for doses to US west coast. First AMS run data received. PMT working to correlate AMS data with limited survey data from Japan.

Wind shift over land not expected until Sunday.

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(This information is compiled from TEPCO press releases and IAEA information releases.)

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OFFICIAL USE ONLY

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- On March 14, NISA reported 160 people were exposed to radiation around the Fukushima nuclear power plant. 170,000 people have been evacuated.
- A no-fly zone was implemented 30 km from the site from zero to unlimited altitude. Source from DOE NIT who talked with FAA.
- On March 16, DTRA data is from 165 miles SSW from the site.

All available information indicates that the majority of releases from the Fukushima site have been carried out to sea by the prevailing winds. Forecast meteorological data for the 24 hour period (until 1200 EDT on March 17, 2011) indicates wind headed offshore (from NW).

Units 1, 2, and 3: shutdown due to earthquake

- At approximately 1000 EDT, March 14, 2011, Unit 2 core was again uncovered.

Units 4, 5, and 6: shutdown due to outage, prior to earthquake

- Operators and other personnel not directly involved in water injection have been evacuated. 40-50 persons have been left onsite to mitigate accident.
- Unit 5 diesel generator is providing power to cool Unit 5 and Unit 6 spent fuel pool.

TEPCO is working to restore site power and anticipates restoration to Units 2, 5, and 6 today and Units 1, 3, and 4 tomorrow.

Five portable pumps have arrived at the Daiichi site and additional equipment to connect the pumps is being coordinated.

DOE Aerial Measurement Teams have completed fly-over of the Daiichi site. Awaiting results.

Unit 1

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- As of 2200 JST (0900 EDT) on March 14, it is reported that sea water is being injected with reported stable cooling
- Containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- The spent fuel pool level is unknown
- Radiation levels 750-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate. (Site gate is same for each unit.)
- Core cooling is via the core spray header.

Unit 2

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Reactor Core Isolation Cooling (RCIC) has failed
- Hydrogen explosion from overheated fuel-water reaction damaged the reactor building
- Secondary containment: Cut hole in the side of the reactor building superstructure to reduce likelihood of hydrogen gas buildup
- Sea water injection restarted with core cooling reported as not stable

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Earthquake/Tsunami Status Update March 17, 2011

0700 EDT

- Primary containment is intact.
- Radiation levels 150-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate. (Site gate is same for each unit.)
- The spent fuel pool level is unknown. Some water is available as evidenced by steam emanating from hole.

Unit 3

- Core damage due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Sea water is being injected with reported stable cooling
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- Primary containment described as "functional"
- The spent fuel pool level is possibly drained – some evidence of steam.
- Radiation levels 150-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate. (Site gate is same for each unit.)
- Unit 3 is currently TEPCO's priority (unclear whether reactor or spent fuel pool)
- Water cannon should be onsite soon (as of 0400 EDT)

Unit 4

- Unit was in a refueling outage at the time of the event and core was off loaded to the spent fuel pool
- First fire in the reactor building was a small generator lube oil fire. IAEA reports that fire was put out at 2200 EDT, March 14.
- Radiation levels 150-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate. (Site gate is same for each unit.)
- Second fire began at 1645 EDT, March 15, 2011 in reactor building. Reports indicate that this fire is not yet contained. Fuel reported to be uncovered.
- Radiation level outside Unit 4 reported to be 30R/hour following second fire.
- High radiation dose rates measured between Units 3 and 4, source is suspected to be the Unit 4 spent fuel pool.
- The spent fuel pool's ability to retain water is in doubt, no steam – likely dry.

Unit 5

- The reactor is defueled.
- IAEA Reports Temperature of pool at 64.5 degrees C at 1500 EDT, March 16, 2011.
- Unit 5 diesel generator is providing power to cool Units 5 and 6 spent fuel pools.

Unit 6

- The reactor is defueled.
- IAEA Reports Temperature of pool at 61.0 degrees C at 1300 EDT, March 16, 2011.
- Power to cool the Unit 6 spent fuel pool is being provided by the Unit 5 diesel generator.

Fukushima Daini

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary. As of 1510 EST, March 12, 2011, an estimated 30,000 people have been evacuated. Full evacuation is not complete. As of 1830 EDT on March 15, 2011, there have not been updates to this information. The Daini units have AC power, and were previously reported to have lost their ultimate heat sink.

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0700 EDT

Unit 1-4

- All units have stable offsite power
- All units are reported to be in cold shutdown with stable water level
- Latest TEPCO reports do not mention any problem with the ultimate heat sink

Onagawa

At 2145 CET, March 13, 2011, IAEA reported that Japanese authorities had informed it that radioactivity levels at the site boundary of the Onagawa Nuclear Power Plant have returned to normal background levels.

Unit 1-3

- All units are shutdown and stable
- The fire in the turbine building has been extinguished

Rokkasho

Earthquake cut off power supply, but diesel generators were immediately connected. Some water spilled from spent fuel pool – liquid was drained and appropriately recovered in liquid waste treatment system. Power supplies are restored to commercial electricity. All units operating.

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A RASCAL run at 0654 EDT on March 16, 2011 for hypothetical combined core based on the following assumptions: Units 2 & 3 each, 33% core melt & no containment; Unit 4, full core offload 100% melt in the Spent Fuel Pool (SFP) with no roof; wind direction from West Northwest blowing out to the ocean. Results: PAG exceeded at 50 miles (80.5 km) with TEDE of 24.0 rem, and CDE thyroid of 130 rem.

NRC PMT discussion with DOE NIT and NARAC requested expedited AMS flyover data of deposition near site to provide better characterization of source term. Information is expected by approximately 5am EDT.

Wind shift over land not expected until Sunday.

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Reference

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1 rem = 0.01 Sv = 10 mSv

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USNRC Emergency Operations Center Status Update

March 17, 2011
Earthquake / Tsunami Status Update
Compiled by Executive Briefing Team

**Caution – This information may be dated and is subject to constant change.
Changes/Additions from previous updates are underlined**

USNRC Status

At 0946 EST, March 11, 2011, the NRC entered Monitoring Mode and the agency continues to monitor the unfolding events in Japan. The Headquarters Operations Center is staffed.

A total of 11 NRC experts supporting USAID response efforts from the NRC are in Japan and have engaged with the US Ambassador's staff.

At 0550 EDT, March 14, 2011, the NRC experts in Japan reported that the Japanese have requested US technical assistance with cooling the Fukushima Daiichi Units 1, 2, and 3. The effort is being coordinated by the US Ambassador. At 0900 EDT, March 15, 2011, the Japanese government accepted DOE's Radiological Assistance Program (RAP) team assistance, which includes Aerial Measuring System (AMS) fly-overs.

NRC provided the White House with information on protective measures for NRC staff in Japan and information to provide advice for other federal workers in Japan. The current protective action recommendation for U.S. citizens residing within 50 miles (80 km) of the Fukushima Daiichi site is to evacuate.

The US State Department has approved voluntary authorized departure for US Government employees at the Embassy in Japan.

NRC has issued numerous press releases related to the earthquake and tsunami. These press releases can be found online at: <http://www.nrc.gov/reading-rm/doc-collections/news/2011/>

Status of NRC Licensee and Agreement State Facilities

At this time, NRC is discontinuing reporting status of NRC licensee and Agreement State facilities. NRC will resume this reporting should any issues arise related to earthquake or tsunami effects.

The Institute of Nuclear Power Operations (INPO) issued a Level 1 Event Report (highest level) to its members on the afternoon of March 15, 2011. It identifies 4 actions, with due dates, and requires a written response. In general, the actions include walkdowns and verifications of aspects of facility capabilities to address B.5.b equipment and procedures, Severe Accident Management Guidelines (SAMGs), mitigation of station blackout (SBO) conditions, mitigation of

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0600 EDT

internal and external flooding, and fire and flooding events that could be impacted by a concurrent seismic event.

The Nuclear Energy Institute (NEI) issued two fact sheets on March 16, 2011: "Industry Taking Action to Ensure Continued Safety at U.S. Nuclear Energy Plants" and "Used Nuclear Fuel Storage at the Fukushima Daiichi Nuclear Power Plant."

Status of Japanese Facilities

(This information is compiled from available sources, including press releases by the Tokyo Electric Power Company (TEPCO) and information from the International Atomic Energy Agency (IAEA)).

IAEA reports that at 1331 UTC on March 15, 2011 a 6.1 magnitude earthquake occurred in eastern Honshu, approximately 100 km from the Hamaoka nuclear power plant. Operational units at the plant remain in safe status after the earthquake.

Background:

There are 14 operational Boiling Water Reactors (BWRs) proximal to the earthquake zone (6 at Fukushima Daiichi, 4 at Fukushima Daini, 3 at Onagawa, and 1 at Tokai)

Current Understanding of Japanese Reactor Status

(This information is compiled from TEPCO press releases and IAEA information releases.)

Fukushima Daiichi

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary and sheltering in place out to 30 km for residents who stayed behind. As of March 12, a 10 km complete radius evacuation has been ordered for the public. IAEA confirms a no-fly zone out to 30 km around the Fukushima Daiichi plant. As of 1830 EDT on March 15, 2011, there have been no updates to protective actions.

Japanese authorities classified the event at a Level 4 "Accident with Local Consequences" on the International Nuclear and Radiological Event Scale (INES) based on radioactive dose measurements at the site boundary exceeding limit values.

Federation of Electric Power Companies of Japan (FEPC) reported at 1015 EST, March 16, 2011:

- Dose rate at main gate (monitoring station 6) ranged from 150 mr/hr to 1000 mr/hr.
- 10 Rem/hr west of Unit 3 and 4 (assuming on roadway next to reactor buildings)
- 30 Rem/hr between Units 2 and 3
- 40 Rem/hr between Units 3 and 4

NHK media report on March 17, 0100 EDT stated that helicopter crews dumping water on Unit 3 reactor building reported dose rates at 375 R/hr at 300 ft. above the building.

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0600 EDT

- Offsite dose measured in Tokai on the coast 100 km NE of Tokyo on March 14 at 1845 EDT was 5 uSv/hr.
- On March 14, NISA reported 160 people were exposed to radiation around the Fukushima nuclear power plant. 170,000 people have been evacuated.
- A no-fly zone was implemented 30 km from the site from zero to unlimited altitude. Source from DOE NIT who talked with FAA.
- On March 16, DTRA data is from 165 miles SSW from the site.

All available information indicates that the majority of releases from the Fukushima site have been carried out to sea by the prevailing winds. Forecast meteorological data for the 24 hour period (until 1200 EDT on March 17, 2011) indicates wind headed offshore (from NW).

Units 1, 2, and 3: shutdown due to earthquake

- At approximately 1000 EDT, March 14, 2011, Unit 2 core was again uncovered.

Units 4, 5, and 6: shutdown due to outage, prior to earthquake

- Operators and other personnel not directly involved in water injection have been evacuated. 40-50 persons have been left onsite to mitigate accident.
- Unit 5 diesel generator is providing power to cool Unit 5 and Unit 6 spent fuel pool.

TEPCO is working to restore site power and anticipates restoration to Units 2, 5, and 6 today and Units 1, 3, and 4 tomorrow.

Five portable pumps have arrived at the Daiichi site and additional equipment to connect the pumps is being coordinated.

DOE Aerial Measurement Teams have completed flyover of the Daiichi site. Awaiting results.

Unit 1

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- As of 2200 JST (0900 EDT) on March 14, it is reported that sea water is being injected with reported stable cooling
- Containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- The spent fuel pool level is unknown
- Radiation levels 150-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate.
(Site gate is same for each unit.)
- Core cooling is via the core spray header.

Unit 2

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Reactor Core Isolation Cooling (RCIC) has failed
- Hydrogen explosion from overheated fuel-water reaction damaged the reactor building
- Secondary containment: Cut hole in the side of the reactor building superstructure to reduce likelihood of hydrogen gas buildup
- Sea water injection restarted with core cooling reported as not stable

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- Primary containment is intact.
- Radiation levels 150-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate. (Site gate is same for each unit.)
- The spent fuel pool level is unknown. Some water is available as evidenced by steam emanating from hole.

Unit 3

- Core damage due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Sea water is being injected with reported stable cooling
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- Primary containment described as "functional"
- The spent fuel pool level is possibly drained – some evidence of steam
- Radiation levels 150-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate. (Site gate is same for each unit.)
- Unit 3 is currently TEPCO's priority (unclear whether reactor or spent fuel pool)
- Water cannon should be onsite soon (as of 0400 EDT)

Unit 4

- Unit was in a refueling outage at the time of the event and core was off loaded to the spent fuel pool
- First fire in the reactor building was a small generator lube oil fire. IAEA reports that fire was put out at 2200 EDT, March 14.
- Radiation levels 150-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate. (Site gate is same for each unit.)
- Second fire began at 1645 EDT, March 15, 2011 in reactor building. Reports indicate that this fire is not yet contained. Fuel reported to be uncovered.
- Radiation level outside Unit 4 reported to be 30R/hour following second fire.
- High radiation dose rates measured between Units 3 and 4, source is suspected to be the Unit 4 spent fuel pool
- The spent fuel pool's ability to retain water is in doubt, no steam – likely dry.

Unit 5

- The reactor is defueled.
- IAEA Reports Temperature of pool at 64.5 degrees C at 1500 EDT, March 16, 2011.
- Unit 5 diesel generator is providing power to cool Units 5 and 6 spent fuel pools.

Unit 6

- The reactor is defueled.
- IAEA Reports Temperature of pool at 61.0 degrees C at 1300 EDT, March 16, 2011.
- Power to cool the Unit 6 spent fuel pool is being provided by the Unit 5 diesel generator.

Fukushima Daini

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary. As of 1510 EST, March 12, 2011, an estimated 30,000 people have been evacuated. Full evacuation is not complete. As of 1830 EDT on March 15, 2011, there have not been updates to this information. The Daini units have AC power, and were previously reported to have lost their ultimate heat sink.

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Earthquake/Tsunami Status Update March 17, 2011

0600 EDT

Unit 1-4

- All units have stable offsite power
- All units are reported to be in cold shutdown with stable water level
- Latest TEPCO reports do not mention any problem with the ultimate heat sink

Onagawa

At 2145 CET, March 13, 2011, IAEA reported that Japanese authorities had informed it that radioactivity levels at the site boundary of the Onagawa Nuclear Power Plant have returned to normal background levels.

Unit 1-3

- All units are shutdown and stable
- The fire in the turbine building has been extinguished

Rokkasho

Earthquake cut off power supply, but diesel generators were immediately connected. Some water spilled from spent fuel pool – liquid was drained and appropriately recovered in liquid waste treatment system. Power supplies are restored to commercial electricity. All units operating.

NRC Evaluation of Radiation Measurements from the USS Ronald Reagan and USS George Washington

On the morning of March 13, 2011, Naval Reactors notified the NRC that dose rates were being measured from the flight deck of the USS Reagan that was ~130 nautical miles off the Japanese coast. Dose rates from the overhead "plume" were approximately 0.6 mrem/hour gamma with no measurable activity on the ship surfaces. The NRC had received an IAEA report showing dose rates of 100 mrem/hour up wind at the site boundary measured ~ 20 hours earlier and press reports for the previous day of plant venting. Given the meteorological conditions, wind speed of 3.5 mph and the calm 'Class D and E' weather stability for the 20-24 hour time period, a plume with low dose rates from the venting is credible at this location.

NRC staff believes that US Naval readings are not inconsistent based on reports and shine dose measurements received from Japanese officials during venting from Fukushima Daiichi Units 1, 2, and 3.

The Navy sent the contamination samples to a base in Japan to perform an isotopic analysis to determine the actual radionuclides. The principle radionuclides identified were iodine, cesium, and technetium, consistent with a release from a nuclear reactor.

The US 7th Fleet has repositioned its ships out of the downwind plume direction from the Fukushima Daiichi Nuclear Power Plant after detecting low level contamination in the air and on its aircraft operating in the area.

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Earthquake/Tsunami Status Update March 17, 2011 0600 EDT
The US Navy identified radiological data from the USS George Washington located at Yokosuka Base at 0300 EDT on March 15, 2011, that showed an air sample of 7E-9 $\mu\text{Ci/mL}$, from which the Navy estimated a dose rate of 1.5 mrem/hour.

Reactor Safety Team Worst Case Analysis

Hypothetical Worst Case Daiichi Units 1, 2 and 3 Accident Sequence Based on our Knowledge of Current Plant Conditions

In this hypothetical event in which no cooling water is added to the core, the water level in the core will decrease, exposing the top of the core to a steam environment and a subsequent heat-up of the fuel rods. As the water continues to boil and recede toward the core bottom, the heat-up rate of the rods will increase rapidly resulting in fuel cladding failure and melt. With the continued lack of cooling water, the melting rods will relocate toward the bottom of the core and eventually into the lower plenum of the reactor vessel. Molten fuel and core debris entering the lower plenum will then cause the lower plenum liquid to boil. If cooling water is added to the drywell to a level above the top elevation of the lower plenum, lower head failure can be prevented. With no cooling water added to the drywell, the lower head will fail by creep rupture allowing molten fuel to enter the drywell. Moreover, the absence of cooling water to the drywell could also result in a containment failure. With cooling water added to the drywell, however, a containment venting capability is also needed to preclude failure from over-pressurization. A containment failure will result in a large radioactive release to the environment.

Please note that failure to add water to the core and drywell is a hypothetical worst case event that will result in containment failure and radioactive release to the environment.

Protective Measures Team (PMT) Worst Case Analysis

A RASCAL run at 0654 EDT on March 16, 2011 for hypothetical combined core based on the following assumptions: Units 2 & 3 each, 33% core melt & no containment; Unit 4, full core offload 100% melt in the Spent Fuel Pool (SFP) with no roof; wind direction from West Northwest blowing out to the ocean. Results: PAG exceeded at 50 miles (80.5 km) with TEDE of 24.0 rem, and CDE thyroid of 130 rem.

NRC PMT discussion with DOE NIT and NARAC requested expedited AMS flyover data of deposition near site to provide better characterization of source term. Information is expected by approximately 5am EDT.

Wind shift over land not expected until Sunday.

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1900 EDT

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Japanese authorities classified the event at a Level 4 "Accident with Local Consequences" on the International Nuclear and Radiological Event Scale (INES) based on radioactive dose measurements at the site boundary exceeding limit values.

IAEA reported at 1340 EDT March 15, 2011:

- Highest reading at fence was 60 mrem/hour at 0200 EDT
- Reduction of dose rates after the peak at 2122 EDT, March 14 (400 mSv/hr in area surrounding Units 3)
- 30 mSv/hr between Units 2 & 3, and 100 mSv/hr surrounding Unit 4
- 2257 EDT, March 15: dose info came in from DTRA. GIS will figure out locations.
- Offsite dose measured in Tokai on the coast 100 km NE of Tokyo on March 14 at 1845 EDT was 5 uSv/hr.

On March 14, NISA reported 160 people were exposed to radiation around the Fukushima nuclear power plant. 170,000 people have been evacuated.

A no-fly zone was implemented 30 km from the site from zero to unlimited altitude.

Source from DOE NIT who talked with FAA.

- On March 16, DTRA data is from 165 miles SSW from the site.

Earthquake/Tsunami Status Update March 16, 2011

1900 EDT

All available information indicates that the majority of releases from the Fukushima site have been carried out to sea by the prevailing winds. Forecast meteorological data for the 24 hour period (until 1200 EDT on March 17, 2011) indicates wind remaining toward offshore (N, NW).

Units 1, 2, and 3: shutdown due to earthquake

- At approximately 1000 EDT, March 14, 2011, Unit 2 core was again uncovered.

Units 4, 5, and 6: shutdown due to outage, prior to earthquake

- All Units: all AC power on-site lost.
- Operators and other personnel not directly involved in water injection have been evacuated. 40-50 persons have been left onsite to mitigate accident.

Unit 1

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- As of 2200 JST (0900 EDT) on March 14, it is reported that sea water is being injected with reported stable cooling
- Containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- The spent fuel pool level is unknown
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

Unit 2

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Reactor Core Isolation Cooling (RCIC) has failed
- Hydrogen explosion from overheated fuel-water reaction damaged the reactor building
- Secondary containment: Cut hole to reduce likelihood of hydrogen gas buildup
- Sea water injection restarted with core cooling reported as not stable
- Primary containment is intact.
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)
- The spent fuel pool level is unknown. Some water is available as evidenced by steam emanating from hole.

Unit 3

- Core damage due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Sea water is being injected with reported stable cooling
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- Primary containment described as "functional"
- The spent fuel pool level is possibly drained – some evidence of steam.
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

Unit 4

- First fire in the reactor building was a small generator lube oil fire. IAEA reports that fire was put out at 2200 EDT, March 14.
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)
- Second fire began at 1645 EDT, March 15, 2011 in reactor building. Reports indicate that this fire is not yet contained. Fuel reported to be uncovered.
- Radiation level outside Unit 4 reported to be 30R/hour following second fire.
- High radiation dose rates measured between Units 3 and 4, source is suspected to be the partially uncovered Unit 4 spent fuel pool.
- The spent fuel pool's ability to retain water is in doubt, no steam – likely dry.

Unit 5

- The reactor is defueled.
- Spent fuel pool is reported to be heating up.
- A/C power available from Unit 6 diesel generator.

Unit 6

- The reactor is defueled.
- Spent fuel pool is reported to be heating up.
- A/C power available from diesel generator.

Fukushima Daini

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary. As of 1510 EST, March 12, 2011, an estimated 30,000 people have been evacuated. Full evacuation is not complete. As of 1830 EDT on March 15, 2011, there have not been updates to this information. The Daini units have AC power, and were previously reported to have lost their ultimate heat sink.

Unit 1-4

- All units have stable offsite power
- All units are reported to be in cold shutdown with stable water level
- Latest TEPCO reports do not mention any problem with the ultimate heat sink

Onagawa

At 2145 CET, March 13, 2011, IAEA reported that Japanese authorities had informed it that radiation levels at the site boundary of the Onagawa Nuclear Power Plant have returned to normal background levels.

Unit 1-3

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On the morning of March 13, 2011, Naval Reactors notified the NRC that dose rates were being measured from the flight deck of the USS Reagan that was ~130 nautical miles off the Japanese coast. Dose rates from the overhead "plume" were approximately 0.6 mrem/hour gamma with no measurable activity on the ship surfaces. The NRC had received an IAEA report showing dose rates of 100 mrem/hour up wind at the site boundary measured ~ 20 hours earlier and press reports for the previous day of plant venting. Given the meteorological conditions, wind speed of 3-5 mph and the calm 'Class D and E' weather stability for the 20-24 hour time period, a plume with low dose rates from the venting is credible at this location.

NRC staff believes that US Naval readings are not inconsistent based on reports and ship dose measurements received from Japanese officials during venting from Fukushima Daiichi Units 1, 2, and 3.

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5 of 7

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Earthquake/Tsunami Status Update March 16, 2011

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1 rem = 0.01 Sv = 10 mSv

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RST Plant
Status

Japan Earthquake and Tsunami
Daiichi

Daiichi Unit 1 (Shutdown)

Core Damage Yes
Rad Release Yes
Sea Water inject RPV
Pri Ctmt intact (poss RCS
breach (GE))
Sec Ctmt lost
SFP Status - no reported
problems

Daiichi Unit 2 (Shutdown)

Core Damage - Yes
Rad release-Yes
Sea Water Inject RPV
Pri Cmct- Believed intact
(Ulses 0640 3/15)(poss RCS
breach (GE))
Sec Ctmt lost
SFP Status - ??

Daiichi Unit 3 (Shutdown)

Core Damage - Yes
Rad release Yes
Sea Water inject RPV
Pri Ctmt intact (poss RCS
breach (GE))
Sec Ctmt lost
SFP Status - no reported
problems

Status

Site Evacuation to 20 km

Critical Safety Functions

Current **03/16/2011** ⁺¹⁻²
04:59:56 (ET) _{Hours}
Core Cooling &
Heat Removal
Containment
Temperature &
Pressure
Control
RCS & Reactor
Vessel Integrity
Availability of AC
Power
Rad.
Confinement &
Mitigation
Reactor
Shutdown /
Criticality

Licensee Event Classification

Daiichi Unit 4 (S/D
11/30/10)
Core unloaded to SFP
Rad release - possible from
SFP

Sheltering out to 30 km
Fire in Unit 4 was a RB lube
oil fire (fire reported out)
Unit 4 spent fuel in pool for
105 days (GEH)

Water inject to SFP - ?
Sec Ctmt lost
5 - S/D 1/3/11
6 - S/D 8/14/10

Looking Forward:

Flood Drywell U1, 2, 3
Better/Stable DC?
Mobile Diesel Generator
Status?
SFP status including
common SFP ??
4 diesel pumps from DTRA
heading to Daiichi

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NRC provided the White House with information on protective measures for NRC staff in Japan, being able to provide advice for other federal workers in Japan, and that U.S. citizens in Japan should follow advice of the government of Japan.

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IAEA reports that at 1331 UTC on March 15, 2011 a 6.1 magnitude earthquake occurred in eastern Honshu, approximately 100 km from the Hamaoka nuclear power plant. Operational units at the plant remain in safe status after the earthquake.

Background:

There are 14 operational Boiling Water Reactors (BWRs) proximal to the earthquake zone (6 at Fukushima Daiichi, 4 at Fukushima Daini, 3 at Onagawa, and 1 at Tokai)

Current Understanding of Japanese Reactor Status

(This information is compiled from TEPCO press releases and IAEA information releases.)

Fukushima Daiichi

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary and sheltering in place out to 30 km for residents who stayed behind. As of March 12, a 10 km complete radius evacuation has been ordered for the public. IAEA confirms a no-fly zone out to 30 km around the Fukushima Daiichi plant. As of 1830 EDT on March 15, 2011, there have been no updates to protective actions.

Japanese authorities classified the event at a Level 4 "Accident with Local Consequences" on the International Nuclear and Radiological Event Scale (INES) based on radioactive dose measurements at the site boundary exceeding limit values.

IAEA reported at 1340 EDT, March 15, 2011.

- Highest reading at fence was 60 mrem/hour at 0200 EDT
- Reduction of dose rates after the peak at 2122 EDT, March 14 (400 mSv/hr in area surrounding Unit 3)
- 30 mSv/hr between Units 2 & 3, and 100 mSv/hr surrounding Unit 4
- 2227 EDT, March 15 dose info came in from DTRA. GIS will figure out locations.
- Offsite dose measured in Tokai on the coast 100 km NE of Tokyo on March 14 at 1845 EDT was 5 uSv/hr
- On March 14, NISA reported 160 people were exposed to radiation around the Fukushima nuclear power plant. 170,000 people have been evacuated.
- A no-fly zone was implemented 30 km from the site from zero to unlimited altitude. Source from DOE NIT who talked with FAA.
- On March 16, DITRA data is from 165 miles SSW from the site.

Available information indicates that the majority of releases from the Fukushima site have been carried out to sea by the prevailing winds. Forecast meteorological data for the 24 hour period (until 1700 EDT on March 16, 2011) indicates wind remaining toward offshore (N, NW).

Units 1, 2, and 3: shutdown due to earthquake

- At approximately 1000 EDT, March 14, 2011, Unit 2 core was again uncovered.

Units 4, 5, and 6: shutdown due to outage, prior to earthquake

- All Units: all AC power on-site lost.
- Operators and other personnel not directly involved in water injection have been evacuated. 40-50 persons have been left onsite to mitigate accident.

Unit 1

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- As of 2200 JST (0900 EDT) on March 14, it is reported that sea water is being injected with reported stable cooling
- Containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- The spent fuel pool level is unknown
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

Unit 2

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Reactor Core Isolation Cooling (RCIC) has failed
- Hydrogen explosion from overheated fuel-water reaction damaged the reactor building
- Secondary containment: Cut hole to reduce likelihood of hydrogen gas buildup
- Sea water injection restarted with core cooling reported as not stable
- There are reports of a loud sound at Unit 2 in the vicinity of the suppression chamber. It was reported at 0730 EDT on March 15, 2011 that containment is intact (better than previously thought).
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)
- The spent fuel pool level is unknown. Possibility of steam/smoke from water boil-off or zirc-water reaction.

Unit 3

- Core damage due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Sea water is being injected with reported stable cooling
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- Primary containment described as "functional"
- The spent fuel pool level is unknown. Possibility of steam/smoke from water boil-off or zirc-water reaction.
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

Unit 4

- First fire in the reactor building was a small generator lube oil fire. IAEA reports that fire was put out at 2200 EDT, March 14.

- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)
- Second fire began at 1645 EDT, March 15, 2011 in reactor building. Reports indicate that this fire is not yet contained. Fuel reported to be uncovered.
- Radiation level outside Unit 4 reported to be 30R/hour following second fire.
- High radiation dose rates measured between Units 3 and 4, source is suspected to be the partially uncovered Unit 4 spent fuel pool.
- The spent fuel pool's ability to retain water is in doubt.
- Explosion (likely hydrogen) in Unit 4 due to uncovered fuel in the spent fuel pool (awaiting visual confirmation).

Unit 5

- The reactor is stable.
- Spent fuel pool is reported to be heating up.
- IAEA reports that water level in was down 40 cm in 5 hours since 0800 EDT, March 15, 2011. It is not clear if this is the RPV or SFP water level. TEPCO plans to use operational diesel generator at Unit 6 to provide water to Unit 5.

Unit 6

- The reactor is stable.
- Spent fuel pool is reported to be heating up.

Fukushima Daini

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary. As of 1510 EST, March 12, 2011, an estimated 30,000 people have been evacuated. Full evacuation is not complete. As of 1830 EDT on March 15, 2011, there have not been updates to this information. The Daini units have AC power, and were previously reported to have lost their ultimate heat sink.

Unit 1-4

- All units have stable offsite power
- All units are reported to be in cold shutdown with stable water level
- Latest TEPCO reports do not mention any problem with the ultimate heat sink

Onagawa

At 2145 CET, March 13, 2011, IAEA reported that Japanese authorities had informed it that radioactivity levels at the site boundary of the Onagawa Nuclear Power Plant have returned to normal background levels.

Unit 1-3

- All units are shutdown and stable
- The fire in the turbine building has been extinguished

NRC Evaluation of Radiation Measurements from the USS Ronald Reagan and USS George Washington

On the morning of March 13, 2011, Naval Reactors notified the NRC that dose rates were being measured from the flight deck of the USS Reagan that was ~130 nautical miles off the Japanese coast. Dose rates from the overhead "plume" were approximately 0.6 mrem/hour gamma with no measurable activity on the ship surfaces. The NRC had received an IAEA report showing dose rates of 100 mrem/hour up wind at the site boundary measured ~ 20 hours earlier and press reports for the previous day of plant venting. Given the meteorological conditions, wind speed of 3-5 mph and the calm 'Class D and E' weather stability for the 20-24 hour time period, a plume with low dose rates from the venting is credible at this location.

NRC staff believes that US Naval readings are not inconsistent based on reports and shine dose measurements received from Japanese officials during venting from Fukushima Daiichi Units 1, 2, and 3.

The Navy sent the contamination samples to a base in Japan to perform an isotopic analysis to determine the actual radionuclides. The principle radionuclides identified were iodine, cesium, and technetium, consistent with a release from a nuclear reactor.

The US 7th Fleet has repositioned its ships out of the downwind plume direction from the Fukushima Daiichi Nuclear Power Plant after detecting low level contamination in the air and on its aircraft operating in the area.

The US Navy identified radiological data from the USS George Washington located at Yokosuka Base at 0300 EDT on March 15, 2011, that showed an air sample of 7E-9 uCi/mL, from which the Navy estimated a dose rate of 1.5 mrem/hour.

Reactor Safety Team Worst Case Analysis

Hypothetical Worst Case Daiichi Units 1, 2 and 3 Accident Sequence Based on our Knowledge of Current Plant Conditions

In this hypothetical event in which no cooling water is added to the core, the water level in the core will decrease, exposing the top of the core to a steam environment and a subsequent heat-up of the fuel rods. As the water continues to boil and recede toward the core bottom, the heat-up rate of the rods will increase rapidly resulting in fuel cladding failure and melt. With the continued lack of cooling water, the melting rods will relocate toward the bottom of the core and eventually into the lower plenum of the reactor vessel. Molten fuel and core debris entering the lower plenum will then cause the lower plenum liquid to boil. If cooling water is added to the drywell to a level above the top elevation of the lower plenum, lower head failure can be prevented. With no cooling water added to the drywell, the lower head will fail by creep rupture allowing molten fuel to enter the drywell. Moreover, the absence of cooling water to the drywell

could also result in a containment failure. With cooling water added to the drywell, however, a containment venting capability is also needed to preclude failure from over-pressurization. A containment failure will result in a large radioactive release to the environment.

Please note that failure to add water to the core and drywell is a hypothetical worst case event that will result in containment failure and radioactive release to the environment.

Protective Measures Team (PMT) Worst Case Analysis

A RASCAL run at 06:54AM (EDT) on March 16, 2011 for hypothetical combined core based on the following assumptions: Units 2 & 3 each, 33% core melt & no containment; Unit 4, full core offload 100% melt in the Spent Fuel Pool (SFP) with no roof; wind direction from West Northwest blowing out to the ocean. Results: PAG exceeded at 50 miles (80.5 km) with TEDE of 24.0 rem, and CDE thyroid of 130 rem.

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Reference

Units

1 rem (rem) = 1,000 millirem (mrem)

1 Sievert (Sv) = 1,000 milliSieverts (mSv) = 1,000,000 microsieverts (μ Sv)

1 rem = 0.01 Sv = 10 mSv

NOT FOR PUBLIC DISCLOSURE

USNRC Emergency Operations Center Status Update

March 15, 2011
Earthquake / Tsunami Status Update
Compiled by Executive Briefing Team

Caution – This information may be dated and is subject to constant change.
Changes/Additions from previous updates are underlined

USNRC Status

At 0946 EST, March 11, 2011, the NRC entered Monitoring Mode and the agency continues to monitor the unfolding events in Japan. The Headquarters Operations Center is staffed.

A total of 11 NRC experts supporting USAID response efforts from the NRC are in Japan and have engaged with the US Ambassador's staff.

At 0550 EDT, March 14, 2011, the NRC experts in Japan reported that the Japanese have requested US technical assistance with cooling the Fukushima Daiichi Units 1, 2, and 3. The effort is being coordinated by the US Ambassador. At 0908 EDT, March 15, 2011, the Japanese government accepted DOE's Radiological Assistance Program (RAP) team assistance, which includes Aerial Measuring System (AMS) fly-overs.

NRC provided the White House with information on protective measures for NRC staff in Japan, being able to provide advice for other federal workers in Japan, and that U.S. citizens in Japan should follow advice of the government of Japan.

NRC has issued numerous press releases related to the earthquake and tsunami. These press releases can be found online at: <http://www.nrc.gov/reading-rm/doc-collections/news/2011/>

Status of NRC Licensee and Agreement State Facilities

At this time, NRC is discontinuing reporting status of NRC licensee and Agreement State facilities. NRC will resume this reporting should any issues arise related to earthquake or tsunami effects.

The Institute of Nuclear Power Operations (INPO) issued a Level 1 Event Report (highest level) to its members this afternoon. It identifies 4 actions, with due dates, and requires a written response. In general, the actions include walkdowns and verifications of aspects of facility capabilities to address B.5.b equipment and procedures, Severe Accident Management Guidelines (SAMGs), mitigation of station blackout (SBO) conditions, mitigation of internal and external flooding, and fire and flooding events that could be impacted by a concurrent seismic event.

Earthquake/Tsunami Status Update March 16, 2011

0630 EDT

Status of Japanese Facilities

(This information is compiled from available sources, including press releases by the Tokyo Electric Power Company (TEPCO) and information from the International Atomic Energy Agency (IAEA)).

IAEA reports that at 1331 UTC on March 15, 2011 a 6.1 magnitude earthquake occurred in eastern Honshu, approximately 100 km from the Hamaoka nuclear power plant. Operational units at the plant remain in safe status after the earthquake.

Background:

There are 14 operational Boiling Water Reactors (BWRs) proximal to the earthquake zone (6 at Fukushima Daiichi, 4 at Fukushima Daini, 3 at Onagawa, and 1 at Tokai)

Current Understanding of Japanese Reactor Status

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Fukushima Daiichi

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary and sheltering in place out to 30 km for residents who stayed behind. As of March 12, a 10 km complete radius evacuation has been ordered for the public. IAEA confirms a no-fly zone out to 30 km around the Fukushima Daiichi plant. As of 1830 EDT on March 15, 2011, there have been no updates to protective actions.

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All available information indicates that the majority of releases from the Fukushima site have been carried out to sea by the prevailing winds. Forecast meteorological data for the 24 hour period (until 1700 EDT on March 16, 2011) indicates wind remaining toward offshore (N, NW).

Units 1, 2, and 3: shutdown due to earthquake

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Earthquake/Tsunami Status Update March 16, 2011

0630 EDT

Units 4, 5, and 6: shutdown due to outage, prior to earthquake

- All Units: all AC power on-site lost.
- Operators and other personnel not directly involved in water injection have been evacuated. 40-50 persons have been left onsite to mitigate accident.

Unit 1

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- As of 2200 JST (0900 EDT) on March 14, it is reported that sea water is being injected with reported stable cooling
- Containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- The spent fuel pool level is decreasing
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

Unit 2

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Reactor Core Isolation Cooling (RCIC) has failed
- Hydrogen explosion from overheated fuel-water reaction damaged the reactor building
- Secondary containment: Cut hole to reduce likelihood of hydrogen gas buildup
- Sea water injection restarted with core cooling reported as not stable
- There are reports of a loud sound at Unit 2 in the vicinity of the suppression chamber. It was reported at 0730 EDT on March 15, 2011 that containment is intact (better than previously thought).
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)
- The spent fuel pool level is decreasing

Unit 3

- Core damage due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Sea water is being injected with reported stable cooling
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- Primary containment described as "functional"
- The spent fuel level is decreasing, with zirc interaction
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

Unit 4

- First fire in the reactor building was a small generator lube oil fire. IAEA reports that fire was put out at 2200 EDT, March 14.
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

OFFICIAL USE ONLY

Earthquake/Tsunami Status Update March 16, 2011

0630 EDT

- Second fire began at 1645 EDT, March 15, 2011 in reactor building. Reports indicate that this fire is not yet contained. TEPCO is determining whether to use helicopter or fire truck to fight fire. Fuel reported to be uncovered.
- Radiation level inside Unit 4 reported to be 30R/hour following second fire.
- High radiation dose rates measured between Units 3 and 4, source is suspected to be the partially uncovered Unit 4 spent fuel pool.
- There is a total water loss from the spent fuel pool with no ability to retain water in the pool; and zirc interaction taking place
- There are reports of possible hydrogen explosion due to uncovered fuel in the spent fuel pool (awaiting visual confirmation).
- Unconfirmed reports of 30 R/hr at the Unit 4 SFP which is making fire fighting difficult (March 15). Another fire at Unit 4 SFP.

Unit 5

- The reactor is stable.
- Spent fuel pool is reported to be heating up.
- IAEA reports that water level in was down 40 cm in 5 hours since 0800 EDT, March 15, 2011. It is not clear if this is the RPV or SFP water level. TEPCO plans to use operational diesel generator at Unit 6 to provide water to Unit 5.

Unit 6

- The reactor is stable.
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Fukushima Daini

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary. As of 1510 EST, March 12, 2011, an estimated 30,000 people have been evacuated. Full evacuation is not complete. As of 1830 EDT on March 15, 2011, there have not been updates to this information. The Daini units have AC power, and were previously reported to have lost their ultimate heat sink.

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Onagawa

At 2145 EST, March 13, 2011, IAEA reported that Japanese authorities had informed it that radioactivity levels at the site boundary of the Onagawa Nuclear Power Plant have returned to normal background levels.

Unit 3

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- The fire in the turbine building has been extinguished

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On the morning of March 13, 2011, Naval Reactors notified the NRC that dose rates were being measured from the flight deck of the USS Reagan that was ~130 nautical miles off the Japanese coast. Dose rates from the overhead "plume" were approximately 0.6 mrem/hour gamma with no measurable activity on the ship surfaces. The NRC had received an IAEA report showing dose rates of 100 mrem/hour up wind at the site boundary measured ~ 20 hours earlier and press reports for the previous day of plant venting. Given the meteorological conditions, wind speed of 3-5 mph and the calm 'Class D and E' weather stability for the 20-24 hour time period, a plume with low dose rates from the venting is credible at this location.

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RST Plant
Status

Japan Earthquake and Tsunami
Daiichi

Daiichi Unit 1 (Shutdown)

Core Damage Yes
Rad Release Yes
Sea Water inject RPV
Pri Ctmt intact (poss RCS
breach (GE))
Sec Ctmt lost
SFP Status - no reported
problems

Daiichi Unit 2 (Shutdown)

Core Damage - Yes
Rad release-Yes
Sea Water Inject RPV
Pri Cmct- Believed intact
(Ulses 0640 3/15)(poss RCS
breach (GE))
Sec Ctmt lost
SFP Status - ??

Daiichi Unit 3 (Shutdown)

Core Damage - Yes
Rad release Yes
Sea Water inject RPV
Pri Ctmt intact (poss RCS
breach (GE))
Sec Ctmt lost
SFP Status - no reported
problems

Status

Site Evacuation to 20 km

Critical Safety Functions

Current **03/16/2011** **+1-2**
04:59:56 (ET) **Hours**

Core Cooling &
Heat Removal

Containment
Temperature &
Pressure
Control

RCS & Reactor
Vessel Integrity

Availability of AC
Power

Rad.
Confinement &
Mitigation

Reactor
Shutdown /
Criticality

Licensee Event Classification

Daiichi Unit 4 (S/D
11/30/10)

Core unloaded to SFP
Rad release - possible from
SFP

<p>Sheltering out to 30 km Fire in Unit 4 was a RB lube oil fire (fire reported out) Unit 4 spent fuel in pool for 105 days (GEH)</p>	<p>Water inject to SFP - ? Sec Ctmt lost 5 - S/D 1/3/11 6 - S/D 8/14/10</p> <hr/> <p><u>Looking Forward:</u> Flood Drywell U1, 2, 3 Better/Stable DC? Mobile Diesel Generator Status? SFP status including common SFP ?? 4 diesel pumps from DTRA heading to Daiichi</p>
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USNRC Emergency Operations Center Status Update

March 16, 2011
Earthquake / Tsunami Status Update
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NRC provided the White House with information on protective measures for NRC staff in Japan and information to provide advice for other federal workers in Japan. The current protective action recommendation for U.S. citizens residing within 50 miles (80 km) of the Fukushima Daiichi site is to evacuate.

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Earthquake/Tsunami Status Update March 16, 2011

1900 EDT

The Nuclear Energy Institute (NEI) issued two fact sheets on March 16, 2011: "Industry Taking Action to Ensure Continued Safety at U.S. Nuclear Energy Plants" and "Used Nuclear Fuel Storage at the Fukushima Daiichi Nuclear Power Plant."

Status of Japanese Facilities

(This information is compiled from available sources, including press releases by the Tokyo Electric Power Company (TEPCO) and information from the International Atomic Energy Agency (IAEA)).

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Earthquake/Tsunami Status Update March 16, 2011 1900 EDT
All available information indicates that the majority of releases from the Fukushima site have been carried out to sea by the prevailing winds. Forecast meteorological data for the 24 hour period (until 1200 EDT on March 17, 2011) indicates wind remaining toward offshore (N, NW).

Units 1, 2, and 3: shutdown due to earthquake

- At approximately 1000 EDT, March 14, 2011, Unit 2 core was again uncovered.

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- All Units: all AC power on-site lost.
- Operators and other personnel not directly involved in water injection have been evacuated. 40-50 persons have been left onsite to mitigate accident.

Unit 1

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- As of 2200 JST (0900 EDT) on March 14, it is reported that sea water is being injected with reported stable cooling
- Containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- The spent fuel pool level is unknown
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

Unit 2

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Reactor Core Isolation Cooling (RCIC) has failed
- Hydrogen explosion from overheated fuel-water reaction damaged the reactor building
- Secondary containment: Cut hole to reduce likelihood of hydrogen gas buildup
- Sea water injection restarted with core cooling reported as not stable
- Primary containment is intact
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)
- The spent fuel pool level is unknown. Some water is available as evidenced by steam emanating from hole.

Unit 3

- Core damage due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Sea water is being injected with reported stable cooling
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- Primary containment described as "functional"
- The spent fuel pool level is possibly drained – some evidence of steam.
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

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Earthquake/Tsunami Status Update March 16, 2011

1900 EDT

Unit 4

- First fire in the reactor building was a small generator lube oil fire. IAEA reports that fire was put out at 2200 EDT, March 14.
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)
- Second fire began at 1645 EDT, March 15, 2011 in reactor building. Reports indicate that this fire is not yet contained. Fuel reported to be uncovered.
- Radiation level outside Unit 4 reported to be 30R/hour following second fire.
- High radiation dose rates measured between Units 3 and 4, source is suspected to be the partially uncovered Unit 4 spent fuel pool.
- The spent fuel pool's ability to retain water is in doubt, no steam – likely dry.

Unit 5

- The reactor is defueled.
- Spent fuel pool is reported to be heating up.
- A/C power available from Unit 6 diesel generator.

Unit 6

- The reactor is defueled.
- Spent fuel pool is reported to be heating up.
- A/C power available from diesel generator.

Fukushima Daini

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary. As of 1510 EST, March 12, 2011, an estimated 30,000 people have been evacuated. Full evacuation is not complete. As of 1830 EDT on March 15, 2011, there have not been updates to this information. The Daini units have AC power, and were previously reported to have lost their ultimate heat sink.

Unit 1-4

- All units have stable offsite power
- All units are reported to be in cold shutdown with stable water level
- Latest TEPCO reports do not mention any problem with the ultimate heat sink

Onagawa

At 2145 CET, March 13, 2011, IAEA reported that Japanese authorities had informed it that radioactivity levels at the site boundary of the Onagawa Nuclear Power Plant have returned to normal background levels.

Unit 1-3

- All units are shutdown and stable
- The fire in the turbine building has been extinguished

NRC Evaluation of Radiation Measurements from the USS Ronald Reagan and USS George Washington

On the morning of March 13, 2011, Naval Reactors notified the NRC that dose rates were being measured from the flight deck of the USS Reagan that was ~130 nautical miles off the Japanese coast. Dose rates from the overhead "plume" were approximately 0.6 mrem/hour gamma with no measurable activity on the ship surfaces. The NRC had received an IAEA report showing dose rates of 100 mrem/hour up wind at the site boundary measured ~20 hours earlier and press reports for the previous day of plant venting. Given the meteorological conditions, wind speed of 3-5 mph and the calm 'Class D and E' weather stability for the 20-24 hour time period, a plume with low dose rates from the venting is credible at this location.

NRC staff believes that US Naval readings are not inconsistent based on reports and shine dose measurements received from Japanese officials during venting from Fukushima Daiichi Units 1, 2, and 3.

The Navy sent the contamination samples to a base in Japan to perform an isotopic analysis to determine the actual radionuclides. The principle radionuclides identified were iodine, cesium, and technetium, consistent with a release from a nuclear reactor.

The US 7th Fleet has repositioned its ships out of the downwind plume direction from the Fukushima Daiichi Nuclear Power Plant after detecting low level contamination in the air and on its aircraft operating in the area.

The US Navy identified radiological data from the USS George Washington located at Yokosuka Base at 0300 EDT on March 15, 2011, that showed an air sample of 7E-9 $\mu\text{Ci/mL}$, from which the Navy estimated a dose rate of 1.5 mrem/hour.

Reactor Safety Team Worst Case Analysis

Hypothetical Worst Case Daiichi Units 1, 2 and 3 Accident Sequence Based on our Knowledge of Current Plant Conditions

In this hypothetical event, in which no cooling water is added to the core, the water level in the core will decrease, exposing the top of the core to a steam environment and a subsequent heat-up of the fuel rods. As the water continues to boil and recede toward the core bottom, the heat-up rate of the rods will increase rapidly resulting in fuel cladding failure and melt. With the continued lack of cooling water, the melting rods will relocate toward the bottom of the core and eventually into the lower plenum of the reactor vessel. Molten fuel and core debris entering the lower plenum will then cause the lower plenum liquid to boil. If cooling water is added to the drywell to a level above the top elevation of the lower plenum, lower head failure can be prevented. With no cooling water added to the drywell, the lower head will fail by creep rupture allowing molten fuel to enter the drywell. Moreover, the absence of cooling water to the drywell could also result in a containment failure. With cooling water added to the drywell, however, a containment venting capability is also needed to preclude failure from over-pressurization. A containment failure will result in a large radioactive release to the environment.

Earthquake/Tsunami Status Update March 16, 2011

1900 EDT

Please note that failure to add water to the core and drywell is a hypothetical worst case event that will result in containment failure and radioactive release to the environment.

Protective Measures Team (PMT) Worst Case Analysis

A RASCAL run at 0654 EDT on March 16, 2011 for hypothetical combined core based on the following assumptions: Units 2 & 3 each, 33% core melt & no containment; Unit 4, full core offload 100% melt in the Spent Fuel Pool (SFP) with no roof; wind direction from West Northwest blowing out to the ocean. Results: PAG exceeded at 50 miles (80.5 km) with TDE of 24.0 rem, and CDE thyroid of 130 rem.

NOT FOR PUBLIC DISCLOSURE

Reference

Units

1 rem (rem) = 1,000 millirem (mrem)

1 Sievert (Sv) = 1,000 milliSieverts (mSv) = 1,000,000 microsieverts (μ Sv)

1 rem = 0.01 Sv = 10 mSv

NOT FOR PUBLIC DISCLOSURE

RST Plant
Status

Japan Earthquake and Tsunami
Daiichi

Daiichi Unit 1 (Shutdown)

Core Damage Yes
Rad Release Yes
Sea Water inject RPV
Pri Ctmt intact (poss RCS
breach (GE))
Sec Ctmt lost
SFP Status - no reported
problems

Daiichi Unit 2 (Shutdown)

Core Damage - Yes
Rad release-Yes
Sea Water Inject RPV
Pri Cmct- Believed intact
(Ulses 0640 3/15)(poss RCS
breach (GE))
Sec Ctmt lost
SFP Status - ??

Daiichi Unit 3 (Shutdown)

Core Damage - Yes
Rad release Yes
Sea Water inject RPV
Pri Ctmt intact (poss RCS
breach (GE))
Sec Ctmt lost
SFP Status - no reported
problems

Status

Site Evacuation to 20 km

Critical Safety Functions

Current **03/16/2011** +1-2
04:59:56 (ET) Hours
Core Cooling &
Heat Removal
Containment
Temperature &
Pressure
Control
RCS & Reactor
Vessel Integrity
Availability of AC
Power
Rad.
Confinement &
Mitigation
Reactor
Shutdown /
Criticality

Licensee Event Classification

Daiichi Unit 4 (S/D
11/30/10)
Core unloaded to SFP
Rad release - possible from
SFP

Sheltering out to 30 km
Fire in Unit 4 was a RB lube
oil fire (fire reported out)
Unit 4 spent fuel in pool for
105 days (GEH)

Water inject to SFP - ?
Sec Ctmt lost
5 - S/D 1/3/11
6 - S/D 8/14/10

Looking Forward:

Flood Drywell U1, 2, 3
Better/Stable DC?
Mobile Diesel Generator
Status?
SFP status including
common SFP ??
4 diesel pumps from DTRA
heading to Daiichi

NOT FOR PUBLIC DISCLOSURE

USNRC Emergency Operations Center Status Update

March 15, 2011
Earthquake / Tsunami Status Update
Compiled by Executive Briefing Team

**Caution – This information may be dated and is subject to constant change.
Changes/Additions from previous updates are underlined**

USNRC Status

At 0946 EST, March 11, 2011, the NRC entered Monitoring Mode and the agency continues to monitor the unfolding events in Japan. The Headquarters Operations Center is staffed.

A total of 11 NRC experts supporting USAID response efforts from the NRC are in Japan and have engaged with the US Ambassador's staff.

At 0550 EDT, March 14, 2011, the NRC experts in Japan reported that the Japanese have requested US technical assistance with cooling the Fukushima Daiichi Units 1, 2, and 3. The effort is being coordinated by the US Ambassador. At 0900 EDT, March 15, 2011, the Japanese government accepted DOE's Radiological Assistance Program (RAP) team assistance, which includes Aerial Measuring System (AMS) fly-overs.

NRC provided the White House with information on protective measures for NRC staff in Japan, being able to provide advice for other federal workers in Japan, and that U.S. citizens in Japan should follow advice of the government of Japan.

NRC has issued numerous press releases related to the earthquake and tsunami. These press releases can be found online at: <http://www.nrc.gov/reading-rm/doc-collections/news/2011/>

Status of NRC Licensee and Agreement State Facilities

At this time, NRC is discontinuing reporting status of NRC licensee and Agreement State facilities. NRC will resume this reporting should any issues arise related to earthquake or tsunami effects.

The Institute of Nuclear Power Operations (INPO) issued a Level 1 Event Report (highest level) to its members this afternoon. It identifies 4 actions, with due dates, and requires a written response. In general, the actions include walkdowns and verifications of aspects of facility capabilities to address B.5.b equipment and procedures, Severe Accident Management Guidelines (SAMGs), mitigation of station blackout (SBO) conditions, mitigation of internal and external flooding, and fire and flooding events that could be impacted by a concurrent seismic event.

Status of Japanese Facilities

(This information is compiled from available sources, including press releases by the Tokyo Electric Power Company (TEPCO) and information from the International Atomic Energy Agency (IAEA)).

IAEA reports that at 1331 UTC on March 15, 2011 a 6.1 magnitude earthquake occurred in eastern Honshu, approximately 100 km from the Hamaoka nuclear power plant. Operational units at the plant remain in safe status after the earthquake.

Background:

There are 14 operational Boiling Water Reactors (BWRs) proximal to the earthquake zone (6 at Fukushima Daiichi, 4 at Fukushima Daini, 3 at Onagawa, and 1 at Tokai)

Current Understanding of Japanese Reactor Status

(This information is compiled from TEPCO press releases and IAEA information releases.)

Fukushima Daiichi

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary and sheltering in place out to 30 km for residents who stayed behind. As of March 12, a 10 km complete radius evacuation has been ordered for the public. IAEA confirms a no-fly zone out to 30 km around the Fukushima Daiichi plant. As of 1830 EDT on March 15, 2011, there have been no updates to protective actions.

Japanese authorities classified the event at a Level 4 "Accident with Local Consequences" on the International Nuclear and Radiological Event Scale (INES) based on radioactive dose measurements at the site boundary exceeding limit values.

IAEA reported at 1340 EDT, March 15, 2011:

- Highest reading at fence was 60 mrem/hour at 0200 EDT
- Reduction of dose rates after the peak at 2122 EDT, March 14 (400 mSv/hr in area surrounding Unit 3)
- 30 mSv/hr between Units 2 & 3, and 100 mSv/hr surrounding Unit 4
- 2227 EDT, March 15, dose info came in from DTRA. GIS will figure out locations.
- Offsite dose measured in Tokai on the coast 100 km NE of Tokyo on March 14 at 1845 EDT was 5 uSv/hr
- On March 14, NISA reported 160 people were exposed to radiation around the Fukushima nuclear power plant. 170,000 people have been evacuated.
- A no-fly zone was implemented 30 km from the site from zero to unlimited altitude. Source from DOE NIT who talked with FAA.
- On March 16, DITRA data is from 165 miles SSW from the site.

All available information indicates that the majority of releases from the Fukushima site have been carried out to sea by the prevailing winds. Forecast meteorological data for the 24 hour period (until 1700 EDT on March 16, 2011) indicates wind remaining toward offshore (N, NW).

Units 1, 2, and 3: shutdown due to earthquake

- At approximately 1000 EDT, March 14, 2011, Unit 2 core was again uncovered.

Units 4, 5, and 6: shutdown due to outage, prior to earthquake

- All Units: all AC power on-site lost.
- Operators and other personnel not directly involved in water injection have been evacuated. 40-50 persons have been left onsite to mitigate accident.

Unit 1

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- As of 2200 JST (0900 EDT) on March 14, it is reported that sea water is being injected with reported stable cooling
- Containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- The spent fuel pool level is unknown
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

Unit 2

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Reactor Core Isolation Cooling (RCIC) has failed
- Hydrogen explosion from overheated fuel-water reaction damaged the reactor building
- Secondary containment: Cut hole to reduce likelihood of hydrogen gas buildup
- Sea water injection restarted with core cooling reported as not stable
- There are reports of a loud sound at Unit 2 in the vicinity of the suppression chamber. It was reported at 0730 EDT on March 15, 2011 that containment is intact (better than previously thought).
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)
- The spent fuel pool level is unknown. Possibility of steam/smoke from water boil-off or zirc-water reaction.

Unit 3

- Core damage due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Sea water is being injected with reported stable cooling
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- Primary containment described as "functional"
- The spent fuel pool level is unknown. Possibility of steam/smoke from water boil-off or zirc-water reaction.
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

Unit 4

- First fire in the reactor building was a small generator lube oil fire. IAEA reports that fire was put out at 2200 EDT, March 14.

- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)
- Second fire began at 1645 EDT, March 15, 2011 in reactor building. Reports indicate that this fire is not yet contained. Fuel reported to be uncovered.
- Radiation level outside Unit 4 reported to be 30R/hour following second fire.
- High radiation dose rates measured between Units 3 and 4, source is suspected to be the partially uncovered Unit 4 spent fuel pool.
- The spent fuel pool's ability to retain water is in doubt.
- Explosion (likely hydrogen) in Unit 4 due to uncovered fuel in the spent fuel pool (awaiting visual confirmation).

Unit 5

- The reactor is stable.
- Spent fuel pool is reported to be heating up.
- IAEA reports that water level in was down 40 cm in 5 hours since 0800 EDT March 15, 2011. It is not clear if this is the RPV or SFP water level. TEPCO plans to use operational diesel generator at Unit 6 to provide water to Unit 5.

Unit 6

- The reactor is stable.
- Spent fuel pool is reported to be heating up.

Fukushima Daini

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary. As of 1510 EST, March 12, 2011, an estimated 30,000 people have been evacuated. Full evacuation is not complete. As of 1830 EDT on March 15, 2011, there have not been updates to this information. The Daini units have AC power, and were previously reported to have lost their ultimate heat sink.

Unit 1-4

- All units have stable offsite power
- All units are reported to be in cold shutdown with stable water level
- Latest TEPCO reports do not mention any problem with the ultimate heat sink

Onagawa

At 2145 CET, March 13, 2011, IAEA reported that Japanese authorities had informed it that radioactivity levels at the site boundary of the Onagawa Nuclear Power Plant have returned to normal background levels.

Unit 1-3

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- The fire in the turbine building has been extinguished

NRC Evaluation of Radiation Measurements from the USS Ronald Reagan and USS George Washington

On the morning of March 13, 2011, Naval Reactors notified the NRC that dose rates were being measured from the flight deck of the USS Reagan that was ~130 nautical miles off the Japanese coast. Dose rates from the overhead "plume" were approximately 0.6 mrem/hour gamma with no measurable activity on the ship surfaces. The NRC had received an IAEA report showing dose rates of 100 mrem/hour up wind at the site boundary measured ~20 hours earlier and press reports for the previous day of plant venting. Given the meteorological conditions, wind speed of 3-5 mph and the calm 'Class D and E' weather stability for the 24-24 hour time period, a plume with low dose rates from the venting is credible at this location.

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Hypothetical Worst Case Daiichi Units 1, 2 and 3 Accident Sequence Based on our Knowledge of Current Plant Conditions

In this hypothetical event in which no cooling water is added to the core, the water level in the core will decrease, exposing the top of the core to a steam environment and a subsequent heat-up of the fuel rods. As the water continues to boil and recede toward the core bottom, the heat-up rate of the rods will increase rapidly resulting in fuel cladding failure and melt. With the continued lack of cooling water, the melting rods will relocate toward the bottom of the core and eventually into the lower plenum of the reactor vessel. Molten fuel and core debris entering the lower plenum will then cause the lower plenum liquid to boil. If cooling water is added to the drywell to a level above the top elevation of the lower plenum, lower head failure can be prevented. With no cooling water added to the drywell, the lower head will fail by creep rupture allowing molten fuel to enter the drywell. Moreover, the absence of cooling water to the drywell

could also result in a containment failure. With cooling water added to the drywell, however, a containment venting capability is also needed to preclude failure from over-pressurization. A containment failure will result in a large radioactive release to the environment.

Please note that failure to add water to the core and drywell is a hypothetical worst case event that will result in containment failure and radioactive release to the environment.

Protective Measures Team (PMT) Worst Case Analysis

A RASCAL run at 06:54AM (EDT) on March 16, 2011 for hypothetical combined core based on the following assumptions: Units 2 & 3 each, 33% core melt & no containment; Unit 4 fuel core offload 100% melt in the Spent Fuel Pool (SFP) with no roof; wind direction from West Northwest blowing out to the ocean. Results: PAG exceeded at 50 miles (80.5 km) with TEDE of 24.0 rem, and CDE thyroid of 130 rem.

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7 of 7
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USNRC Emergency Operations Center Status Update

March 15, 2011
Earthquake / Tsunami Status Update
Compiled by Executive Briefing Team

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Earthquake/Tsunami Status Update March 16, 2011

0630 EDT

Status of Japanese Facilities

(This information is compiled from available sources, including press releases by the Tokyo Electric Power Company (TEPCO) and information from the International Atomic Energy Agency (IAEA)).

IAEA reports that at 1331 UTC on March 15, 2011 a 6.1 magnitude earthquake occurred in eastern Honshu, approximately 100 km from the Hamaoka nuclear power plant. Operational units at the plant remain in safe status after the earthquake.

Background:

There are 14 operational Boiling Water Reactors (BWRs) proximal to the earthquake zone (6 at Fukushima Daiichi, 4 at Fukushima Daini, 3 at Onagawa, and 1 at Tokai)

Current Understanding of Japanese Reactor Status

(This information is compiled from TEPCO press releases and IAEA information releases.)

Fukushima Daiichi

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary and sheltering in place out to 30 km for residents who stayed behind. As of March 12, a 10 km complete radius evacuation has been ordered for the public. IAEA confirms a no-fly zone out to 30 km around the Fukushima Daiichi plant. As of 1830 EDT on March 15, 2011, there have been no updates to protective actions.

Japanese authorities classified the event at a Level 4 "Accident with Local Consequences" on the International Nuclear and Radiological Event Scale (INES) based on radioactive dose measurements at the site boundary exceeding limit values.

IAEA reported at 1340 EDT, March 15, 2011.

- Highest reading at fence was 60 mrem/hour at 0200 EDT
- Reduction of dose rates after the peak at 2122 EDT, March 14 (400 mSv/hr in area surrounding Unit 3)
- 30 mSv/hr between Units 2 & 3, and 100 mSv/hr surrounding Unit 4
- 2227 EDT, March 15: dose info came in from DTRA. GIS will figure out locations.
- Offsite dose measured in Tokai on the coast 100 km NE of Tokyo on March 14 at 1845 EDT was 5 uSv/hr.
- On March 14, NISA reported 160 people were exposed to radiation around the Fukushima nuclear power plant. 170,000 people have been evacuated.
- A no-fly zone was implemented 30 km from the site from zero to unlimited altitude.
- Source from DOE NIT who talked with FAA.
- On March 16, DITRA data is from 165 miles SSW from the site.

All available information indicates that the majority of releases from the Fukushima site have been carried out to sea by the prevailing winds. Forecast meteorological data for the 24 hour period (until 1700 EDT on March 16, 2011) indicates wind remaining toward offshore (N, NW).

Units 1, 2, and 3: shutdown due to earthquake

- At approximately 1000 EDT, March 14, 2011, Unit 2 core was again uncovered.

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Earthquake/Tsunami Status Update March 16, 2011

0630 EDT

Units 4, 5, and 6: shutdown due to outage, prior to earthquake

- All Units: all AC power on-site lost.
- Operators and other personnel not directly involved in water injection have been evacuated. 40-50 persons have been left onsite to mitigate accident.

Unit 1

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- As of 2200 JST (0900 EDT) on March 14, it is reported that sea water is being injected with reported stable cooling
- Containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- The spent fuel pool level is decreasing
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

Unit 2

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Reactor Core Isolation Cooling (RCIC) has failed
- Hydrogen explosion from overheated fuel-water reaction damaged the reactor building
- Secondary containment: Cut hole to reduce likelihood of hydrogen gas buildup
- Sea water injection restarted with core cooling reported as not stable
- There are reports of a loud sound at Unit 2 in the vicinity of the suppression chamber. It was reported at 0730 EDT on March 15, 2011, that containment is intact (better than previously thought).
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)
- The spent fuel pool level is decreasing

Unit 3

- Core damage due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Sea water is being injected with reported stable cooling
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- Primary containment described as "functional"
- The spent fuel level is decreasing, with zirc interaction
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

Unit 4

- First fire in the reactor building was a small generator lube oil fire. IAEA reports that fire was put out at 2200 EDT, March 14.
- High radiation levels reduced to 600 μ Sv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

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Earthquake/Tsunami Status Update March 16, 2011

0630 EDT

- Second fire began at 1645 EDT, March 15, 2011 in reactor building. Reports indicate that this fire is not yet contained. TEPCO is determining whether to use helicopter or fire truck to fight fire. Fuel reported to be uncovered.
- Radiation level inside Unit 4 reported to be 30R/hour following second fire.
- High radiation dose rates measured between Units 3 and 4, source is suspected to be the partially uncovered Unit 4 spent fuel pool.
- There is a total water loss from the spent fuel pool with no ability to retain water in the pool; and zirc interaction taking place
- There are reports of possible hydrogen explosion due to uncovered fuel in the spent fuel pool (awaiting visual confirmation).
- Unconfirmed reports of 30 R/hr at the Unit 4 SFP which is making fire fighting difficult (March 15). Another fire at Unit 4 SFP.

Unit 5

- The reactor is stable.
- Spent fuel pool is reported to be heating up.
- IAEA reports that water level in was down 40 cm in 5 hours since 0800 EDT, March 15, 2011. It is not clear if this is the RPV or SFP water level. TEPCO plans to use operational diesel generator at Unit 6 to provide water to Unit 5.

Unit 6

- The reactor is stable.
- Spent fuel pool is reported to be heating up.

Fukushima Daini

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary. As of 1510 EST, March 12, 2011, an estimated 30,000 people have been evacuated. Full evacuation is not complete. As of 1830 EDT on March 15, 2011, there have not been updates to this information. The Daini units have AC power, and were previously reported to have lost their ultimate heat sink.

Unit 1-4

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Onagawa

At 2145 EST, March 13, 2011, IAEA reported that Japanese authorities had informed it that radioactivity levels at the site boundary of the Onagawa Nuclear Power Plant have returned to normal background levels.

Unit 3

- All units are shutdown and stable
- The fire in the turbine building has been extinguished

Earthquake/Tsunami Status Update March 16, 2011

0630 EDT

NRC Evaluation of Radiation Measurements from the USS Ronald Reagan and USS George Washington

On the morning of March 13, 2011, Naval Reactors notified the NRC that dose rates were being measured from the flight deck of the USS Reagan that was ~130 nautical miles off the Japanese coast. Dose rates from the overhead "plume" were approximately 0.6 mrem/hour gamma with no measurable activity on the ship surfaces. The NRC had received an IAEA report showing dose rates of 100 mrem/hour up wind at the site boundary measured ~20 hours earlier and press reports for the previous day of plant venting. Given the meteorological conditions, wind speed of 3-5 mph and the calm 'Class D and E' weather stability for the 20-24 hour time period, a plume with low dose rates from the venting is credible at this location.

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Reactor Safety Team Worst Case Analysis

Hypothetical Worst Case Daiichi Units 1, 2 and 3 Accident Sequence Based on our Knowledge of Current Plant Conditions

In this hypothetical event in which no cooling water is added to the core, the water level in the core will decrease, exposing the top of the core to a steam environment and a subsequent heat-up of the fuel rods. As the water continues to boil and recede toward the core bottom, the heat-up rate of the rods will increase rapidly resulting in fuel cladding failure and melt. With the continued lack of cooling water, the melting rods will relocate toward the bottom of the core and eventually into the lower plenum of the reactor vessel. Molten fuel and core debris entering the lower plenum will then cause the lower plenum liquid to boil. If cooling water is added to the drywell to a level above the top elevation of the lower plenum, lower head failure can be prevented. With no cooling water added to the drywell, the lower head will fail by creep rupture allowing molten fuel to enter the drywell. Moreover, the absence of cooling water to the drywell

could also result in a containment failure. With cooling water added to the drywell, however, a containment venting capability is also needed to preclude failure from over-pressurization. A containment failure will result in a large radioactive release to the environment.

Please note that failure to add water to the core and drywell is a hypothetical worst case event that will result in containment failure and radioactive release to the environment.

Protective Measures Team (PMT) Worst Case Analysis

On March 15, 2011, the PMT ran RASCAL offsite dose estimations for a hypothetical x-vessel core failure with loss of containment at a boiling water reactor (BWR) similar to Fukushima Daiichi Unit 2 with loss of containment. Two estimates were run: 1) no change in wind direction (wind toward Tokyo) and 2) with the predicted wind shift counterclockwise over the island and back out to sea. For the steady wind direction scenario, Protective Action Guides (PAGs) (>1 rem Total Effective Dose Equivalent (TEDE) and >5 rem Committed Dose Equivalent (CDE)) were exceeded at 50 miles beyond Unit 2. For the wind shift scenario, PAGs were exceeded between 30 to 40 miles.

Another RASCAL run with assumptions to model the Fukushima Unit 4 spent fuel pool (SFP) was updated to reflect a spent fuel inventory of 1331 bundles. Since observed meteorological data is unavailable, forecast meteorological data for the 24 hour release period, which indicate wind shifting offshore, were used. For the meteorological conditions utilized, at 20 miles, the PAG for TEDE is 1.4 rem, slightly above the 1 rem PAG. At 30 miles, the TEDE is 0.9 rem.

As of 1900 EDT on March 15, 2011, we believe the runs are bounding for all four units. The PMT is working to update the RASCAL run for the Unit 4 spent fuel pool, using actual meteorological parameters.

Reference

Units

1 rem (rem) = 1,000 millirem (mrem)

1 Sievert (Sv) = 1,000 milliSieverts (mSv) = 1,000,000 microsieverts (μ Sv)

1 rem = 0.01 Sv = 10 mSv

NOT FOR PUBLIC DISCLOSURE

USNRC Emergency Operations Center Status Update

March 15, 2011
Earthquake / Tsunami Status Update
Compiled by Executive Briefing Team

Caution – This information may be dated and is subject to constant change.
Changes/Additions from previous updates are underlined

USNRC Status

At 0946 EST, March 11, 2011, the NRC entered Monitoring Mode and the agency continues to monitor the unfolding events in Japan. The Headquarters Operations Center is staffed.

The two senior experts supporting USAID response efforts from the NRC are in Japan and have engaged with the US Ambassador's staff. Nine additional experts are in transit to Japan.

At 0550 EDT, March 14, 2011, the NRC experts in Japan reported that the Japanese have requested US technical assistance with cooling the Fukushima Daiichi Units 1, 2, and 3. The effort is being coordinated by the US Ambassador. At 0900 EDT (March 15, 2011), the Japanese government accepted DOE's Radiological Assistance Program (RAP) team assistance, which includes Aerial Measuring System (AMS) fly-overs.

The NRC is evaluating the current plant status information, and based on the information provided to date some fuel damage has occurred. The NRC is monitoring the restoration of cooling water to prevent additional fuel damage. Current information indicates that the structures that contain the reactor vessels remain intact.

On March 14, 2011, NRC performed preliminary analysis based on the information available from the Japanese authorities. The result indicated the protective measures implemented by the Japanese government, including evacuation, sheltering, and potassium iodide, are not inconsistent with the U.S. Protective Action Guidelines. The NRC does not expect the U.S. and its territories to experience any harmful levels of radioactivity.

NRC provided the White House with information on protective measures for NRC staff in Japan, being able to provide advice for other federal workers in Japan, and that US citizens in Japan should follow advice of the government of Japan.

NRC is also coordinating with the International Atomic Energy Agency.

Q & A's have been developed and shared with Regional State Liaison Officers to dialogue with State counterparts.

NRC has issued 6 press releases related to the earthquake and tsunami. These press releases can be found online at: <http://www.nrc.gov/reading-rm/doc-collections/news/2011/>

Status of NRC Licensee and Agreement State Facilities

At this time, NRC is discontinuing reporting status of NRC licensee and Agreement State facilities. NRC will resume this reporting should any issues arise related to earthquake or tsunami effects.

The Institute of Nuclear Power Operations (INPO) issued a Level 1 Event Report (highest level) to its members this afternoon. It identifies 4 actions, with due dates, and requires a written response. In general, the actions include walkdowns and verifications of aspects of facility capabilities to address B.5.b equipment and procedures, Severe Accident Management Guidelines (SAMGs), mitigation of station blackout (SBO) conditions, mitigation of internal and external flooding, and fire and flooding events that could be impacted by a concurrent seismic event.

Status of Japanese Facilities (This information is compiled from available sources, including press releases by the Tokyo Electric Power Company (TEPCO) and information from the International Atomic Energy Agency (IAEA)).

IAEA reports that at 1331 UTC on March 15, 2011 a 6.1 magnitude earthquake occurred in eastern Honshu, approximately 100 km from the Hamaoka nuclear power plant. Operational units at the plant remain in safe status after the earthquake.

Background:

There are 14 operational Boiling Water Reactors (BWRs) proximal to the earthquake zone (6 at Fukushima Daiichi, 4 at Fukushima Daini, 3 at Onagawa, and 1 at Tokai)

Current Understanding of Japanese Reactor Status

(This information is compiled from TEPCO press releases and IAEA information releases.)

Fukushima Daiichi

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary and sheltering in place out to 30 km for residents who stayed behind. IAEA confirms a no fly zone out to 30 km around the Fukushima Daiichi plant. As of 1830 EDT on March 15, 2011, there have been no updates to protective actions.

Japanese authorities classified the event at a Level 4 "Accident with Local Consequences" on the International Nuclear and Radiological Event Scale (INES) based on radioactive dose measurements at the site boundary exceeding limit values.

All available information indicates that the majority of releases from the Fukushima site have been carried out to sea by the prevailing winds. Forecast meteorological data for the 24 hour period (until 1700 EDT on March 16, 2011) indicates wind remaining toward offshore (N, NW).

Units 1, 2, and 3: shutdown due to earthquake

- At approximately 1000 EDT (March 14, 2011), Unit 2 core was again uncovered.

Units 4, 5, and 6: shutdown due to outage, prior to earthquake

All Units: all AC power on-site lost.

Operators and other personnel not directly involved in water injection have been evacuated. 40-50 persons have been left onsite to mitigate accident.

Unit 1

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- As of 2200 JST (0900 EDT) on March 14, it is reported that sea water is being injected.
- Containment described as "functional."
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building roof.
- Sea water is being injected with reported stable cooling
- The spent fuel pool level is unknown
- High radiation levels reduced to 600 mSv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011 at site gate. (Site gate is same for each unit).

Unit 2

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Reactor Core Isolation Cooling (RCIC) has failed.
- Hydrogen explosion from overheated fuel-water reaction damaged the reactor building
- Sea water injection restarted with reports of non-stable conditions.
- There are reports of a loud sound at Unit 2 in the vicinity of the suppression chamber. It was reported at 0730 EDT on March 15, 2011 that containment is intact (better than previously thought).
- High radiation levels reduced to 600 mSv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011 at site gate. (Site gate is same for each unit).
- The spent fuel pool level is unknown

Unit 3

- Core damage due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Sea water is being injected with reported stable cooling
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building roof.
- Primary containment described as "functional."
- There is no spent fuel pool information
- High radiation levels reduced to 600 mSv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011 at site gate. (Site gate is same for each unit).

Unit 4

- Fire in the reactor building was a small generator lube oil fire. IAEA reports that fire was put out at 2200 EDT, March 14.
- High radiation levels reduced to 600 mSv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011 at site gate. (Site gate is same for each unit).

- Second fire began 1645 EDT, March 15, 2011 in reactor building. Reports indicate that this fire is not yet contained. TEPCO is determining whether to use helicopter or fire truck to fight fire. Fuel reported to be uncovered.
- Radiation level in the area of unit 4 reported to be 30R/hour following second fire.
- There is a possible water loss from the spent fuel pool and operators are having difficulty providing adequate cooling and water level to the pool.
- There are reports of possible hydrogen explosion due to uncovered fuel in the spent fuel pool (awaiting visual confirmation).
- High radiation dose rates measured between Units 3 and 4, source is suspected to be the partially uncovered Unit 4 spent fuel pool.

Unit 5

- The reactor is stable.
- Spent fuel pool is reported to be heating up.

Unit 6

- The reactor is stable.
- Spent fuel pool is reported to be heating up.

Fukushima Daiichi

Japanese national government instructed evacuation for local residents within a 20km radius of the site boundary. As of 1510 EST (March 12, 2011), an estimated 30,000 people have been evacuated. Full evacuation is not complete, As of 1830 EDT on March 15, 2011, there have not been updates to this information. The Daiichi units have AC power, and were previously reported to have lost their ultimate heat sink.

Unit 1-4

- All units have stable offsite power
- All units are reported to be in cold shutdown with stable water level
- Latest TEPCO reports do not mention any problem with the ultimate heat sink

Onagawa

At 2145 CET (March 13, 2011), IAEA reported that Japanese authorities had informed it that radioactivity levels at the site boundary of the Onagawa Nuclear Power Plant have returned to normal background levels.

Unit 1-3

- All units are shutdown and stable
- The fire in the turbine building has been extinguished

NRC Evaluation of Radiation Measurements from the USS Ronald Reagan and USS George Washington

On the morning of March 13, 2011, Naval Reactors notified the NRC that dose rates were being measured from the flight deck of the USS Reagan that was ~130 nautical miles off the Japanese coast. Dose rates from the overhead "plume" were approximately 0.6 mrem per hour gamma with no measurable activity on the ship surfaces. The NRC had received an IAEA report showing dose rates of 100 mrem/hr up wind at the site boundary measured ~ 20 hours earlier and press reports for the previous day of plant venting. Given the meteorological conditions; wind speed of 3-5 mph and the calm 'Class D and E' weather stability for the 20-24 hour time period, a plume with low dose rates from the venting is credible at this location.

NRC staff believes that US Naval readings are not inconsistent based on reports and shore dose measurements received from Japanese officials during venting from Fukushima Daiichi Units 1, 2, and 3.

The Navy sent the contamination samples to a base in Japan to perform an isotopic analysis to determine the actual radio-nuclides. The principle radionuclides identified were iodine, cesium, and technetium, consistent with a release from a nuclear reactor.

The US 7th Fleet has repositioned its ships out of the downwind plume direction from the Fukushima Daiichi Nuclear Power Plant after detecting low level contamination in the air and on its aircraft operating in the area.

The US Navy identified radiological data from the USS George Washington located at Yokosuka Base at 0300 EDT on March 15, 2011 that showed an air sample of 7E-9 uCi/mL, from which the Navy estimated a dose rate of 1.5 mrem/hour.

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Please note that failure to add water to the core and drywell is a hypothetical worst case event that will result in containment failure and radioactive release to the environment.

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On March 15, 2011, the PMT ran RASCAL offsite dose estimations for a hypothetical x-vessel core failure with loss of containment at a boiling water reactor (BWR) similar to Fukushima Daiichi Unit 2 with loss of containment. Two estimates were run: 1) no change in wind direction (wind toward Tokyo) and 2) with the predicted wind shift counterclockwise over the island and back out to sea. For the steady wind direction scenario, Protective Action Guides (PAGs) (>1 rem Total Effective Dose Equivalent (TEDE) and >5 rem Committed Dose Equivalent (CDE)) were exceeded at 50 miles beyond Unit 2. For the wind shift scenario, PAGs were exceeded between 30 to 40 miles.

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As of 1900 EDT on March 15, 2011, we believe the runs are bounding for all four units. The PMT is working to update the RASCAL run for the Unit 4 spent fuel pool, using actual meteorological parameters.

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TALKING POINTS

JAPAN NUCLEAR SITUATION

As of 3/17/2011 7:30 p.m. EDT

Update: Addition of bullets on expanding EPZ to 50 miles, and response to news report ranking plants by vulnerability to earthquakes.

- Based on calculations performed by NRC experts, we now believe that it is appropriate for U.S. residents within 50 miles of the Fukushima reactors to evacuate. Our recommendation is based on NRC guidelines for public safety that would be used in the United States under similar circumstances.
- The 10-mile EPZ reflects the area where projected doses from design basis accidents at nuclear power plants would not exceed the EPA's protective action guidelines, and we are confident that it would be adequate even for severe accidents. However, the 10-mile zone was always considered a base for emergency response that could be expanded if the situation warranted. The situation in Japan, with four reactors experiencing exceptional difficulties simultaneously, creates the need to expand the EPZ beyond the normal 10-mile radius.

We have said from the beginning of this crisis that the NRC would analyze this situation for any lessons that can be derived to improve our oversight of U.S. nuclear power plants. Emergency planning will be part of that review.

- Given the results of the monitoring and distance between Japan and Hawaii, Alaska, U.S. Pacific Territories and the U.S. West Coast, the NRC expects the U.S. to avoid any harmful levels of radioactivity. The NRC is aware of various internet postings depicting modeled radiation plumes for the ongoing events at the nuclear power plants in Japan. All of the models the NRC has seen are based on generic assumptions regarding the potential radiation release from the plants and as such are unable to predict actual radiation levels away from the site. The NRC is working closely with our federal partners to monitor radiation releases from the Japanese nuclear power plants.
- The NRC is working with other U.S. agencies to monitor radioactive releases from Japan and to predict their path.
- The NRC continues to believe, based on all available information, that the type and design of the Japanese reactors, combined with how events have unfolded, will prevent radiation at harmful levels from reaching U.S. territory.
- The Department of Energy has been designated the lead agency for communicating information to the States regarding monitoring of radiation heading toward or over the United States. The DOE's Lawrence Livermore National Laboratory (National Atmospheric Release Assessment Center) is monitoring weather patterns over the Pacific Ocean. The Environmental Protection Agency maintains air monitoring stations throughout the country and has reinforced its monitoring effort. DOE will provide aerial monitoring. Questions about this effort should be directed to DOE at 202 586 4940.
- [Status as of 9:35pm on 3/16] The NRC is closely monitoring information about the spent fuel pools as well as radiation levels at the Japanese nuclear power plants. Given the totality of the situation, the NRC's recommendation for U.S. residents within 50 miles of the Fukushima reactors to evacuate remains unchanged. That recommendation was based on actual radiation levels in the nuclear complex.

- In accordance with established protocols, U.S. Customs and Border Protection (CBP) employs several types of radiation detection equipment in its operations at both air and sea ports, and uses this equipment, along with specific operational protocols, to resolve any security or safety risks that are identified with inbound travelers and cargo. Out of an abundance of caution, CBP has issued field guidance reiterating its operational protocols and directing field personnel to specifically monitor maritime and air traffic from Japan. CBP will continue to evaluate the potential risks posed by radiation contamination on inbound travelers and cargo and will adjust its detection and response protocols, in coordination with its interagency partners, as developments warrant.
- The Japanese government has formally asked for U.S. assistance in responding to nuclear power plant cooling issues triggered by an earthquake and tsunami on March 11. The NRC has eleven staff on the ground in Japan as part of the USAID team.
- The NRC is coordinating its actions with other federal agencies as part of the U.S. government response. The NRC's headquarters Operations Center was activated at the beginning of the event and has been monitoring the situation on a 24-hour basis ever since.
- The NRC is always looking to learn information that can be applied to U.S. reactors and we will analyze the information that comes from this incident. President Obama has directed the agency to conduct a comprehensive review of the safety of U.S. nuclear plants; the agency will do so.
- U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster.

- The NRC requires that safety-significant structures, systems, and components be designed to take into account the most severe natural phenomena historically reported for the site and surrounding area. The NRC then adds a margin for error to account for the limitations on historical data. In other words, U.S. nuclear power plants are designed to be safe based on historical data to predict the area's maximum credible earthquake.
- In response to MSNBC report ranking US NPPs according to vulnerability to earthquakes: The NRC does not rank nuclear power plants according to their vulnerability to earthquakes. This "ranking" was developed by an MSNBC reporter using partial information and an even more partial understanding of how we evaluate plants for seismic risk. Each plant is evaluated individually according to the geology of its site, not by a "one-size-fits-all" model - therefore such rankings or comparisons are highly misleading.

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TALKING POINTS

JAPAN NUCLEAR SITUATION

As of 3/16/2011 7:15 p.m. EDT

Update: Addition of bullet on status of SFPs

- Based on calculations performed by NRC experts, we now believe that it is appropriate for U.S. residents within 50 miles of the Fukushima reactors to evacuate. Our recommendation is based on NRC guidelines for public safety that would be used in the United States under similar circumstances.
- Given the results of the monitoring and distance between Japan and Hawaii, Alaska, U.S. Pacific Territories and the U.S. West Coast, the NRC expects the U.S. to avoid any harmful levels of radioactivity. The NRC is aware of various internet postings depicting modeled radiation plumes for the ongoing events at the nuclear power plants in Japan. All of the models the NRC has seen are based on generic assumptions regarding the potential radiation release from the plants and as such are unable to predict actual radiation levels away from the site. The NRC is working closely with our federal partners to monitor radiation releases from the Japanese nuclear power plants.
- The NRC continues to believe, based on all available information, that the type and design of the Japanese reactors, combined with how events have unfolded, will prevent radiation at harmful levels from reaching U.S. territory.

- [Status as of 7:00pm on 3/16] The NRC is closely monitoring the condition of the spent fuel pools at the Japanese nuclear power plants. Our current understanding, which is based on the best available information provided to NRC reactor experts in Japan, is the following:
 - Unit 4 – The SFP is likely dry and the integrity of the spent fuel pool is in question.
 - Units 2 & 3 – Steam is escaping which indicates that boiling is likely occurring in the spent fuel pool. The current water level of the pool is uncertain.
 - Unit 1 – The status of the SFP is unknown.
- In accordance with established protocols, U.S. Customs and Border Protection (CBP) employs several types of radiation detection equipment in its operations at both air and sea ports, and uses this equipment, along with specific operational protocols, to resolve any security or safety risks that are identified with inbound travelers and cargo. Out of an abundance of caution, CBP has issued field guidance reiterating its operational protocols and directing field personnel to specifically monitor maritime and air traffic from Japan. CBP will continue to evaluate the potential risks posed by radiation contamination on inbound travelers and cargo and will adjust its detection and response protocols, in coordination with its interagency partners, as developments warrant.
- The Japanese government has formally asked for U.S. assistance in responding to nuclear power plant cooling issues triggered by an earthquake and tsunami on March 11. The NRC has eleven staff on the ground in Japan as part of the USAID team.
- The NRC is coordinating its actions with other federal agencies as part of the U.S. government response. The NRC's headquarters Operations Center was activated at the beginning of the event and has been monitoring the situation on a 24-hour basis ever since.

- The NRC is always looking to learn information that can be applied to U.S. reactors and we will analyze the information that comes from this incident.
- The NRC is working with other U.S. agencies to monitor radioactive releases from Japan and to predict their path.
- U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster.
- The NRC requires that safety-significant structures, systems, and components be designed to take into account the most severe natural phenomena historically reported for the site and surrounding area. The NRC then adds a margin for error to account for the limitations on historical data. In other words, U.S. nuclear power plants are designed to be safe based on historical data to predict the area's maximum credible earthquake.

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TALKING POINTS

JAPAN NUCLEAR SITUATION

As of 3/16/2011 6:45 p.m. EDT

- Based on calculations performed by NRC experts, we now believe that it is appropriate for U.S. residents within 50 miles of the Fukushima reactors to evacuate. Our recommendation is based on NRC guidelines for public safety that would be used in the United States under similar circumstances.
- Given the results of the monitoring and distance between Japan and Hawaii, Alaska, U.S. Pacific Territories and the U.S. West Coast, the NRC expects the U.S. to avoid any harmful levels of radioactivity. The NRC is aware of various internet postings depicting modeled radiation plumes for the ongoing events at the nuclear power plants in Japan. All of the models the NRC has seen are based on generic assumptions regarding the potential radiation release from the plants and as such are unable to predict actual radiation levels away from the site. The NRC is working closely with our federal partners to monitor radiation releases from the Japanese nuclear power plants.
- The NRC continues to believe, based on all available information, that the type and design of the Japanese reactors, combined with how events have unfolded, will prevent radiation at harmful levels from reaching U.S. territory.

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- The Japanese government has formally asked for U.S. assistance in responding to nuclear power plant cooling issues triggered by an earthquake and tsunami on March 11. The NRC has eleven staff on the ground in Japan as part of the USAID team.
- The NRC is coordinating its actions with other federal agencies as part of the U.S. government response. The NRC's headquarters Operations Center was activated at the beginning of the event and has been monitoring the situation on a 24-hour basis ever since.
- The NRC is always looking to learn information that can be applied to U.S. reactors and we will analyze the information that comes from this incident.
- The NRC is working with other U.S. agencies to monitor radioactive releases from Japan and to predict their path.

U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster.

- The NRC requires that safety-significant structures, systems, and components be designed to take into account the most severe natural phenomena historically reported for the site and surrounding area. The NRC then adds a margin for error to account for the limitations on historical data. In other words, U.S. nuclear power plants are designed to be safe based on historical data to predict the area's maximum credible earthquake.

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TALKING POINTS

JAPAN NUCLEAR SITUATION

As of 3/16/2011 1:45 p.m. EDT

- Based on calculations performed by NRC experts, we now believe that it is appropriate for U.S. residents within 50 miles of the Fukushima reactors to evacuate. Our recommendation is based on NRC guidelines for public safety that would be used in the United States under similar circumstances.
 - The NRC continues to believe, based on all available information, that the type and design of the Japanese reactors, combined with how events have unfolded, will prevent radiation at harmful levels from reaching U.S. territory.
 - The Japanese government has formally asked for U.S. assistance in responding to nuclear power plant cooling issues triggered by an earthquake and tsunami on March 11. The NRC has eleven staff on the ground in Japan as part of the USAID team.
- The NRC is coordinating its actions with other federal agencies as part of the U.S. government response. The NRC's headquarters Operations Center was activated at the beginning of the event and has been monitoring the situation on a 24-hour basis ever since.

- The NRC is always looking to learn information that can be applied to U.S. reactors and we will analyze the information that comes from this incident.
- The NRC is working with other U.S. agencies to monitor radioactive releases from Japan and to predict their path.
- Given the results of the monitoring and distance between Japan and Hawaii, Alaska, U.S. Pacific Territories and the U.S. West Coast, the NRC expects the U.S. to AVOID any harmful levels of radioactivity.
- U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster.
- The NRC requires that safety-significant structures, systems, and components be designed to take into account the most severe natural phenomena historically reported for the site and surrounding area. The NRC then adds a margin for error to account for the historical data's limited accuracy. In other words, U.S. nuclear power plants are designed to be safe based on historical data to predict the area's maximum credible earthquake.

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TALKING POINTS

JAPAN NUCLEAR SITUATION

As of 3/15/2011 8:30 A.M. EDT

- The NRC continues to believe that the type and design of the Japanese reactors, combined with how events have unfolded, will prevent radiation at harmful levels from reaching U.S. territory.
- The NRC believes the Japanese response to the reactor situations and the protective actions they are taking are comparable to how we would respond. We advise Americans in Japan to follow the guidance of Japanese officials.
- The Japanese government has formally asked for U.S. assistance in responding to nuclear power plant cooling issues triggered by an earthquake and tsunami on March 11. The NRC has two staff on the ground in Japan as part of the USAID team and 10 other NRC personnel are enroute.
- The NRC is coordinating its actions with other federal agencies as part of the U.S. government response. The NRC's headquarters Operations Center is activated and monitoring the situation on a 24-hour basis.

- The NRC is always looking to learn information that can be applied to U.S. reactors and we will analyze the information that comes from this incident.
- The NRC is working with other U.S. agencies to monitor radioactive releases from Japan and to predict their path.
- Given the results of the monitoring and distance between Japan and Hawaii, Alaska, U.S. Pacific Territories and the U.S. West Coast, the NRC expects the U.S. to AVOID any harmful levels of radioactivity.
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TALKING POINTS

JAPAN NUCLEAR SITUATION

As of 3/14/2011 3 P.M. EST

In a White House briefing this morning, Chairman Jaczko said the type and design of the Japanese reactors and the way events have unfolded give us confidence in saying radiation at harmful levels will not reach the U.S.

Jaczko also said today that we believe the protective steps the Japanese are taking are comparable to ones we would use here and that we advise Americans in Japan to follow the guidance of Japanese officials.

According to Chairman Jaczko, the NRC is always looking to learn information that can be applied to the U.S. reactors and we will certainly be looking at the information that comes from this incident.

The Japanese government has formally asked for assistance from the United States as it continues to respond to nuclear power plant cooling issues triggered by an earthquake and tsunami on March 11. The NRC is assembling a team to send over in response to the request for help.

The NRC already has two experts in boiling-water reactors (BWR) in Tokyo offering technical assistance. They are part of a USAID team.

The NRC is working with other U.S. agencies to monitor radioactive releases from Japan and to predict their path. All the available information indicates weather conditions have taken the small releases from the Fukushima reactors out to sea away from the population.

Given the results of the monitoring and distance between Japan and Hawaii, Alaska, the U.S. Territories and the U.S. West Coast, the NRC does NOT expect the U.S. to experience any harmful levels of radioactivity.

Nuclear power plants are built to withstand environmental hazards, including earthquakes. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster.

The NRC requires that safety-significant structures, systems, and components be designed to take into account the most severe natural phenomena historically reported for the site and surrounding area. The NRC then adds a margin for error to account for the historical data's limited accuracy. In other words, U.S. nuclear power plants are designed to be safe based on historical data from the area's maximum credible earthquake.

The NRC is coordinating its actions with other federal agencies as part of the U.S. government response. The NRC's headquarters Operations Center is activated and monitoring the situation on a 24-hour basis.

Talking Points

For Internal Use Only

RESPONSE TO RADIOLOGICAL EMERGENCIES INVOLVING NUCLEAR POWER PLANTS IN THE U.S.

- In the event of an incident or explosion occurring at a nuclear power plant in the U.S., the Department of Homeland Security would bring to bear the expertise and authorities of agencies across the Federal government. These roles are outlined in the National Response Framework, a guide to how the nation conducts all-hazards response – from the smallest incident to the largest catastrophe. The NRF makes clear the roles and responsibilities of federal agencies under all domestic incidents, so that all other members of the nation's emergency management team understand how the federal response would be coordinated. It applies to both Stafford Act and non-Stafford Act events. For more on the NRF, click here: http://www.fema.gov/pdf/emergency/nrf/NRF_FAQ.pdf
- Under this scenario, several agencies would have lead roles in technical and operational needs. For instance:
 - The Nuclear Regulatory Commission (NRC) would coordinate incidents at, or caused by, a facility that is licensed by the NRC or under agreement with the NRC, such as commercial nuclear power plants.
 - The Environmental Protection Agency EPA would coordinate the Federal environmental response to incidents involving the release of nuclear/radioactive materials that occur in the inland zone and in certain coastal zones.
- FEMA would stand ready to support the federal response efforts in any way needed, as permitted under our authorities. We would leverage all of the resources our agency brings to bear, including our expertise in disaster response and recovery coordination, help with staffing, and other needs, in support of the federal response and the impacted states and local communities.
- When disasters strike, the first responders are local emergency and public works personnel, volunteers, humanitarian organizations, and numerous private interest groups who provide emergency assistance required to protect the public's health and safety and to meet immediate human needs.
- While the NRC has a key role in working with many of the nation's nuclear power plants meet regulatory requirements for emergency planning and preparedness for onsite nuclear power plant activities, FEMA has a key role in working with states and local communities with

emergency planning and preparedness for offsite radiological activities – meaning for the residents and communities beyond the physical boundaries of the power plant.

- FEMA established the Radiological Emergency Preparedness Program to provide state and local communities the support and resources they need to ensure the health and safety of citizens living around commercial nuclear power plants would be adequately protected in the event of a nuclear power plant accident; and inform and educate the public about radiological emergency preparedness.
- As part of this effort, FEMA works closely with state, local and tribal communities to ensure they have adequate emergency plans in place to protect public health and safety, ensure that these plans can be used by emergency response personnel and include sufficient resources and equipment during an emergency, and provided emergency preparedness training to state and local officials as needed. Under this program, FEMA also evaluates the alert and notification system for nuclear power plants, including outdoor warning sirens and back-up systems.
- FEMA cooperates closely with the NRC in these efforts and provides its findings from these evaluations to the NRC.
- As we do with all hazards, FEMA is focused on making sure the public is aware of the various risks in their communities and providing preparedness and safety information about the potential impact of a nuclear or radiological threat. Families that live near or around nuclear power plants should become informed about simple steps they can take to protect themselves in the event of a nuclear explosion by contacting their local Office of Emergency Management, referring to information in the local telephone directory and publications received about emergency preparedness. Individuals and families can also visit <http://www.ready.gov/america/beinformed/nuclear.html>

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Talking Points Provided by DHS – NATIONAL JIC
2:54pm, March 16, 2011

IF ASKED about any questions about harmful radiation headed towards the US: NRC Chairman Jaczko continues to say the following: "You just aren't going to have any radiological material that, by the time it traveled those large distances, could present any risk to the American public."

Topline Points

- The United States is continuing to do everything in its power to help Japan and American citizens who were there at the time of these tragic events.
- USAID is coordinating the overall U.S. government efforts in support of the Japanese government's response and are currently directing individuals to www.usaid.gov for information about response donations.
- The President is being kept up to date and is constantly being briefed by his national security staff. The National Security staff in the White House is also coordinating a large interagency response with experts meeting around the clock to monitor the latest information coming out of Japan.
- We have offered our Japanese friends includes disaster response experts, search and rescue teams, technical advisers with nuclear expertise and logistical support from the United States military.
- In response to the deteriorating situation at the Fukushima Nuclear Power Plant, the United States Nuclear Regulatory Commission (NRC), the Department of Energy and other technical experts in the U.S. Government have reviewed the scientific and technical information they have collected from assets in country, as well as what the Government of Japan has disseminated. Consistent with the NRC guidelines that would apply to such a situation in the United States, we are recommending, as a precaution, that American citizens who live within 50 miles (80 kilometers) of the Fukushima Nuclear Power Plant evacuate the area or to take shelter indoors if safe evacuation is not practical.
- We want to underscore that there are numerous factors in the aftermath of the earthquake and Tsunami, including weather, wind direction and speed, and the nature of the reactor problem that affect the risk of radioactive contamination within this 50 mile radius or the possibility of lower-level radioactive materials reaching greater distances.
- To support our citizens there, the Embassy is working around the clock, we have our consular services available 24 hours a day to determine the whereabouts and well-being of all U.S. citizens in Japan. U.S. citizens in need of emergency assistance should send an e-mail to JapanEmergencyUSC@state.gov with detailed information about their location and contact information, and monitor the U.S. Department of State website at travel.state.gov.

As I said earlier, we have offered our Japanese friends disaster response experts, search and rescue teams, technical advisers with nuclear expertise and logistical support from the United States military.

- Secretary Chu announced that DOE offered and Japan accepted an Aerial Measuring System capability, including detectors and analytical equipment used to provide assessments of contamination on the ground. In total, the DOE team includes 34 people.
- USAID set up a Response Management Team in DC and sent a Disaster Assistance Response Team to Tokyo, which includes people with nuclear expertise from the Departments of Energy and Health and Human Services as well the Nuclear Regulatory Commission (NRC). The NRC members are experts in boiling water nuclear reactors and are available to assist their Japanese counterparts.
- Two Urban Search and Rescue Teams (LA County and Fairfax County teams) which total 144 members plus 12 search and rescue canines and up to 41 metric tons of rescue equipment have begun searching for survivors.
- The Department of Defense has the USS Reagan on station off the coast of Japan and is currently using an air facility in Misawa as a forward operating base.
- The American Red Cross (ARC) International Services team is supporting the Japanese Red Cross Society (JRCS) to assess the impact, determine response efforts, and assist the people of Japan.
- USAID is hosting a daily conference call with Congressional staff, including participation from DoD, DoS, NRC, DOE, and HHS. The U.S. officials will continue to provide a brief overview of each agency's efforts in the response to Japan and respond to questions from the Congressional staff regarding humanitarian assistance, military assistance, and the nuclear plant situation.
- Currently nearly 5300 US military members are supporting the disaster relief efforts. There are 8 ships, including the aircraft carrier USS Ronald Reagan, transport aircraft and more than 100 military helos are being repositioned to northern Japan to support the efforts.
- The US military has flown reconnaissance flights and provided the Japanese government with images of the areas affected by the earthquake and tsunami. Search and rescue flights and missions along the coast continue, relief operations including delivery of food, water and other relief supplies also continue.
- Yokota Air Base is serving as a humanitarian relief operations staging area and Misawa Air Base is serving as both a logistical hub for humanitarian relief and rescue workers as well as an operating base for U.S., Japanese and other international helos and aircraft.

Here at home, the government is doing a number of things as well.

- The US Government will be studying every aspect of the Japanese disaster and the Japanese government's response, with the goal of learning as much as possible from that review.
- As the Nuclear Regulatory Commission has said, we do not expect to see radiation at harmful levels reaching the U.S. from damaged Japanese nuclear power plants. As part of the federal government's continuing effort to make our activities and science transparent and available to the public, the Environmental Protection Agency (EPA) will continue to keep all RadNet data available in the current online database. In addition, EPA plans to work with its federal partners to deploy additional monitoring capabilities to parts of the western U.S. and U.S. territories.
- As always, EPA is utilizing this existing nationwide radiation monitoring system, RadNet, which continuously monitors the nation's air and regularly monitors drinking water, milk and precipitation for environmental radiation. The RadNet online searchable database contains historical data of environmental radiation monitoring data from all fifty states and U.S. territories.
- The FDA and USDA continues to ensure all our imported food remains safe as they do everyday
- If there were to be a nuclear accident here, we are prepared to respond and FEMA and the Department of Homeland Security exercise these preparedness plans with the rest of the government and state and local officials as well. Release of radioactive materials can be accidental or intentional and we have a detailed plan to respond regardless of the cause. The Nuclear/Radiological Incident Annex to the National Response Framework outlines which department or agency would have the lead for the Federal response depending on the source and type of release. For example, the Nuclear Regulatory Commission (NRC) would coordinate a response to a release at nuclear power facilities licensed by the NRC. The Department of Energy would coordinate a response to a release involving nuclear weapons in DOE custody. The Department of Homeland Security would coordinate a response to a deliberate attack using improvised nuclear devices or radiological dispersal devices.
- Given the range of potential causes, from an earthquake to a terrorist attack, the plan provides the flexibility and agility we need to respond aggressively and effectively. In addition, state and local officials and nuclear facilities have detailed emergency plans that include specific protective actions, evacuation routes, and methods to alert the public of actions to take in the event of an emergency. There is a robust and active nuclear power plant accident exercise program that includes Federal, State, and local involvement to test plans and keep them current, and just last year we conducted such an exercise. Federal protective action guides are used at all nuclear power plants and are widely accepted and used in planning and exercises, and we will continue our efforts to plan and prepare for the safety and security of the American people.

Questions and Answers for OPA:

March 15, 2011; 8:50 pm

1. Can this happen here?

The events that have occurred in Japan are the result of a combination of highly unlikely natural disasters. These include the fifth largest earthquake in recorded history and the resulting devastating tsunami. It is highly unlikely that a similar event could occur in the United States.

2. I live near a nuclear power plant similar to the ones having trouble in Japan. How can we now be confident that this plant won't experience a similar problem?

U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes and tsunamis. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster. The NRC requires that safety-significant structures, systems, and components be designed to take into account the most severe natural phenomena historically reported for the site and surrounding area. The NRC is confident that the robust design of these plants makes it highly unlikely that a similar event could occur in the United States.

3. Has this crisis changed your opinion about the safety of U.S. nuclear power plants?

No. The NRC remains confident that the design of U.S. nuclear power plants ensures the continued protection of public health and safety and the environment.

4. With all this happening, how can the NRC continue to approve new nuclear power plants?

It is premature to speculate what, if any, effect the events in Japan will have on the licensing of new nuclear power plants.

5. What is the NRC doing in response to the situation in Japan?

The NRC has taken a number of actions:

- a. Since the beginning of the event, the NRC has continuously manned its Operations Center in Rockville, MD in order to gather and examine all available information as part of the effort to analyze the event and understand its implications both for Japan and the United States.
- b. A team of 11 officials from the NRC with expertise in boiling water nuclear reactors have deployed to Japan as part of a U.S. International Agency for International Development (USAID) team.

- c. The NRC has spoken with its counterpart agency in Japan, offering the assistance of U.S. technical experts.
- d. The NRC is coordinating its actions with other Federal agencies as part of the U.S. government response.

6. What other U.S. agencies are involved, and what are they doing?

The entire federal family is responding to this event. The NRC is closely coordinating its efforts with the White House, DOE, DOD, USAID, and others. The U.S. government is providing whatever support requested by the Japanese government.

7. What else can go wrong?

The NRC is continuously monitoring the developments at the nuclear power plants in Japan. Circumstances are constantly evolving and it would be inappropriate to speculate on how this situation might develop over the coming days.

8. What is the worst-case scenario?

In a nuclear emergency, the most important action is to ensure the core is covered with water to provide cooling to remove any heat from the fuel rods. Without adequate cooling, the fuel rods will melt. Should the final containment structure fail, radiation from these melting fuel rods would be released to the atmosphere and additional protective measures may be necessary depending on factors such as prevailing wind patterns.

9. The United States has troops in Japan and has sent ships to help the relief effort – are they in danger from the radiation?

The NRC is not the appropriate federal agency to answer this question. DOD is better suited to provide information regarding its personnel.

10. Is there a danger of radiation making it to the United States?

In response to nuclear emergencies, the NRC works with other U.S. agencies to monitor radioactive releases and predict their path. The NRC continues to monitor information regarding wind patterns near the Japanese nuclear power plants. Nevertheless, given the thousands of miles between the two countries, Hawaii, Alaska, the U.S. Territories and the U.S. West Coast are not expected to experience any harmful levels of radioactivity.

11. Is the U.S. government tracking the radiation released from the Japanese plants?

Yes, a number of U.S. agencies are involved in monitoring and assessing radiation including EPA, DOE, and NRC. The best source of additional information is the Environmental Protection Agency.

12. Has the government set up radiation monitoring stations to track the release?

The NRC understands that EPA is utilizing its existing nationwide radiation monitoring system, RadNet, to monitor continuously the nation's air and regularly monitors drinking water, milk and precipitation for environmental radiation. EPA has publicly stated its agreement with the NRC's assessment that we do not expect to see radiation at harmful levels reaching the U.S. from damaged Japanese nuclear power plants. Nevertheless, EPA has stated that it plans to work with its federal partners to deploy additional monitoring capabilities to parts of the western U.S. and U.S. territories.

13. The radiation "plume" seems to be going out to sea – what is the danger of it reaching Alaska? Hawaii? The west coast?

See response to Question 10.

14. I live in the Western United States – should I be taking potassium iodide (KI)?

At this time, the NRC does not believe that protective measures are necessary in the United States. We do not expect any U.S. states or territories to experience harmful levels of radioactivity. In the unlikely event that circumstances change, U.S. residents should listen to the protective action decisions of their states and counties. These protective action decisions could include actions such as sheltering, evacuation, or taking potassium iodide. The NRC will provide technical assistance to the states should they request it.

15. Are there other protective measures I should be taking?

At this time, the NRC does not believe that protective measures are necessary in the United States. We do not expect any U.S. states or territories to experience harmful levels of radioactivity. In the unlikely event that circumstances change, U.S. residents should listen to the protective action decisions of their states and counties. These protective action decisions could include actions such as sheltering, evacuation, or taking potassium iodide. The NRC will provide technical assistance to the states should they request it. United States citizens in Japan are encouraged to follow the protective measures recommended by the Japanese government. These measures appear to be consistent with steps the United States would take.

16. What are the risks to my children?

See response to Question 15.

- 17. My family has planned a vacation to Hawaii/Alaska/Seattle next week – is it safe to go, or should we cancel our plans?**

The NRC does not expect that residents of the United States or its territories are at any risk of exposure to harmful levels of radiation resulting from the events in Japan. Any changes to travel are a personal decision. The NRC is unaware of any travel restrictions within the United States or its territories.

- 18. What are the short-term and long-term effects of exposure to radiation?**

The NRC does not expect that residents of the United States or its territories are at any risk of exposure to harmful levels of radiation resulting from the events in Japan.

On a daily basis, people are exposed to naturally occurring sources of radiation, such as from the sun or medical X-rays. The resulting effects are dependent on the strength and type of radiation as well as the duration of exposure.

- 19. I am traveling to Asia (not Japan). Should I adjust my travel plans to avoid flying through plume or being contaminated once on the ground?**

The NRC is not the responsible federal agency to advise U.S. citizens on foreign travel restrictions. That responsibility belongs to the Department of State.

- 20. What is the official agency to report radiation numbers and what is the public contact?**

NRC regulations require nuclear power plants to report any radiation doses detected at the plant that could be harmful to the public. This would include doses that are generated by the plant or by an external source. During an event in the U.S., it is the state's responsibility to provide protective action decisions for public health and safety. For this incident, the Japanese are responsible for reporting the public dose; nevertheless, should radiation doses be detected within the U.S., it would still be the state's responsibility to provide protective action decisions for public health and safety.

- 21. How many plants are located in seismic areas?**

Although we often think of the US as having "active" and "non-active" earthquake zones, earthquakes can actually happen almost anywhere. Seismologists typically separate the US into low, moderate, and high seismicity zones. The NRC requires that every plant be designed for site-specific ground motions that are appropriate for their location. In

addition, the NRC has specified a minimum ground shaking level to which the plants must be designed.

22. Where would I get IOSAT Potassium Iodide if my city should experience fallout from the Japanese nuclear disaster? Is this the right precaution or is there anything else that can be done to protect myself?

We do not expect any U.S. states or territories to experience harmful levels of radioactivity. As such, we do not believe that there is any need for residents of the United States to take potassium iodide. U.S. residents should listen to the protective action decisions by their states and counties. If necessary, protective action decisions could include actions such as sheltering, evacuating, or taking potassium iodide.

Additional information regarding the use of potassium iodide can be found on NRC's webpage at the following link:

<http://www.nrc.gov/about-nrc/emerg-preparedness/about-emerg-preparedness/potassium-iodide-use.html>

Since Potassium Iodide is classified as a drug, Additional information is on the Food and Drug Administration's web site. www.fda.gov

23. My loved one is overseas, how do I find out if they are ok?

We are directing public inquiries with regard to concern for loved ones overseas to the State Department, Consular Services at 202-647-7004.

NOT FOR PUBLIC DISCLOSURE

Questions and Answers for Chairman Jaczko

March 11, 2011 Japan Earthquake/Tsunami Aftermath
As of 11:30 a.m. 3/15/2011

1. What is the NRC doing about the emergencies at the nuclear power plants in Japan? Are you sending staff over there?

Public Answer: We are closely following events in Japan, working with other agencies of the federal government, and have been in direct contact with our counterparts in that country. We have sent a total of 11 staff to Tokyo in response to the Japanese government's request for assistance. Two of those NRC staff members, knowledgeable about boiling water reactors, are already in Japan participating in the USAID team.

Additional technical, non-public information:

We are taking the knowledge that the staff has about the design of the US nuclear plants and we are applying this knowledge to the Japan situation. For example, this includes calculations of severe accident mitigation that have been performed. Tony Ulses and Jim Trapp are in-country. Team led by Chuck Casto enroute from various locations.

2. What's going to happen following the hydrogen explosions everyone's seen from the video footage?

Public Answer: The NRC is aware of the Japanese efforts to stabilize conditions at the affected reactors, and those actions are in line with what would be done in the United States. The NRC continues to monitor information on the status of the reactor core, the reactor vessel and the containment structure – all three areas are important to controlling the situation and protecting the public.

Additional technical, non-public information:

The explosions affected the secondary containment buildings for Units 1 and 3 of the reactor plant. The primary containment was unaffected by the explosion. This does expose the spent fuel pools to atmosphere but should not affect the integrity of the spent fuel pool. With the integrity of the Secondary Containment breached it is more essential to maintain Primary Containment intact.

To provide additional protection to Primary Containment, US reactors of the containment type similar to Fukushima Unit 1 installed a hardened vent line from primary containment directly to the vent stack. A hardened vent provides a release path which would prevent an overpressurization of containment as experienced at Fukushima Unit One. Venting from the hardened vent is typically a manual operation that is controlled by the Emergency Operating Procedures as a last resort to protect the containment from failure. This vent path can be directly from the upper containment or from the torus (the preferred vent path due to scrubbing effect of the torus water).

3. What should be done to protect people in Alaska, Hawaii and the West Coast from radioactive fallout?

Public Answer: The NRC continues to believe that the type and design of the Japanese reactors, combined with how events have unfolded, will prevent radiation at harmful levels from reaching U.S. territory.

Additional technical, non-public information: NRC is working with DHS, EPA and other federal partners to ensure monitoring equipment for confirmatory readings is properly positioned, based on meteorological and other relevant information.

Questions and Answers developed by Rob Taylor

4. Can this happen here i.e. an earthquake that significantly damages a nuclear power plant? Are the Japanese plants similar to U.S. plants?

Public Answer: All U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes and tsunamis. Even those plants that are located in areas with low and moderate seismic activity are designed for safety in the event of such a natural disaster. The NRC requires that safety-significant structures, systems, and components be designed to take into account even very rare and extreme seismic and tsunami events.

The Japanese facilities are similar in design to several US facilities.

Additional technical, non-public information:

Currently operating reactors were designed using a "deterministic" or "maximum credible earthquake" approach. Seismic hazard for the new plants is determined using a much more robust probabilistic seismic hazard assessment approach that explicitly addresses uncertainty and very rare events, as described in RG1.208. The NRC requires that adequate margin beyond the design basis ground shaking levels is assured. The NRC further enhances seismic safety for beyond-design-basis events through the use of a defense-in-depth approach.

In addition, the NRC periodically reviews the seismic risk at operating reactors when information may have changed. Over the last few years the NRC has undertaken a program called Generic Issue 199, which is focused on assessing hazard for plants in the central and eastern US using the latest techniques (developed in part during reviews of Western U.S. plants) and determining the possible risk implications of any increase in the anticipated ground shaking levels. This program will help us assure that the plants are safe under exceptionally rare and extreme ground motions that represent beyond-design-basis events.

5. What would U.S. plants do in this situation?

Public Answer: The NRC requires plant designs to include multiple and diverse safety systems, and plants must test their emergency preparedness capabilities on a regular basis. Plant operators are very capable of responding to significant events. In addition, NRC regulations require plants to have plans in place that would allow them to mitigate even "worst case scenarios".

Since 9/11, we have implemented requirements for licensees to have additional response capabilities for extreme situations.

Additional technical, non-public information:

U.S. nuclear plants have procedures in place to address a variety of accident scenarios, including abnormal operating procedures, emergency operating procedures, severe accident management guidelines and emergency plans. Additionally, the NRC activates Incident Response centers in Headquarters and individual Regions as necessary for the event to provide technical monitoring and support.

The NRC is capable of providing access to many external agencies (i.e., FEMA, Homeland Security, Military, etc.) to provide any additional help that individual plant sites may need. Additionally, the NRC has access to real-time plant information through the ERDS System for each site in the US and can monitor the status anytime.

6. Are U.S. power plants designed to withstand tsunamis?

Public Answer: Yes. Plants are built to withstand a variety of environmental hazards. Those plants that might face a threat from tsunami are required to withstand large waves and the maximum and minimum wave heights at the intake structure (which varies by plant.)

Additional, technical, non-public information:

Tsunami have been considered in the design of US nuclear plants since the publication of Regulatory Guide 1.59 in 1977, although the approaches that were used for design of the existing plants varied significantly. Nuclear plants are designed to withstand flooding from not only tsunami, but also hurricane and storm surge; therefore there is often significant margin against tsunami flooding. However, it should be noted that Japanese experience has shown that drawdown can be a significant problem. Drawdown was not generally analyzed in the past.

Currently the US NRC has a tsunami research program that is focused on developing modern hazard assessment techniques and additional guidance through cooperation with the National Oceanic and Atmospheric Administration and the United States Geological Survey. This has already lead to several technical reports and an update to NUREG 6-800. The NOAA and USGS contractors are also assisting with NRC reviews of tsunami hazards. A new regulatory guide on tsunami hazard assessment is currently planned in the office of research, although it is not expected to be available in draft form until 2012.

7. What happens when a plant "melts down"?

Public Answer: In short, nuclear power plants in the United States are designed to be safe. To prevent the release of radioactive material, there are multiple barriers between the radioactive material and the environment, including the fuel cladding, the heavy steel reactor vessel itself and the containment building, usually a heavily reinforced structure of concrete and steel several feet thick.

Additional, technical, non-public information:

The melted core may melt through the bottom of the vessel and flow onto the concrete containment floor. The core may melt through the containment liner and release radioactive material to the environment.

8. Why is KI administered during nuclear emergencies?

Public Answer: KI – potassium iodide – is one of the protective measures that might be taken in a radiological emergency in this country. A KI tablet will saturate the thyroid with non radioactive iodine and prevent the absorption of radioactive iodine that could be part of the radioactive material mix of radionuclides in a release. KI does not prevent exposure from these other radionuclides.

Additional, technical non-public information.

There are a range of protective measures that we use ... the most effective is evacuation. Local government officials are responsible for determining the best means to protect their public. KI is another means for protection but evacuation and sheltering are the primary means that are used.

9. Was there any damage to U.S. reactors from either the earthquake or the resulting tsunami?

Public Answer: No

Additional, technical non-public information: Diablo Canyon Units 1 and 2 were the only US plants to declare any type of an emergency classification. The site entered an "unusual event" based on a tsunami warning from the State, NOAA, NWS, Coast Guard or System Dispatcher following the Japanese earthquake. They have since exited the "unusual event" declaration, based on a downgrade to a tsunami advisory.

10. Has this incident changed the NRC perception about earthquake risk?

Public Answer: There has been no change in the NRC's perception of earthquake hazard (i.e. ground shaking levels) for US nuclear plants. As is prudent, the NRC will certainly be looking closely at this incident and the effects on the Japanese nuclear power plant in the future to see if any changes are necessary to NRC regulations.

Additional, technical, non-public information.

We expect that there would be lessons learned, etc. It appears that the sites did not have any critical damage due to the earthquake from the fact that the emergency diesel generators initially responded to provide power to the site. The tsunami and consequential site flooding was responsible for the complete loss of power to the site, including the diesel generators which resulted in a Station Blackout.

11. Will this incident affect new reactor licensing?

Public Answer: It is not appropriate to hypothesize on such a future scenario at this point.

Additional, technical non-public information:

This event could potentially call into question the NRC's seismic requirements which could require the staff to re-evaluate the staff's approval of the AP1000 and ESBWR design and certifications.

12. What magnitude earthquake are US plants designed to?

Public Answer: Each plant is designed to a ground-shaking level that is appropriate for its location, given the possible earthquake sources that may affect the site and its tectonic environment. Ground shaking is a function of both the magnitude of an earthquake and the distance from the fault plane to the site. The probabilistic approaches currently used by the NRC account for a large number of different magnitudes.

Additional, technical non-public information:

In the past, "deterministic" or "scenario based" analyses were used to determine ground shaking (seismic hazard) levels. Now a probabilistic method is used that accounts for all possible earthquakes coming from all possible sources (including background seismicity) and the likelihood that each particular hypothetical earthquake occurs.

13. How many US reactors are located in active earthquake zones (and which reactors)?

Public Answer: Although we often think of the US as having "active" and "non-active" earthquake zones, earthquakes can actually happen almost anywhere. Seismologists typically separate the US into low, moderate, and high seismicity zones. The NRC requires that every plant is designed for site-specific ground motions that are appropriate for their location. In addition, the NRC has specified a minimum ground shaking level to which the plants must be designed.

Additional, technical non-public information: No additional.

14. How many reactors are along coastal areas that could be affected by a tsunami (and which ones)?

Public Answer: Many plants are located in coastal areas that could theoretically be affected by tsunami. Two plants, Diablo Canyon and San Onofre, are on the Pacific Coast, which is known to have tsunami hazard. There are also two plants on the Gulf Coast, South Texas and Crystal River. There are many plants on the Atlantic Coast or on rivers that may be affected by a tidal bore. These include St. Lucie, Turkey Point, Brunswick, Oyster Creek, Millstone, Pilgrim, Seabrook, Calvert Cliffs, Salem/Hope Creek, and Surry. Tsunami on the Gulf and Atlantic Coasts occur, but are very rare. Generally the flooding anticipated from hurricane storm surge exceeds the flooding expected from a tsunami for plants on the Atlantic and Gulf Coast.

Additional, technical non-public information: None

15. How many U.S. plants have designs similar to the affected Japanese reactors (and which ones)?

Public answer: Thirty-five of the 104 operating nuclear power plants in the U.S. are boiling water reactors (BWRs), as are the reactors at Fukushima. Twenty-three of the U.S. BWRs have the same Mark I containment as the Fukushima reactors.

Four of the U.S. BWRs are early designs which are similar to Fukushima Unit 1.

Nineteen U.S. BWRs are similar to Fukushima Unit 3.

Additional Information

Fukushima Unit 1 is a BWR-3 with a Mark 1 containment similar to Oyster Creek, Nine Mile Point Unit 1, and Dresden Units 2 and 3.

Fukushima Unit 3 is a BWR-4 with a Mark 1 containment and a Reactor Core Isolation Cooling (RCIC) system. The remaining 31 U.S. BWRs use a Reactor Core Isolation Cooling (RCIC) system instead of an isolation condenser. Nineteen of those 31 reactors have a Mark 1 containment, while the remainder are more recent designs.

16. What resources are the Japanese asking for?

The Japanese have formally requested equipment needed to cool the reactor fuel. This includes such things as pumps, fire hoses, portable generators, and diesel fuel. The NRC is coordinating with General Electric, which has plant design specifications, to ensure any equipment provided will be capable of meeting the needs of the Japanese.

17. What should the American public know about the incident in Japan?

The events unfolding in Japan are the result of a catastrophic series of natural disasters. These include the fifth largest earthquake in recorded history and the resulting devastating tsunami. Despite these unique circumstances, the Japanese appear to have taken reasonable actions to mitigate the event and protect the surrounding population. Since the beginning of the event, the NRC has continuously manned its Operations Center in Rockville, MD in order to gather and examine all available information as part of the effort to analyze the event and understand its implications both for Japan and the United States.

18. What could you say about the dangers to the American public from our nuclear plants?

As the events in Japan continue to unfold, the NRC is focused on supporting the Japanese government and people in bringing this crisis to closure in the safest manner possible. The NRC remains convinced that U.S. nuclear power plants are designed and operated in a manner that protects public health and safety. The time will come, after this crisis is behind us, to evaluate what, if any, changes are needed at U.S. nuclear power plants. We will assess all the available information and, as we have done with previous natural disasters, such as the 2007 earthquake in the Sea of Japan and the 2004 tsunami in the Indian Ocean, evaluate whether enhancements to U.S. nuclear power plants are warranted.

19. What happens next in Japan? How long will it take to assess the damage to the reactors?

The current focus is ensuring that adequate cooling of the reactor fuel at each of the affected Japanese reactors is established and maintained. In the days, weeks, and months that follow, there will be adequate time to assess the damage and determine next steps.

20. Compare this incident to the Three Mile Island. What are the similarities?

The events at Three Mile Island in 1979 were the result of an equipment malfunction that resulted in the loss of cooling water to the reactor fuel. Subsequent operator actions compounded the malfunction ultimately resulting in the partial core meltdown. While details are still developing, the events in Japan appear to be the result of an earthquake and subsequent tsunami that knocked out electrical power to emergency safety systems designed to cool the reactor fuel. In both events the final safety barrier, the containment building, contained the majority of the radioactivity preventing its release to the environment.

21. Why did the seawater fail to cool the reactor?

Based on information available to the NRC, it appears that the seawater has been effective at providing some cooling for the reactor. While it appears that some fuel damage has occurred, there will be plenty of time once this crisis is resolved to determine the effectiveness of the measures taken in response to this event.

22. If Chernobyl was a 7 and Three Mile Island was a 5, when does this event move from the 4 level?

The International Atomic Energy Agency (IAEA) rates nuclear events in accordance with its International Nuclear and Radiological Event Scale (INES). IAEA has assigned the events in Japan an INES rating of 4, "Accident with Local Consequences." This rating is subject to change as events unfold and additional information becomes available. INES classifies nuclear accidents based on the radiological effects on people and the environment and the status of barriers to the release of radiation. IAEA determinations regarding the INES rating of events are made independently.

Three Mile Island was assigned an INES rating of 5, "Accident with Wider Consequences," due to the severed damage to the reactor core.

23. Are any Americans in danger – armed forces, citizens in Tokyo?

The NRC, in consultation with the White House and U.S. Embassy, has advised United States citizens in Japan to follow the protective measures recommended by the Japanese government. These measures appear to be consistent with steps the United States would take. The Department of Defense has personnel trained in radiation protective measures and is responsible for providing guidance to U.S. armed forces. Inquiries regarding U.S. citizens in Japan should be directed to the State Department, Consular Services at 202-647-7004.

24. What is the worst case scenario for the plant?

In a nuclear emergency the most important action is ensure the core is covered with water to provide cooling to remove any heat from the fuel rods. Without adequate cooling, the fuel rods will melt. Should the final containment structure fail, radiation from these melting fuel rods would be released to the atmosphere and additional protective measures may be necessary, depending on factors such as prevailing wind patterns.

25. As time goes on, does the chance for a meltdown increase?

Not necessarily. Each passing hour the fuel rods will become cooler. If adequate cooling can be established and maintained, the risk of a meltdown will be mitigated.

26. Is our battery backup power less effective than the Japanese?

No. US regulations do not specify the length of time that you need to have the batteries operate following a loss of offsite power (most sites plan to have battery backup capability for 8 hours). Instead, the amount of time is dependent on the site recovery strategy and is based on

providing sufficient capacity to assure that the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

27. Are we providing additional KI to the Japanese?

We have not been asked to provide KI.

28. What are US plants required to have for backup power? More than what the Japanese reactors did?

US plants need to meet 10 CFR 50 Appendix A criterion 17. Reactor units must have 2 independent power supplies. All US (except Oconee) plants have diesels and battery backup systems. Most of the US plants with diesels have two diesels per unit and those that have only one dedicated diesel have a swing diesel available. The regulations do not specify the length of time that you need to have the diesels and batteries operate following a loss of offsite power (most sites plan to run the diesels for multiple days and have battery backup capability for 8 hours). Instead the amount of time is dependent on the site recovery strategy and is based on providing sufficient capacity to assure that the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

[[[Japanese regulations to follow from OIP.]]]

29. Some in the media and in Hill briefings are suggesting that Mark 1 containment is flawed. What are the concerns about this type of containment? Are the US plants with this safe?

BWR Mark I containments have relatively small volumes in comparison with PWR containments. This makes the BWR Mark I containment relatively more susceptible to containment failure given a core meltdown severe enough to (1) fail the reactor vessel and also (2) severe enough so that the core melt reaches the containment boundary. On the positive side, BWRs have more ways of adding water to the core than PWRs. This includes 2 water injection sources which do not rely on AC electric power. These systems include Reactor Core Isolation Cooling (RCIC) and High pressure coolant injection (HPCI).

The NRC considers BWRs with Mark I containment designs to be safe.

30. Any quick-hit info about how the Southeast Reactors performed during Katrina? What damage did the flood water do? Any power loss?

The reactors performed as designed. Waterford was the most impacted while River Bend also experienced some effects.

Waterford 3 (near New Orleans, LA) did not have damage to any safety equipment during, or shortly after Katrina. They shut down on August 28, 2005, in advance of the hurricane strike. The flooding did affect local infrastructure, including communications and power distribution. However, the plant successfully used their emergency diesel generators to furnish plant power. Access was maintained to the plant throughout the event. On September 9, 2005, after a comprehensive review by FEMA and the NRC, the plant was authorized to restart.

River Bend Station (30 miles north of Baton Rouge, LA) did not experience damage to any safety related equipment and only minimal damage to emergency planning equipment (one siren) during and after Hurricane Katrina. The station reduced power to 70 percent core thermal power on August 28, 2005, due to reduced electrical grid loads. Access was maintained to the plant throughout the event. On September 2, 2005, the plant returned to 100% power.

Also, in 1992 the eye of Hurricane Andrew, a category 5 hurricane, passed directly over the Turkey Point nuclear plant. The plant was shut down prior to the hurricane making landfall and an assessment of the plant following the hurricane demonstrated that the plant sustained very little damage and all of the safety equipment was intact. (Most of the damage was to the security fences being blown down).

31. With NRC moving to design certification, at what point is seismic capability tested – during design or modified to be site-specific? If in design, what strength seismic event must these be built to withstand?

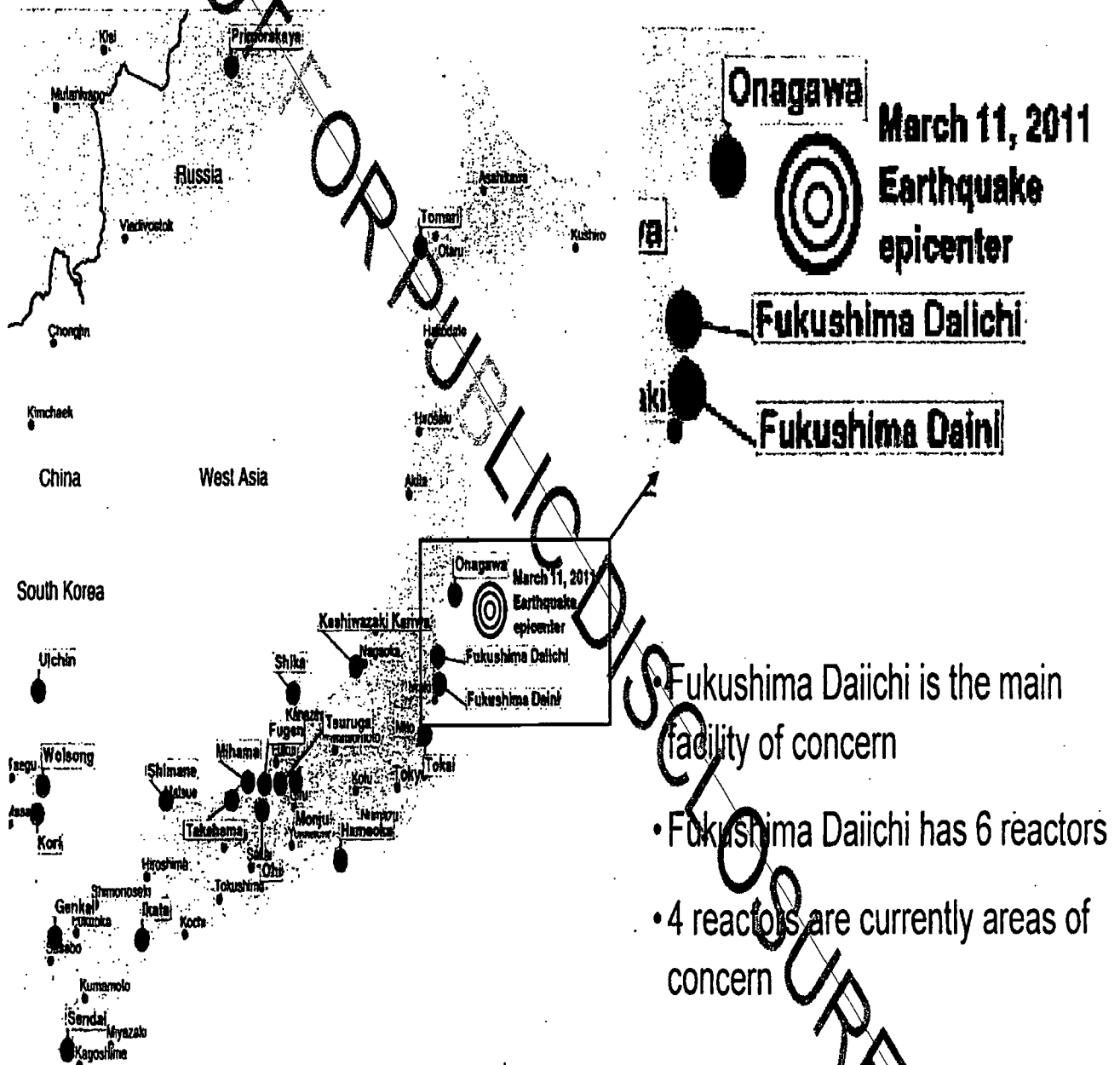
The regulations related to seismic requirements are contained in 10 CFR 50 Appendix A criterion 2.

During design certification, vendors propose a seismic design in terms of a ground motion spectrum for their nuclear facility. This spectrum is called a standard design response spectrum and is developed so that the proposed nuclear facility can be sited at most locations in the central and eastern United States. The vendors show that this design ground motion is suitable for a variety of different subsurface conditions such as hard rock, deep soil, or shallow soil over rock. Combined License and Early Site Permits applicants are required to develop a site specific ground motion response spectrum that takes into account all of the earthquakes in the region surrounding their site as well as the local site geologic conditions. Applicants estimate the ground motion from these postulated earthquakes to develop seismic hazard curves. These seismic hazard curves are then used to determine a site specific ground motion response spectrum that has a maximum annual likelihood of 1×10^{-4} of being exceeded. This can be thought of as a ground motion with a 10,000 year return period. This site specific ground motion response spectrum is then compared to the standard design response spectrum for the proposed design. If the standard design ground motion spectrum envelopes the site specific ground motion spectrum then the site is considered to be suitable for the proposed design. If the standard design spectrum does not completely envelope the site specific ground motion spectrum, then the COL applicant must do further detailed structural analysis to show that the design capacity is adequate. Margin beyond the standard design and site specific ground motions must also be demonstrated before fuel loading can begin.



Official Use Only

Japan Nuclear Facilities



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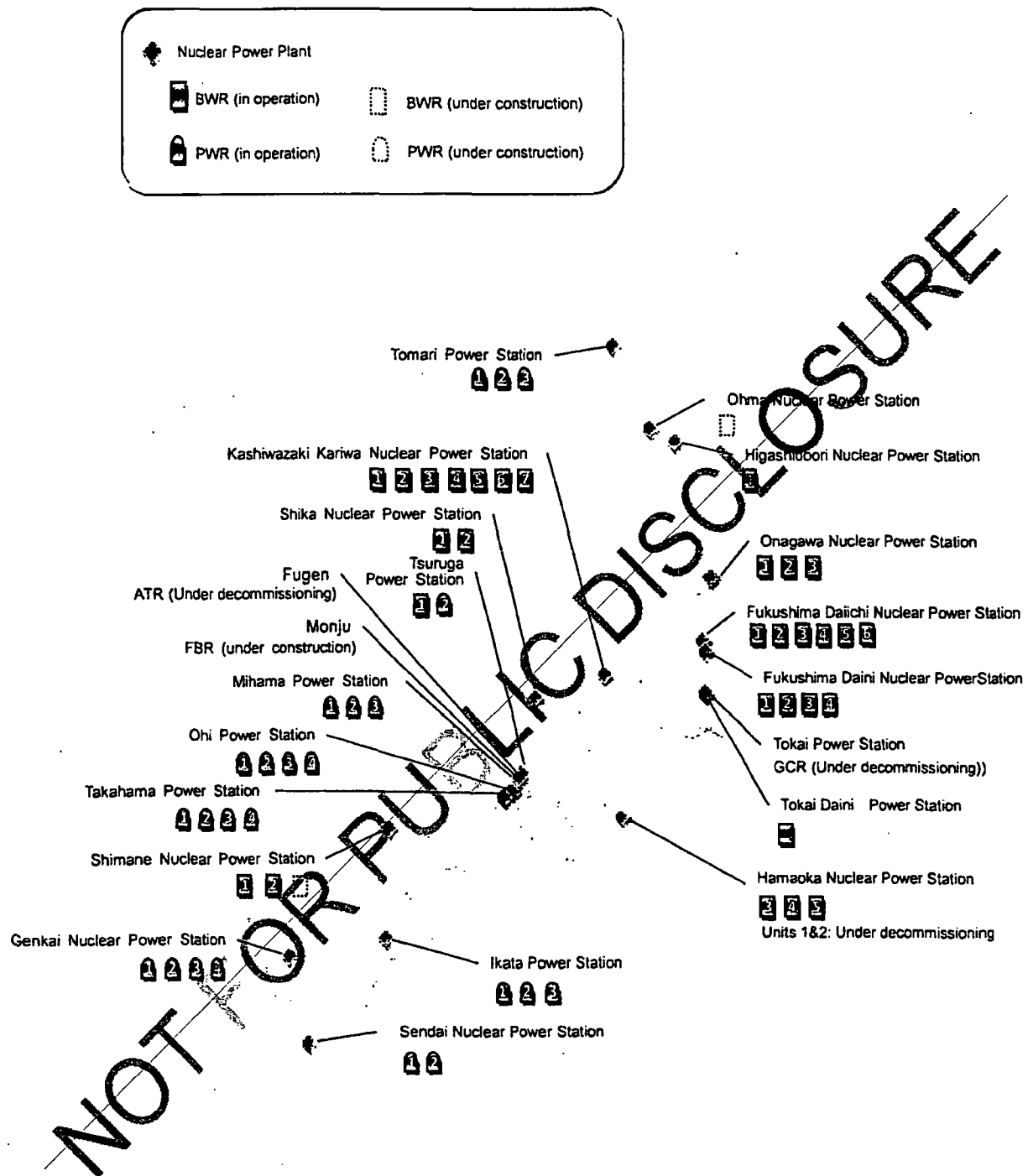


Fig. A-2 Locations of Nuclear Installations

Nuclear Power Plants in Japan

Tokyo Electric Power Co.-

Kashiwazaki Kanwa



Hokuriku Electric Power Co.-Shika



The Japan Atomic Power Co.-Tsuruga



The Kansai Electric Power Co.-Mihama



The Kansai Electric Power Co.-Oni



The Kansai Electric Power Co.-Takahama



The Chugoku Electric Power Co.-Shimane



The Chugoku Electric Power Co.-Kaminokuni



Kyushu Electric Power Co.-Genkai



Kyushu Electric Power Co.-Sendai



Electric Power Development Co.-Ohma



Tohoku Electric Power Co.-Higashidori



Tohoku Electric Power Co.-Moku

Hokkaido Electric Power Co.-Tomari



Tohoku Electric Power Co.-Onagawa



Tokyo Electric Power Co.-Fukushima Daiichi



Tokyo Electric Power Co.-Fukushima Daini



The Japan Atomic Power Co.-Toka
Closed (Mar. 1998)

The Japan Atomic Power Co.-Toka Dair



Chubu Electric Power Co.-Hamaoka



Shikoku Electric Power Co.-Ikata



Output scale



Under 1,000MW



Over 1,000MW



Over 1,000MW



Operating



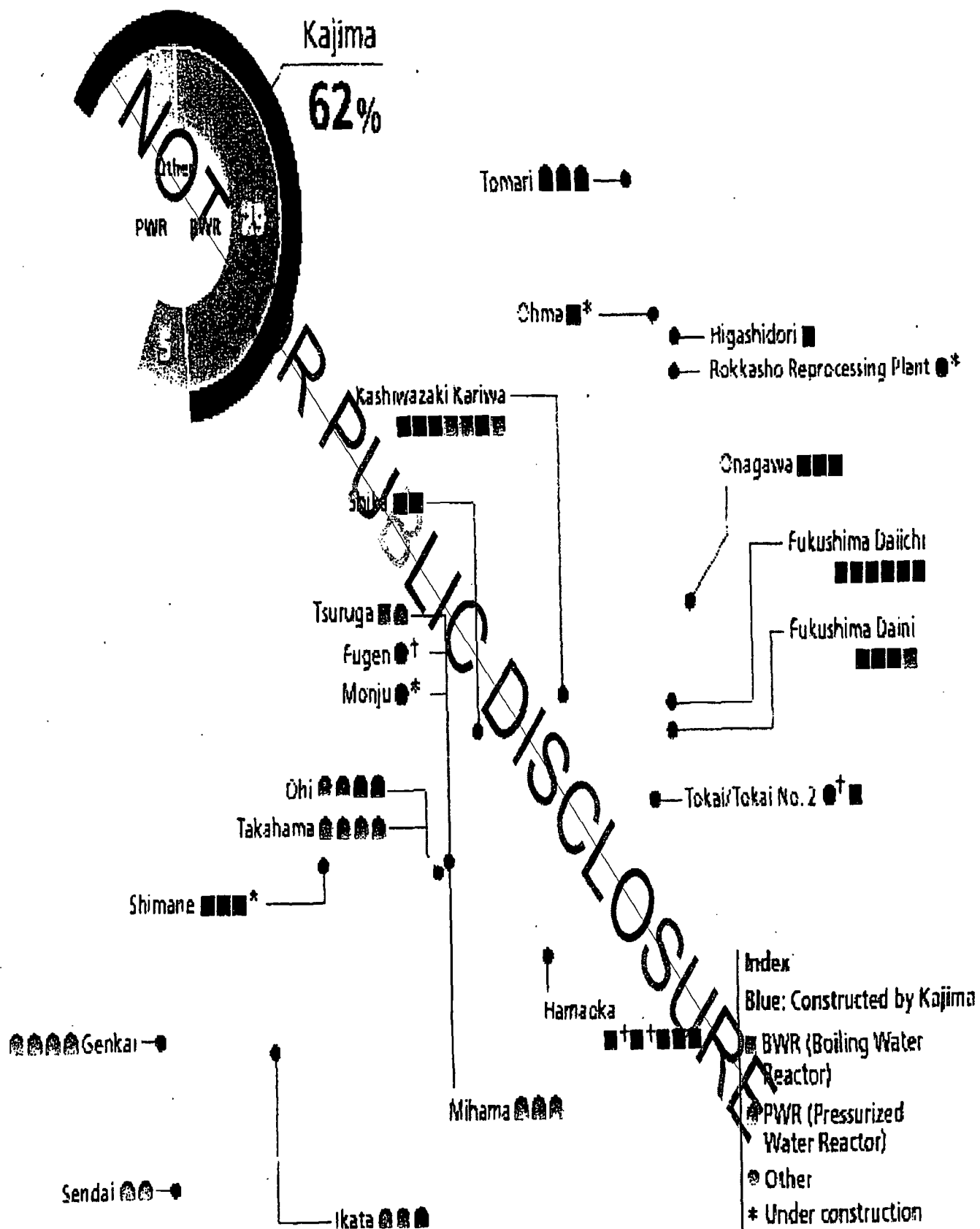
Under construction



Preparing for construction

	Number of Units	Total Output (MW)
Operating	33	23,760
Under construction	1	1,000
Preparing for construction	6	10,318
Total	40	35,078

Nuclear Power Facility Construction Track Record



1007-2
BWR 4/5/6
F-DAICHI 2

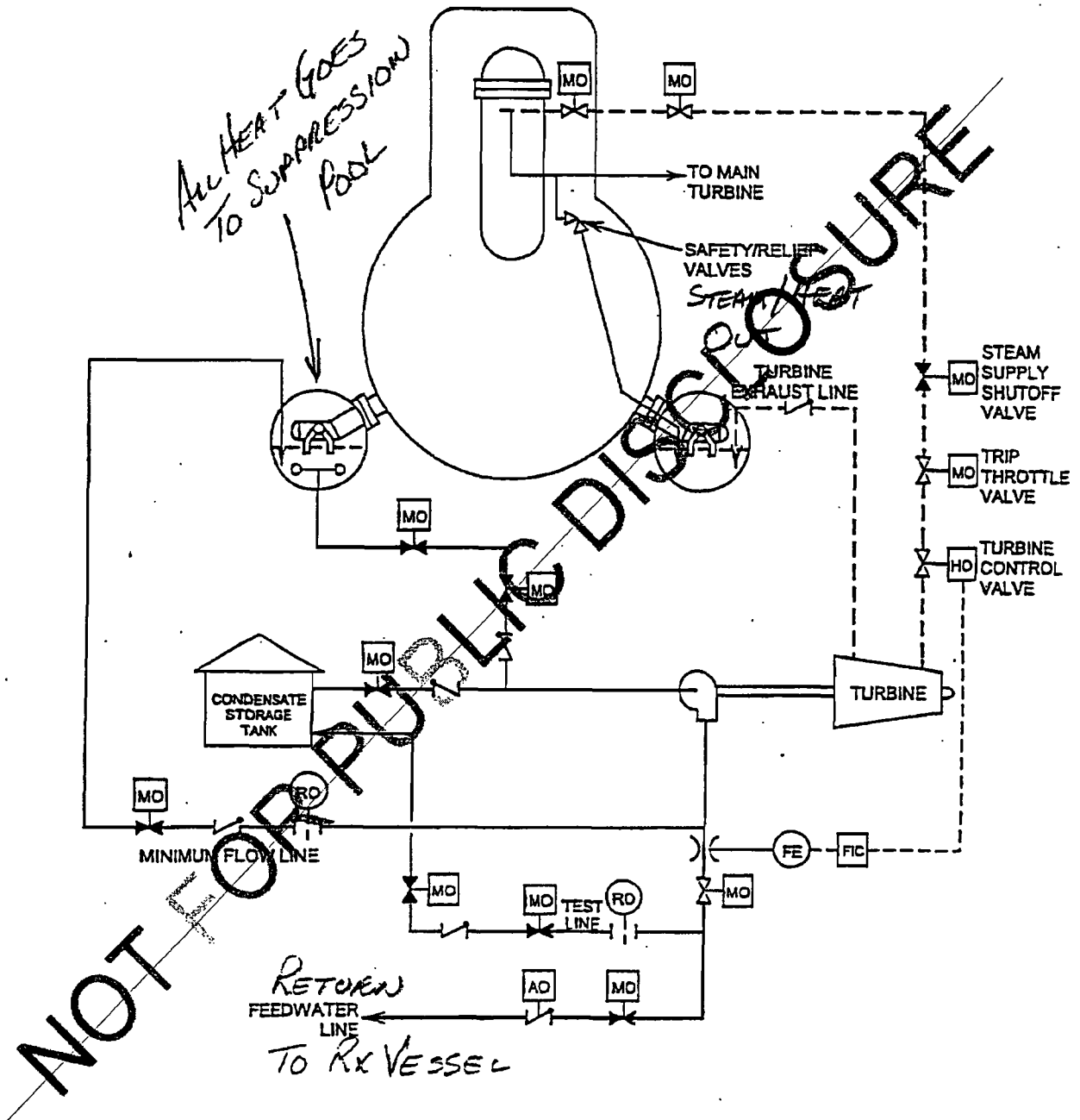


Figure 2.7-1 Reactor Core Isolation Cooling System

A Severe Accident involves Core Degradation

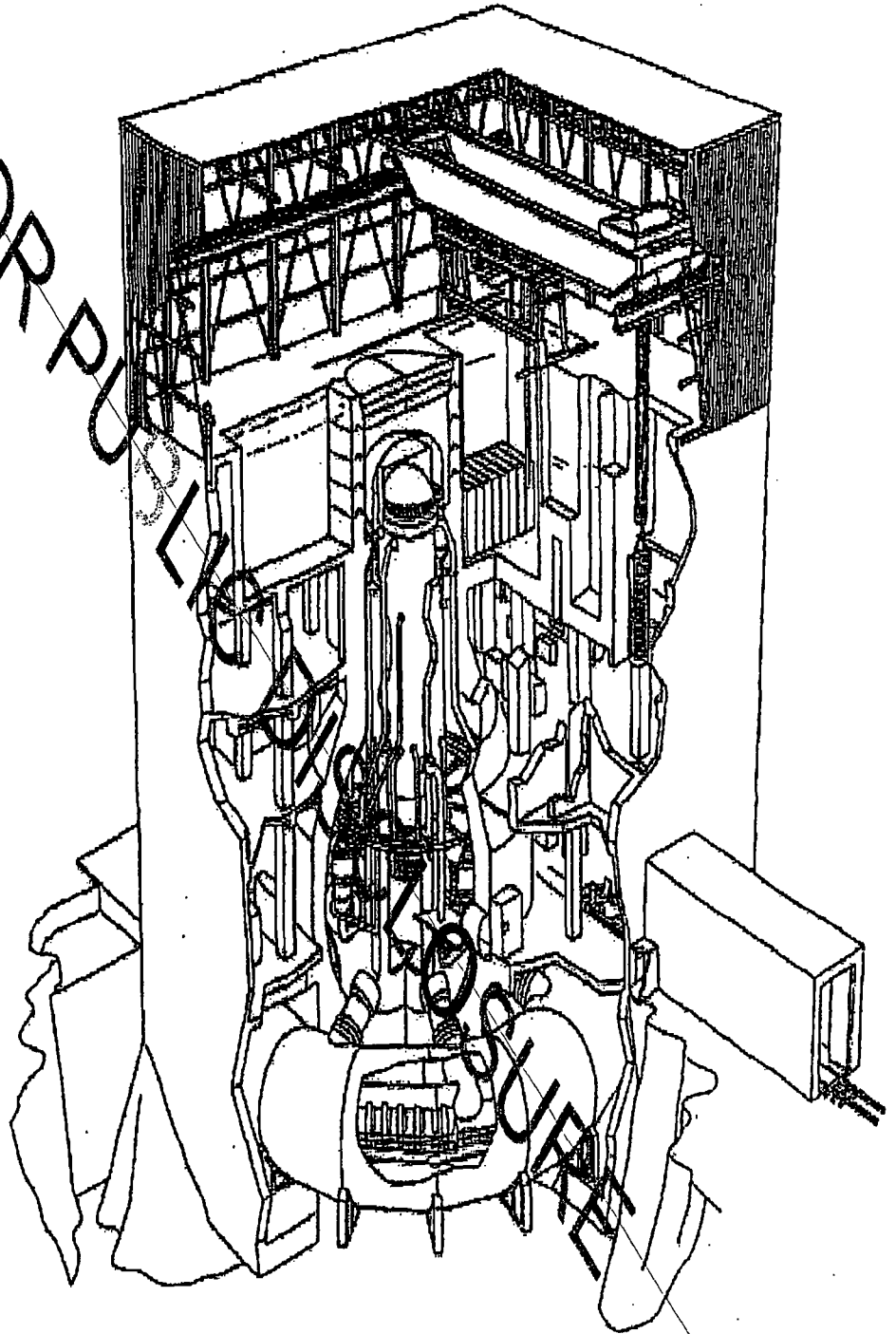
Core melting / degradation
have occurred in
Fukushima Daiichi Unit 1.

At this stage,

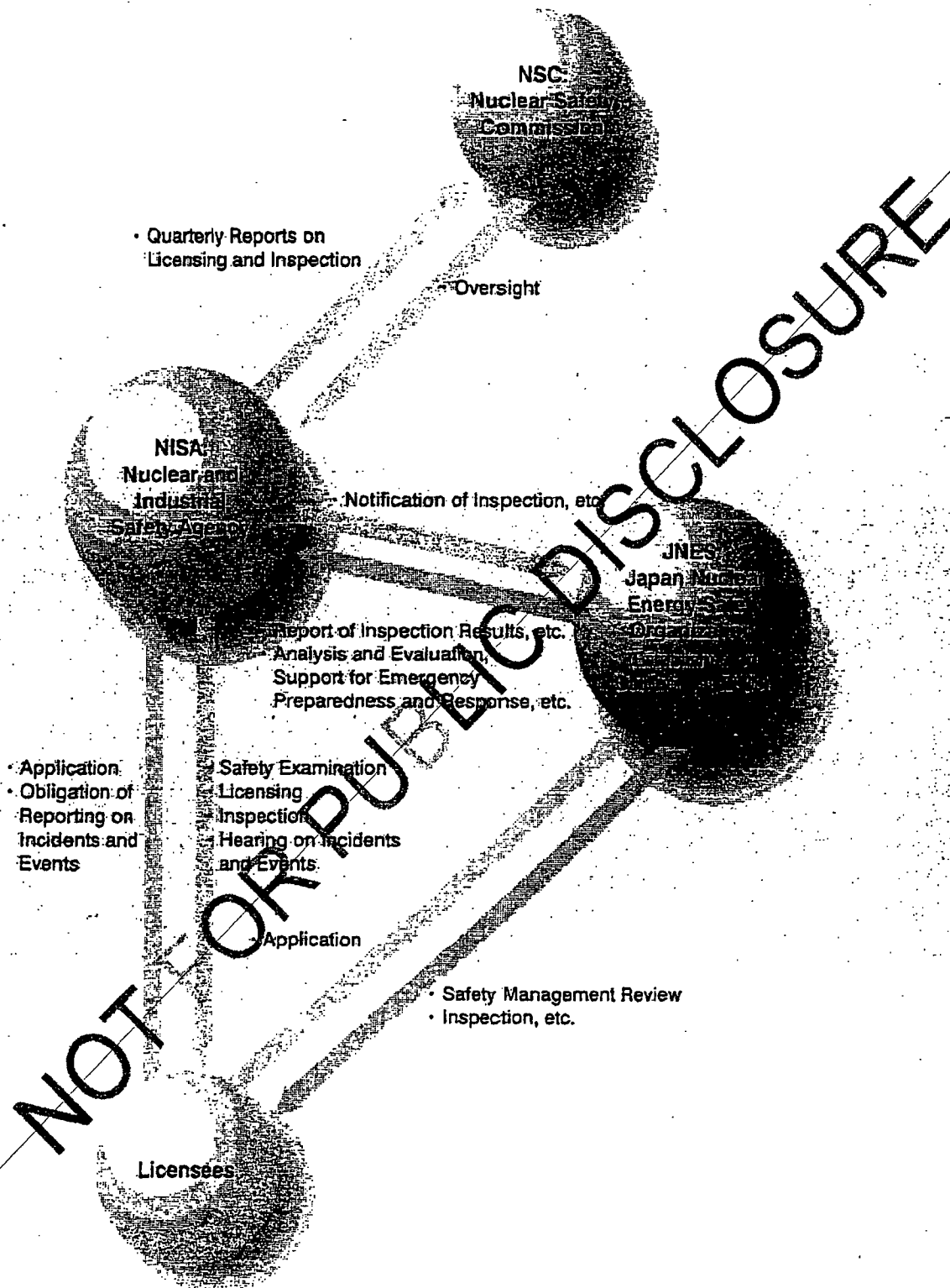
Safety Objectives:

Minimize and control
radioactivity release to
the environment, by

- maintaining integrity of
containment boundary
- retaining coolable
configuration of corium
inside the reactor pressure
vessel (lower head)



Safety Regulation System





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U.S. NUCLEAR REGULATORY COMMISSION

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Blog: <http://public-blog.nrc-gateway.gov>

No. 11-050

March 16, 2011

NRC PROVIDES PROTECTIVE ACTION RECOMMENDATIONS BASED ON U.S. GUIDELINES

Under the guidelines for public safety that would be used in the United States under similar circumstances, the NRC believes it is appropriate for U.S. residents within 50 miles of the Fukushima reactors to evacuate.

Among other things, in the United States protective actions recommendations are implemented when projected doses could exceed 1 rem to the body or 5 rem to the thyroid. A rem is a measure of radiation dose. The average American is exposed to approximately 620 millirems, or 0.62 rem, of radiation each year from natural and manmade sources.

In making protective action recommendations, the NRC takes into account a variety of factors that include weather, wind direction and speed, and the status of the problem at the reactors.

Attached are the results of two sets of computer calculations used to support the NRC recommendations.

In response to nuclear emergencies, the NRC works with other U.S. agencies to monitor radioactive releases and predict their path. All the available information continues to indicate Hawaii, Alaska, the U.S. Territories and the U.S. West Coast are not expected to experience any harmful levels of radioactivity.

###

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15 March 2010 02:51am (EDT), NRC Operations Center, Protective Measures Team

This data is based on system condition estimates for a hypothetical, single reactor site, 2350 MWt, Boiling Water Reactor. Model results are projections only and may not be representative of an actual release. This projection uses modeled forecast meteorological conditions and is subject to change.

Maximum Dose Values (rem) - Close-In

Dist from release miles (kilometers)	0.5 (0.8)	1. (1.61)	1.5 (2.41)	2. (3.22)	3. (4.83)	5. (8.05)	7. (11.27)	10. (16.09)
Total EDE	<u>5.4E+03</u>	<u>2.0E+03</u>	<u>1.2E+03</u>	<u>8.2E+02</u>	<u>4.8E+02</u>	<u>2.4E+02</u>	<u>1.6E+02</u>	<u>9.5E+01</u>
Thyroid CDE	<u>2.8E+04</u>	<u>1.1E+04</u>	<u>6.2E+03</u>	<u>4.3E+03</u>	<u>2.5E+03</u>	<u>1.3E+03</u>	<u>8.4E+02</u>	<u>6.1E+02</u>
Inhalation CEDE	<u>3.7E+03</u>	<u>1.4E+03</u>	<u>8.0E+02</u>	<u>5.6E+02</u>	<u>3.3E+02</u>	<u>1.7E+02</u>	<u>1.1E+02</u>	<u>6.3E+01</u>
Cloudshine	<u>1.9E+01</u>	<u>9.3E+00</u>	<u>5.8E+00</u>	<u>4.1E+00</u>	<u>2.5E+00</u>	<u>1.4E+00</u>	<u>9.7E+01</u>	<u>6.2E+01</u>
4-day Groundshine	<u>1.7E+03</u>	<u>6.5E+02</u>	<u>3.8E+02</u>	<u>2.6E+02</u>	<u>1.5E+02</u>	<u>7.3E+01</u>	<u>4.6E+01</u>	<u>2.8E+01</u>
Inter Phase 1st Yr	<u>2.4E+04</u>	<u>9.4E+03</u>	<u>5.4E+03</u>	<u>3.8E+03</u>	<u>2.2E+03</u>	<u>1.1E+03</u>	<u>6.6E+02</u>	<u>3.9E+02</u>
Inter Phase 2nd Yr	<u>1.1E+04</u>	<u>4.4E+03</u>	<u>2.6E+03</u>	<u>1.8E+03</u>	<u>1.0E+03</u>	<u>4.9E+02</u>	<u>3.1E+02</u>	<u>1.8E+02</u>

Notes:

- Doses exceeding PAGs are underlined.
- Early-Phase PAGs: TEDE - 1 rem, Thyroid (iodine) CDE - 5 rem
- Intermediate-Phase EPA PAGs: 1st year - 2 rem, 2nd year - 0.5 rem
- *** indicates values less than 1 mrem
- To view all values - use Detailed Results | Numeric Table
- Total EDE = Inhalation CEDE + Cloudshine + 4-Day Groundshine

Maximum Dose Values (rem) - To 50 mi

Dist from release miles (kilometers)	15 (24.1)	20 (32.2)	30 (48.3)	40 (64.4)	50 (80.5)
Total EDE	<u>8.6E+01</u>	<u>6.3E+01</u>	<u>3.7E+01</u>	<u>1.8E+01</u>	<u>8.1E+00</u>
Thyroid CDE	<u>3.3E+02</u>	<u>2.7E+02</u>	<u>1.3E+02</u>	<u>5.9E+01</u>	<u>2.3E+01</u>
Inhalation CEDE	<u>3.9E+01</u>	<u>3.1E+01</u>	<u>1.3E+01</u>	<u>4.4E+00</u>	<u>1.3E+00</u>
Cloudshine	<u>4.5E-01</u>	<u>3.8E-01</u>	<u>1.7E-01</u>	<u>7.4E-02</u>	<u>2.7E-02</u>
4-day Groundshine	<u>4.7E+01</u>	<u>3.2E+01</u>	<u>2.4E+01</u>	<u>1.3E+01</u>	<u>6.7E+00</u>
Inter Phase 1st Yr	<u>7.2E+02</u>	<u>4.8E+02</u>	<u>3.8E+02</u>	<u>2.2E+02</u>	<u>1.3E+02</u>
Inter Phase 2nd Yr	<u>3.4E+02</u>	<u>2.3E+02</u>	<u>1.8E+02</u>	<u>1.1E+02</u>	<u>6.9E+01</u>

Notes:

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- Intermediate-Phase PAGs: 1st year - 2 rem, 2nd year - 0.5 rem
- *** indicates values less than 1 mrem
- To view all values - use Detailed Results | Numeric Table
- Total EDE = CEDE Inhalation + Cloudshine + 4-Day Groundshine
- Total Acute Bone = Bone Inhalation + Cloudshine + Period Groundshine

16 March 2010 12:24pm (EDT), NRC Operations Center, Protective Measures Team

This data is based on system condition estimates for a hypothetical, four reactor site. Model results are projections only and may not be representative of an actual release. This projection uses modeled forecast meteorological conditions and is subject to change.

Maximum Dose Values (rem) - Close-In

Dist from release miles (kilometers)	0.5 (0.8)	1. (1.61)	1.5 (2.41)	2. (3.22)	3. (4.83)	5. (8.05)	7. (11.27)	10. (16.09)
Total EDE	<u>5.4E+03</u>	<u>1.5E+03</u>	<u>6.7E+02</u>	<u>3.9E+02</u>	<u>1.8E+02</u>	<u>7.5E+01</u>	<u>4.0E+01</u>	<u>1.4E+01</u>
Thyroid CDE	<u>2.9E+04</u>	<u>7.9E+03</u>	<u>3.6E+03</u>	<u>2.1E+03</u>	<u>9.6E+02</u>	<u>4.0E+02</u>	<u>2.1E+02</u>	<u>7.5E+01</u>
Inhalation CEDE	<u>3.8E+03</u>	<u>1.0E+03</u>	<u>4.8E+02</u>	<u>2.8E+02</u>	<u>1.3E+02</u>	<u>5.4E+01</u>	<u>2.9E+01</u>	<u>1.0E+01</u>
Cloudshine	<u>2.2E+01</u>	<u>8.0E+00</u>	<u>3.9E+00</u>	<u>2.3E+00</u>	<u>8.0E-01</u>	<u>2.6E-01</u>	<u>2.1E-01</u>	<u>1.1E-01</u>
4-day Groundshine	<u>1.5E+03</u>	<u>4.1E+02</u>	<u>1.9E+02</u>	<u>1.1E+02</u>	<u>5.0E+01</u>	<u>2.1E+01</u>	<u>1.1E+01</u>	<u>7.3E+00</u>
Inter Phase 1st Yr	<u>2.6E+04</u>	<u>7.0E+03</u>	<u>3.2E+03</u>	<u>1.9E+03</u>	<u>8.5E+02</u>	<u>3.6E+02</u>	<u>1.9E+02</u>	<u>7.8E+01</u>
Inter Phase 2nd Yr	<u>1.3E+04</u>	<u>3.5E+03</u>	<u>1.6E+03</u>	<u>9.2E+02</u>	<u>4.2E+02</u>	<u>1.8E+02</u>	<u>9.5E+01</u>	<u>4.8E+01</u>

Notes:

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- Intermediate-Phase EPA PAGs: 1st year - 2 rem, 2nd year - 0.5 rem
- *** indicates values less than 1 mrem
- To view all values - use Detailed Results | Numeric Table
- Total EDE = Inhalation CEDE + Cloudshine + 4-Day Groundshine

Maximum Dose Values (rem) - To 50 mi

Dist from release miles (kilometers)	15 (24.1)	20 (32.2)	30 (48.3)	40 (64.4)	50 (80.5)
Total EDE	<u>1.5E+01</u>	<u>4.3E+01</u>	<u>1.1E+01</u>	<u>1.0E+01</u>	<u>9.9E+00</u>
Thyroid CDE	<u>8.6E+01</u>	<u>7.9E+01</u>	<u>5.2E+01</u>	<u>4.9E+01</u>	<u>4.8E+01</u>
Inhalation CEDE	<u>1.1E+01</u>	<u>9.2E+00</u>	<u>7.7E+00</u>	<u>7.6E+00</u>	<u>7.3E+00</u>
Cloudshine	<u>1.2E-01</u>	<u>9.7E-02</u>	<u>7.3E-02</u>	<u>7.0E-02</u>	<u>6.6E-02</u>
4-day Groundshine	<u>4.1E+00</u>	<u>8.4E+00</u>	<u>2.8E+00</u>	<u>2.6E+00</u>	<u>2.5E+00</u>
Inter Phase 1st Yr	<u>7.1E+01</u>	<u>6.0E+01</u>	<u>4.7E+01</u>	<u>4.5E+01</u>	<u>4.3E+01</u>
Inter Phase 2nd Yr	<u>3.6E+01</u>	<u>3.0E+01</u>	<u>2.3E+01</u>	<u>2.2E+01</u>	<u>2.1E+01</u>

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- To view all values - use Detailed Results | Numeric Table
- Total EDE = CEDE Inhalation + Cloudshine + 4-Day Groundshine
- Total Bone = Bone Inhalation + Cloudshine + Period Groundshine

TEDE - Total Effective Dose Equivalent

CDE - Committed Dose Equivalent

CEDE - Committed Effective Dose Equivalent

PAGs - Protective Action Guidelines

EPA - Environmental Protection Agency



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U.S. NUCLEAR REGULATORY COMMISSION

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No. 11-049

March 15, 2011

NRC ANALYSIS CONTINUES TO SUPPORT JAPAN'S PROTECTIVE ACTIONS

NRC analysts overnight continued their review of radiation data related to the damaged Japanese nuclear reactors. The analysts continue to conclude the steps recommended by Japanese authorities parallel those the United States would suggest in a similar situation.

The Japanese authorities Monday recommended evacuation to 20 kilometers around the affected reactors and said that persons out to 30 kilometers should shelter in place.

Those recommendations parallel the protective actions the United States would suggest should dose limits reach 1 rem to the entire body and 5 rem for the thyroid, an organ particularly susceptible to radiation uptake. The currently reported Japanese radiation measurements are well below these guidelines.

A rem is a measure of radiation dose. The average American is exposed to approximately 620 millirems, or 0.62 rem, of radiation each year from natural and manmade sources.

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Blog: <http://public-blog.nrc-gateway.gov>

No. 11-048R

March 14, 2011

REVISED: NRC SENDS ADDITIONAL EXPERTS TO ASSIST JAPAN

The NRC has sent nine additional experts to Tokyo to provide assistance as requested by the Japanese government. Acting as part of a U.S. Agency for International Development assistance team, the NRC has dispatched the experts to Tokyo to provide assistance as requested by the Japanese government.

The first members of the team left the United States Monday evening and were due to arrive in Tokyo Wednesday afternoon. The team includes additional reactor experts, international affairs professional staffers, and a senior manager from one of the NRC's four operating regions.

The team members come from the NRC's headquarters in Rockville, Md., and from offices in King of Prussia, Pa., Chattanooga, Tenn., and Atlanta. The team has been instructed to: conduct all activities needed to understand the status of efforts to safely shut down the Japanese reactors; better understand the potential impact on people and the environment of any radioactivity releases; if asked, provide technical advice and support through the U.S. ambassador for the Japanese government's decision making process; and draw on NRC-headquarters expertise for any other additional technical requirements. The team will be in communication with the Japanese regulator, the U.S. Embassy, NRC headquarters, and other government stakeholders as appropriate.

The team is led by Charles A. Casto, deputy regional administrator of the NRC's Center of Construction Inspection, based in NRC's office in Atlanta. Casto has worked in the commercial nuclear power industry at three different nuclear power plants, including Browns Ferry, which has three boiling water reactors, operated by the Tennessee Valley Authority in Alabama. He has also worked as a licensed reactor operator and operator instructor. Casto will provide a single point of contact for the U.S. Ambassador in Japan on nuclear reactor issues.

The two reactor experts sent Saturday to Japan will participate as members of this assistance team.

Note To Editors: Revision reflects an additional team member, there are now a total of 11 NRC staffers on the assistance team.

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NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

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No. 11-047

March 14, 2011

JAPANESE GOVERNMENT ASKS FOR ASSISTANCE WITH REACTOR EVENTS; U.S. GOVERNMENT AND NRC PREPARING RESPONSE

The Japanese government has formally asked for assistance from the United States as it continues to respond to nuclear power plant cooling issues triggered by an earthquake and tsunami on March 11. As part of a larger U.S. government response, the NRC is considering possible replies to the request, which includes providing technical advice.

Included in a U.S. Agency for International Development (USAID) team dispatched earlier to Japan to assist with the disaster are two boiling-water reactor (BWR) experts from the NRC. They are currently in Tokyo offering technical assistance. USAID is the federal government agency primarily responsible for providing help to countries recovering from a disaster.

The NRC has been monitoring the Japanese reactor events via its Headquarters Operations Center in Rockville, Md., on a 24-hour-a-day basis.

The NRC will not comment on hour-to-hour developments at the Japanese reactors. This is an ongoing crisis for the Japanese who have primary responsibility.

###

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No. 11-046

March 12, 2011

NRC SEES NO RADIATION AT HARMFUL LEVELS REACHING U.S. FROM DAMAGED JAPANESE NUCLEAR POWER PLANTS

The Nuclear Regulatory Commission is coordinating with the Department of Energy and other federal agencies in providing whatever assistance the Japanese government requests as they respond to conditions at several nuclear power plant sites following the March 11 earthquake and tsunami. The NRC has sent two boiling-water reactor experts to Japan as part of a U.S. Agency for International Development team.

In response to nuclear emergencies, the NRC works with other U.S. agencies to monitor radioactive releases and predict their path. All the available information indicates weather conditions have taken the small releases from the Fukushima reactors out to sea away from the population. Given the thousands of miles between the two countries, Hawaii, Alaska, the U.S. Territories and the U.S. West Coast are not expected to experience any harmful levels of radioactivity.

During a nuclear event, the NRC has requirements to protect populations around reactors. For instance, the U.S. evacuation standard at 10 miles is roughly equivalent to the 20-kilometer distance recommended in some instances in Japan. The United States also uses sheltering in place and potassium iodide protective measures also available in Japan.

The NRC will not comment on hour-to-hour developments at the Japanese reactors. This is an ongoing crisis for the Japanese who have primary responsibility.

###

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No. 11-045

March 13, 2011

NRC EXPERTS DEPLOY TO JAPAN AS PART OF U.S. GOVERNMENT RESPONSE

Two officials from the U.S. Nuclear Regulatory Commission with expertise in boiling water nuclear reactors have deployed to Japan as part of a U.S. International Agency for International Development (USAID) team. USAID is the federal government agency primarily responsible for providing assistance to countries recovering from disaster administering.

"We have some of the most expert people in this field in the world working for the NRC and we stand ready to assist in any way possible," said Chairman Gregory Jaczko.

The NRC has stood up its Maryland-based headquarters Operations Center since the beginning of the emergency in Japan, and is operating on a 24-hour basis.

The NRC will not provide information on the status of that country's nuclear power plants. Check the NRC web site or blog for the latest information on NRC actions. Other sources of information include:

USAID -- www.usaid.gov

U.S. Dept. of State -- www.state.gov

FEMA -- www.fema.gov

White House -- www.whitehouse.gov

Nuclear Energy Institute -- www.nei.org

International Atomic Energy Agency -- www.iaea.org/press/

For background information on generic operations at a boiling-water reactor, including an animated graphic, visit the NRC's website at www.nrc.gov.

###

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No. 11-044

March 12, 2011

NRC IN COMMUNICATION WITH JAPANESE REGULATORS

Officials at Nuclear Regulatory Commission headquarters in Rockville, Md., have spoken with the agency's counterpart in Japan, offering the assistance of U.S. technical experts. Should the Japanese want to make use of this expertise, NRC staffers with extensive background in boiling-water reactors are available to assist ongoing efforts.

The NRC is coordinating its actions with other Federal agencies as part of the U.S. government response. The NRC is examining all available information as part of the effort to analyze the event and understand its implications both for Japan and the United States. The NRC's headquarters Operations Center is operating on a 24-hour basis.

U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes and tsunamis. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster. The NRC requires that safety-significant structures, systems, and components be designed to take into account the most severe natural phenomena historically estimated for the site and surrounding area.

For background information on generic operations at a boiling-water reactor, including an animated graphic, visit the NRC's website at www.nrc.gov.

###

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No. 11-043

March 11, 2011

NRC CONTINUES TO TRACK EARTHQUAKE AND TSUNAMI ISSUES

Senior officials at U.S. Nuclear Regulatory Commission headquarters in Rockville, Md., are following events related to the Japanese earthquake and subsequent tsunami. In addition, the agency's regional office in Arlington, Texas, will continue to monitor the Diablo Canyon Power Plant's handling of a notice of unusual event (NOUE) at the site, near San Luis Obispo, Calif., for the duration of the event.

"We offer our condolences to all those in Japan affected by these tragedies," said NRC Chairman Gregory Jaczko. "The NRC is ready to provide whatever assistance we can to our Japanese counterparts, should there be a specific request. We're closely coordinating with other federal agencies."

Friday's tsunami warning, issued after an estimated 8.9 magnitude earthquake occurred off the eastern Japanese coast, prompted Pacific Gas and Electric Co. (PG&E), operator of the Diablo Canyon two-reactor plant, to declare a precautionary NOUE at 4:23 a.m. EST Friday. PG&E has reported both reactors have remained online throughout the event. While PG&E has reported only minor tsunami-related effects, the plant is well-protected against tsunami conditions as required by NRC regulations. NRC staff at the plant are keeping track of the plant's response during the event and remain in close contact with plant operators.

Nuclear power plants are built to withstand environmental hazards, including earthquakes and tsunamis. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster. The NRC requires that safety-significant structures, systems, and components be designed to take into account the most severe natural phenomena historically reported for the site and surrounding area.

In addition to the Diablo Canyon plant, the NRC is following events at the San Onofre nuclear power plant, the Humboldt Bay spent fuel storage site and NRC-regulated nuclear materials sites in Hawaii and Alaska to name a few. Personnel at all those sites have informed the NRC conditions remain safe.

###

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No. 11-042

March 11, 2011

NRC MONITORS NOTICE OF UNUSUAL EVENT AT DIABLO CANYON POWER PLANT, TSUNAMI ISSUES

The U.S. Nuclear Regulatory Commission, through its regional office in Arlington, Tex., is monitoring a notice of unusual event (NOUE) at the Diablo Canyon Power Plant, located near San Luis Obispo, Calif. Senior NRC officials are working at the agency's Rockville, Md., headquarters to coordinate NRC activities with respect to the Japanese earthquake and subsequent tsunami.

"The NRC is closely monitoring this situation as it unfolds with respect to nuclear facilities within the United States. NRC staff is working closely with its resident inspectors who are on site to ensure safe operations," said NRC Chairman Gregory Jaczko.

Pacific Gas and Electric Co. (PG&E), operator of the Diablo Canyon two-reactor plant, declared a precautionary NOUE Unusual Event at 4:23 a.m. EST today after receiving a tsunami warning from the West California Emergency Management Agency. The tsunami warning was generated after an estimated 8.9 magnitude earthquake occurred off the eastern Japanese coast.

The licensee reported the Diablo Canyon plant is stable and both units remain on line. The plant is well protected against tsunami conditions as required by NRC regulations. The NRC has staff at the plant keeping track of the plant's response.

Nuclear power plants are built to withstand environmental hazards, including earthquakes and tsunamis. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster. The NRC requires that safety-significant structures, systems, and components be designed to take into account the most severe natural phenomena historically reported for the site and surrounding area.

In addition to the Diablo Canyon plant, the NRC is also monitoring the San Onofre nuclear power plant, the Humboldt Bay spent fuel storage site and NRC-regulated nuclear materials sites in Hawaii and Alaska to name a few. Site personnel have informed the NRC they are prepared for possible tsunami effects.

###

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Press Releases

Press Release (Mar 18, 2011)
Status of TEPCO's Facilities and its services after Tohoku-Taiheiyou-OkI Earthquake (as of 10:00AM)

Due to the Tohoku-Taiheiyou-OkI Earthquake which occurred on March 11th 2011, TEPCO's facilities including our nuclear power stations have been severely damaged. We deeply apologize for the anxiety and inconvenience caused.

Below is the status of TEPCO's major facilities.
*new items are underlined

[Nuclear Power Station]
Fukushima Daiichi Nuclear Power Station:
Units 1 to 3: shutdown due to earthquake
(Units 4 to 6: outage due to regular inspection)

- * The national government has instructed to evacuate for those local residents within 20km radius of the site periphery and to remain indoors for those local residents between 20km and 30km radius of the site periphery.

- * Unit 1
The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th. We have started injection of sea water at 8:20 pm and then boric acid into the reactor afterwards.

- * Unit 2
At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in article 15, clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation. At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location. Sea water injection to the reactor is still under operation.

- * Unit 3
At 6:50 am, March 14th, while water injection to the reactor was under operation, the pressure of the reactor containment vessel increased to 530 kPa. As a result, at 7:40 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure has gradually decreased (as of 9:05 am, 490 kPa).

At approximately 11:00 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them are conscious) have sustained injuries and they were already dispatched to the hospital by ambulances.

As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered, however the works on March 16th was cancelled.

At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable in a certain range. Monitoring will be continued.

In order to cool spent fuel pool, water discharge by helicopters has been conducted on March 17th with the cooperation of Self-Defense Force.

At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police had started water discharge by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they had finished water discharge.

- * Unit 4
At approximately 6:00 am, March 15th, an explosive sound occurred and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employee confirmed that the fire was off.

At approximately 5:45 am, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am,

TEPCO staff confirmed at the site that there are no signs of fire.

* On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool is secured. A detailed inspection is under preparation.

* common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

* On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection is under preparation.

* dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

* We will continuously endeavor to securing safety, and monitoring of the surrounding environment.

Fukushima Daiichi Nuclear Power Station:

Units 1 to 4: shutdown due to earthquake

* The national government has instructed evacuation for those local residents within 10km radius of the periphery.

* In order to achieve cold shutdown, reactor cooling function was restored and cooling of reactors was conducted. As a result, all reactors achieved cold shutdown: Unit 1 at 5:00 pm, March 14th, Unit 2 at 6:00 pm, March 14th, Unit 3 at 8:15 pm, March 12th, Unit 4 at 7:15 am, March 16th.

* Since March 12th, we had been preparing measures for reducing the pressure of reactor containment vessels (partial discharge of air containing radioactive materials to outside), but on March 17th, we released such preparation in all Units.

* (Unit 1)

As it is confirmed that the temperature of the Emergency Equipment Cooling Water System #1 has increased, at 3:20 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 4:25 pm, March 15th, after replacing the power facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

* (Unit 4)

As it is confirmed that the pressure at the outlet of the pumps of the Emergency Equipment Cooling Water System #1 has been decreased, at 8:05 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 9:25 pm, March 15th, after replacing the power facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

*1: emergency water system in which cooling water (pure water) circulates which exchanged the heat with sea water in order to cool down bearing pumps and/or heat exchangers etc.

Kashiwazaki Kariwa Nuclear Power Station:

Units 1, 5, 6, 7: normal operation

(Units 2 to 4: outage due to regular inspection)

[Thermal Power Station]

Hirono Thermal Power Station Units 1 and 2: shutdown due to earthquake

Nitachinaka Thermal Power Station Unit 1: shutdown due to earthquake

Kashima Thermal Power Station Units 2, 3, 5, 6: shutdown due to earthquake

Higashi-Ogishima Thermal Power Station Unit 1: shutdown due to earthquake

[Hydro Power Station]

* All the stations have been restored.

[Transmission System]

All substation failed due to the earthquake have been restored.

[Blackout in TEPCO's Service Area]

Total of approximately 1,600 households are out of power (as of 9:00PM,

March 17, 2011)

Tokyo: 0

Kanagawa Pref.: 0

Tochigi Pref.: 0

Chiba Pref.: 0

Saitama Pref.: 0

Gunma Pref.: 0

Ibaraki Pref.: 2,562

Yamanashi Pref.: 0

Shizuoka Pref.: 0 (east of Fuji River)

[Supply and Demand Status within TEPCO's Service Area to Secure Stable Power Supply]

Backup supply from Shinshinano Conversion Station: 600MW

Backup supply from Sakuma Conversion Station: 300MW

Backup supply from Higashi Shimizu Conversion Station: 100MW

Backup supply from Kitahon Interconnection Facility: 600MW

Considering the critical balance of our power supply capacity and expected power demand forward, in order to avoid unexpected blackout, TEPCO has implemented rolling blackout (planned blackout alternates from one area to another) since yesterday. We will make our utmost to secure the stable power supply as early as possible.

For customers who will be subject to rolling blackout, please be prepared for the announced blackout periods. Also for customers who are not subject to blackouts, TEPCO appreciates your continuous cooperation in reducing electricity usage by avoiding using unnecessary lighting and electrical equipment.

[Others]

Please do NOT touch cut-off electric wires.

In order to prevent fire, please make sure to switch off the electric appliances such as hair drier and to shut down the breaker of distribution board when you leave your house.

For the customer who has in-house power generation, please secure fuel for generator.

[Back to page top](#)

NOT FOR PUBLIC DISCLOSURE

Press Releases

Press Release (Mar 18, 2011)
Plant Status of Fukushima Daiichi Nuclear Power Station (as of 2:00 PM Mar 18th)

*new items are underlined>

All 6 units of Fukushima Daiichi Nuclear Power Station have been shut down.

Unit 1 (Shut down)

- Reactor has been shut down. However, the explosive sound and white smoke were confirmed after the big quake occurred at 3:36PM Mar 11th. It was assumed to be hydrogen explosion.
- We have been injecting sea water into the reactor pressure vessel.

Unit 2 (Shut down)

- Reactor has been shut down and the level of reactor coolant had dropped and the reactor pressure had increased because the Reactor Core Isolation Cooling System stopped. Measures were taken to lower the pressure within the Reactor Containment Vessel and to inject sea water into the Reactor while carefully confirming safety. The level of reactor coolant and the pressure of the Reactor resumed.
- At approximately 6:00AM on March 15, 2011, an abnormal noise began emanating from nearby Pressure Suppression Chamber and the pressure within this chamber decreased.
- We have been injecting sea water into the reactor pressure vessel.

Unit 3 (Shut down)

- Reactor has been shut down. However, the explosive sound and white smoke were confirmed at 11:01AM Mar 11th. It was assumed to be hydrogen explosion.
- At 8:30AM on March 16th, fog-like steam was confirmed arising from the reactor building.
- At approximately 2:15AM on March 17th the pressure of the Suppression Chamber has temporarily increased.
- We have been injecting sea water into the reactor pressure vessel.

Unit 4 (outage due to regular inspection)

- Reactor has been shut down. However, at approximately 6AM on March 15th. We have confirmed the explosive sound and the sustained damage around the 5th floor rooftop area of the Nuclear Reactor Building.
- On March 15th and 16th, we respectively confirmed the outbreak of fire at the 4th floor of the northwestern part of the Nuclear Reactor Building. We immediately reported this matter to the fire department and the related authorities. TEPCO employees confirmed that each fire had already died down by itself.
- At this moment, we do not consider any reactor coolant leakage inside the reactor containment vessel happened.

Unit 5 (outage due to regular inspection)

- Reactor has been shut down and the sufficient level of reactor coolant to ensure safety is maintained.
- At this moment, we do not consider any reactor coolant leakage inside the reactor containment vessel happened.

Unit 6 (outage due to regular inspection)

- Reactor has been shut down and the sufficient level of reactor coolant to ensure safety is maintained.

Press Releases

Press Release (Mar 17, 2011)
March 17th (Thu): Group 4 (Original Schedule: 18:20 - 22:00)

-Blackout Period: Approximately 3 hours (18:20PM - 22:00PM)
-Expected Number of Customers: Approximately 2,310,000 customers
-Applicable Region: Saitama pref., Kanagawa pref., Tokyo, Yamanashi pref.,
Gunma pref., Tochigi pref

No. A
Kawaguchi city, Soka city, Yashio city, Warabi city

No. B
Saitama city (Urawa ward, Minuma ward, Sakura ward, Nishi ward, Omiya ward,
Chuo ward, Minami ward, Kita ward, Midori ward), Toda city, Kawaguchi city,
Warabi city

No. C
Isehara city, Atsugi city, Zama city, Sagamihara city (Chuo ward,
Minami ward, Midori ward), Machida city, Aikawa town

No. D
Okegawa city, Kaze city, Kuki city, Saito city, Ageo city, Miyashiro town,
Shiraoka town, Ina town, Nasuda city

No. E
Inagi city, Munitachi city, Akishima city, Hino city, Nishi city,
Tachikawa city

No. F
Yokohama city (Tsurumi ward), Kawasaki city (Saiwai ward, Kawasaki ward,
Nakahara ward)

No. G
Saitama city (Minuma ward, Nishi ward, Omiya ward, Chuo ward, Kita ward),
Fujimino city, Okegawa city, Sayama city, Kumagaya city, Kounosu city,
Sakado city, Ageo city, Miya city, Fukuoka city, Kawagoe city, Yorii town,
Yokozaki town, Minano town, Nagatsuma town, Nagashino-chichibu village,
Chichibu city, Asaka city, Tsurugashima city, Higashimatsuyama city,
Hidaka city, Ogose town, Moroyama town, Irumoto city, Hanno city,
Tokigawa town, Namegawa town, Yashiki town, Ogawa town, Kawajima town,
Hatoyama town, Ranzan town, Fumi city, Wako city

No. H
Koshu city, Kai city, Kofu city, Yamanashi city, Ichikawanisato town,
Chuo city, Shova town, Maetsuki city, Minamirupusu city

No. I
Izumi city, Otsu city, Chiyoda town, Dizumi town, Oura town, Kumagaya city

No. J
Midori city, Izumi city, Kiryu city, Ota city, Honjo city, Ashikaga city

No. K
Saitama city (Urawa ward, Minami ward, Midori ward), Toda city, Warabi city,
Kawaguchi city

No. L
Saitama city (Urawa ward, Omiya ward, Minami ward, Midori ward), Toda city,
Kawaguchi city, Matogaya city, Warabi city, Adachi ward

No. M
Yugawara city, Hadano city, Yugawara city, Nakone town, Kaisei town,
Yamakita town, Matsuda town, Oi town, Nakai town, Minamiasahigara city

No. N
Iwafune town, Tatebayashi city, Sano city, Ashikaga city, Tochigi city,
Chiyoda town, Itakura town, Meiva town, Oura town

*No. is based on each substation's coverage area.

*We will make maximum efforts to continue supplying electricity to the
railroad services and may not carry out the rolling blackout.
*Newly applicable areas due to operations from substations. However, those
areas could be out of the target if the network systems change in future.

[Back to page top](#)

Press Releases

Press Release (Mar 17, 2011)

March 17th (Thu): Group 1 (Original Schedule: 16:50 - 20:30)

- Blackout Period: Approximately 3 hours (16:50PM - 20:30PM)
- Customers (planned): Approximately 2,890,000 customers
- Areas : Chiba pref., Tochigi pref., Saitama pref., Gunma pref., Kanagawa pref.

No.A

Kyonan Town, Kamogawa City, Tateyama City, Kimitsu City, Ishihara City, Sodegaura City, Chonan Town, Nagara Town, Minamiboso City, Futatsu City, Mobara City, Kisarazu City

No.B

Sakura City, Otawara City, Nasukarasuyama City, Nasushiobara City, Nakagawa Town, Nasu Town, Yaita City

No.C

Saitama City (Nishi ward), Fujimino City, Sayama City, Sakado City, Shiki City, Tokorozawa City, Niiza City, Kawagoe City, Asaka City, Miyoshi Town, Iruma City, Fujimi City, Maiki City

No.D

Yotsukaido City*, Isumi City, Sakura City, Oamishirasato Town, Ichihara City, Chiba City (Inage Ward, Hanamigawa Ward, Wakaba Ward, Chuo Ward, Mihama Ward, Midori Ward), Funabashi City, Ichinomiya Town, Chosei Village, Chonan Town, Nagara Town, Shirako Town, Mutsuzawa town, Togane city, Yachimata city, Yachiyo city, Mobara city

No.E

Minano Town, Ogano Town, Maichibu City, Yorii Town, Nagatoro Town, Higashichichibu Village, Yokoze Town, Hanno City, Ogawa Town, Tokigawa Town, Ranzan Town

No.F

Yokosuka City, Yokohama City (Isogo Ward, Sakae Ward, Kanazawa Ward, Konan Ward), Kamakura City, Chigasaki City, Hayama Town, Zushi City, Fujisawa City

No.G

Kanagawa City, Funabashi City, Shiroy City

No.H

Kawasaki City (Saiwai Ward*, Kawasaki Ward*)

No.I

Midori City, Isesaki City, Kiryu City, Tamamura Town, Maebashi City

No.J

Aikawa Town, Kiyokawa Village, Ayase City, Isehara City, Ebina City, Chigasaki City, Atsugi City, Samukawa Town, Zama City, Sagami-hara City (Chuo Ward, Minami Ward), Yamato City, Fujisawa City, Hiratsuka City

No.K

Shibukawa City, Maebashi City, Showa Village

Press Releases

Press Release (Mar 17, 2011)

Thursday, March 17: Group 3 (Original Schedule 15:20 - 19:00)

- Blackout Period: Approximately 3 hours (15:20 - 19:00)
- Customers (planned): Approximately 2.9 million
- Areas: Saitama pref, Tokyo Metropolitan, Chiba pref, Kanagawa pref, Tochigi pref, Yamanashi pref, Gunma pref and Shizuoka pref (limited area).

No.A

Fujimino City, Shiki City, Niiza City, Asaka City, Miyoshi Town, Itabashi Ward, Fujimi City, Wako City, Nerima Ward

No.B

Inzai City, Shisui Town, Abiko City, Sakura City (Chiba Pref.), Shibayama Town, Oamishirosato Town, Narita City, Shiroa City, Yachimata City, Tomisato City

No.C

Miura City*1, Yokosuka City*1, Zushi City*1

No.D

Akiruno City, Hamura City, Akishima City, Okutama Town, Mizuho Town, Hinode Town, Hinohara Village, Omae Town, Hachioji City, Musashimurayama City, Fussa City, Kosuge Village, Tabayama Village, Iruma City, Moroyama Town, Hanoo City, Tokorozawa City

No.E

Utsunomiya City, Shiota Town, Mibu Town, Shimotsuke City, Kaminokawa Town, Kanuma City, Nishikata Town, Tochigi City, Nikko City

No.F

Yokohama City (Isogo Ward, Totsuka Ward, Kounan Ward, Kouhoku Ward, Kanagawa Ward, Naka Ward, Tsurumi Ward, Minami Ward, Hodogaya Ward), Kawasaki City (Saiwai Ward, Kawasaki Ward, Nakahara Ward)

No.G

Saitama City (Urawa Ward, Iwatsuki Ward, Minuma Ward, Nishi Ward, Omiya Ward, Chuo Ward, Kita Ward, Midori Ward), Kasukabe City, Misasagi Town, Sugito Town

No.H

Kai City, Kofu City, Nirasaki City, Hokuto City

No.I

Odawara City, Hadano City, Manazuru City, Yugawara Town, Matsuda Town, Minamiashigara City, Atami City *2

No.J

Kokubunji City, Kunitachi City, Mitaka City, Koganei City, Kodaira City, Akishima City, Nishitokyo City, Chofu City, Higashimurayama City, Higashiyamato City, Fuchu City, Musashimurayama City, Musashino City, Tachikawa City

No.K

Tatebayashi City, Ota City, Chiyoda Town, Oizumi Town, Oura Town,

Mooka City, Ashikaga City

No.L

Saitama City (Urawa Ward, Minuma Ward, Sakura Ward, Nishi Ward, Omiya Ward, Chuo Ward, Minami Ward, Kita Ward, Midori Ward), Hanyu City, Okegawa City, Toda City, Gyoda City, Konosu City, Ageo City, Ina Town, Kitamoto City, Hasuda City, Warabi City

No.M

Yokosuka City, Kamakura City, Hayama Town, Miura City, Zushi City

No.N

Utsunomiya City, Iwafune Town, Mibu Town, Shimotsuke City, Kaminokawa Town, Sano City, Kanuma City, Oyama City, Mooka City, Ashikaga City, Tochigi City, Nikko City, Nishikata Town, Shioya Town

No.O

Isesaki City, Kumagaya City, Gyoda City, Kamisato Town, Kamikawa Town, Misato Town, Fukaya City, Ota City, Yorii Town, Higashimatsuyama City, Namegawa Town, Yoshimi Town, Ogawa Town, Ranzan Town, Honjo City, Oizumi Town

No.P

Yokohama City (Sakae Ward, Totsuka Ward, Konan Ward)

•Locations are divided into each blocks based on each substation's coverage area.

- *1 Newly applicable areas due to operations from substations. However, those areas could be out of the target if the network systems change in future.
- *2 Shizuoka prefecture including Atami City is not subject to the rolling blackout, however, customers in Atami City whose power is supplied through inter-prefecture lines from the prefecture may have the rolling blackout.

We will make maximum efforts to continue supplying electricity to the railroad services and may not carry out the rolling blackout.

[Back to Page Top](#)

Press Releases

Press Release (Mar 17, 2011)

Thursday, March 17: Group 5 (Original Schedule 13:50 - 17:30)

- Blackout Period: Approximately 3 hours (13:50 - 17:30)
- Customers (planned): approximately 3.1 million
- Areas: Chiba pref., Yamanashi pref., Kanagawa pref., Gunma pref., Saitama pref. Tochigi pref. and Tokyo Metropolitan

No.A

Misato City, Soka City, Yashio City

No.B

Koshu City, Yamanashi City, Otsuki City, Tsuru City, Yamanakako Village, Nishikatsura Town, Oshino Village, Fujikawaguchiko Town, Warusawa Village, Fujiyoshida City, Kosuge Village

No.C

Hiratsuka City, Oiso Town, Ninomiya Town, Tsehara City, Chigasaki City, Atsugi City, Hadano City, Ebina City, Sagakawa Town

No.D

Otawara City, Utsunomiya City, Sakura City (Tochigi pref.), Nikko City, Yaita City, Nasushiobara City, Takanawa Town, Shioya Town

No.E

Annaka City, Shimonita Town, Kahra Town, Nanmoku Village, Takasaki City, Tamamura Town, Kamisato Town, Kamikawa Town, Misato Town, Fukaya City, Kanna Town, Chichibu City, Fuzuka City, Tomioka City, Honjo City

No.F

Koshigaya City, Arakawa Ward, Misato City, Kawaguchi City, Soka City, Adachi Ward, Yashio City

No.G

Yokohama City (Aoba Ward, Tsuzuki Ward), Kawasaki City (Miyamae Ward, Takatsu Ward)

No.H

Isesaki City, Kusatsu Town, Nakanojo Town, Naganohara Town, Tamagaki Village, Takasaki City, Tamamura Town, Shibukawa City, Maebashi City

No.I

Aikawa Town, Uenohara City, Sagami-hara City (Chuo Ward, Minami Ward, Midori Ward), Machida City, Doshi Village

No.J

Utsunomiya City, Sakura City (Tochigi pref.), Nasukarasuyama City, Yaita City, Otawara City, Nakagawa Town, Ichikai Town, Motegi Town, Kaminokawa Town, Shioya Town

No.K

Yokohama City (Isogo Ward, Sakae Ward, Totsuka Ward, Konan Ward, Izumi Ward, Minami Ward), Kamakura City, Fujisawa City

No.L

Abiko City, Kamagaya City, Matsudo City, Kashiwa City, Shiroi City,
Noda City, Nagareyama City

No.M

Kumagaya City, Gyoda City, Fukaya City, Honjo City

No.N

Hiratsuka City, Aikawa Town, Kiyokawa Village, Zama City, Isehara City,
Atsugi City, Hadano City, Ebina City

•Locations are divided into each blocks based on each substation's
coverage area.

We will make maximum efforts to continue supplying electricity to the
railroad services and may not carry out the rolling blackout.

☐ BACK TO TOP OF PAGE

NOT FOR PUBLIC DISCLOSURE

Press Releases

Press Release (Mar 17, 2011)
Impact to TEPCO's Facilities due to Tohoku-Taiheiyou-Oki Earthquake (as of 10:00AM)

Due to the Tohoku-Taiheiyou-Oki Earthquake which occurred on March 11th 2011, TEPCO's facilities including our nuclear power stations have been severely damaged. We deeply apologize for the anxiety and inconvenience caused.

Below is the status of TEPCO's major facilities.
*new items are underlined

[Nuclear Power Station]

Fukushima Daiichi Nuclear Power Station:

Units 1 to 3: shutdown due to earthquake
(Units 4 to 6: outage due to regular inspection)

* The national government has instructed to evacuate for those local residents within 20km radius of the site periphery and to remain indoors for those local residents between 20km and 30km radius of the site periphery.

* Unit 1

The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th. We have started injection of sea water at 8:20 pm and then boric acid into the reactor afterwards.

* Unit 2

At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in article 15, clause 1 occurred (failure of reactor cooling function). At 5:17 pm, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation. At approximately 6:44 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.

Sea water injection to the reactor is still under operation.

* Unit 3

At 6:50 am, March 14th, while water injection to the reactor was under operation, the pressure in the reactor containment vessel increased to 630 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure has gradually decreased (as of 9:05 am, 490 kPa).

At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them are conscious) have sustained injuries and they were already dispatched to the hospital by ambulances.

As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered,

however the works on March 16th was cancelled.

At 6:15 am Today, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable in a certain range. Monitoring will be continued.

In order to cool spent fuel pool, water discharge by helicopters has been conducted today on March 17th with the cooperation of Self-Defense Force.

* Unit 4

At approximately 6:00 am, March 15th, an explosive sound occurred and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employee confirmed that the fire was off.

At approximately 5:45 am, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there are no signs of fire.

*We will continuously endeavor to securing safety, and monitoring of the surrounding environment.

Fukushima Daini Nuclear Power Station:

Units 1 to 4: shutdown due to earthquake

* The national government has instructed evacuation for those local residents within 10km radius of the periphery.

* In order to achieve cold shutdown, reactor cooling function was restored and cooling of reactors was conducted. As a result, all reactors achieved cold shutdown: Unit 1 at 5:00 pm, March 14th, Unit 2 at 6:00 pm, March 14th, Unit 3 at 0:15 pm, March 12th, Unit 4 at 7:45 am, March 16th.

* (Unit 1)

As it is confirmed that the temperature of the Emergency Equipment Cooling Water System *1 has increased, at 3:20 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 4:25 pm, March 15th, after replacing the power facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

* (Unit 4)

As it is confirmed that the pressure at the outlet of the pumps of the Emergency Equipment Cooling Water System*1 has been decreased, at 8:05 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 9:25 pm, March 15th, after replacing the relevant facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

*:emergency water system in which cooling water (pure water) circulates which exchanged the heat with sea water in order to cool down bearing pumps and/or heat exchangers etc.

Ishiwatari Kariwa Nuclear Power Station:

Units 1, 5, 6, 7: normal operation

(Units 2 to 4: outage due to regular inspection)

[Thermal Power Station]

Hirono Thermal Power Station Units 2 and 4: shutdown due to earthquake

Hitachinaka Thermal Power Station Unit 1: shutdown due to earthquake

Kashima Thermal Power Station Units 2, 3, 5, 6: shutdown due to earthquake

Ohi Thermal Power Station Unit 2: shutdown due to earthquake

Higashi-Ongishima Thermal Power Station Unit 1: shutdown due to earthquake

[Hydro Power Station]

* All the stations have been restored.

[Transmission System, etc.]

All substation failed due to the earthquake have been restored.

[Blackout in TEPCO's Service Area]

Total of about 2,600 households are out of power (as of 10:00 today).

Tokyo: 0

Kanagawa Pref.: 0

Tochigi Pref.: 0

Chiba Pref.: 0

Saitama Pref.: 0

Gunma Pref.: 0

Ibaraki Pref.: 2,561

Yamanashi Pref.: 0

Shizuoka Pref.: 0 (east of Fuji River)

[Supply and Demand Status within TEPCO's Service Area to Secure Stable Power Supply]

Backup supply from Shinshinano Conversion Station: 600MW

Backup supply from Sakuma Conversion Station: 300MW

Backup supply from Higashi Shimizu Conversion Station: 100MW

Backup supply from Kitahon Interconnection Facility: 600MW

Considering the critical balance of our power supply capacity and expected power demand forward, in order to avoid unexpected blackout, TEPCO has implemented rolling blackout (planned blackout alternates from one area to another) since yesterday. We will make our utmost to secure the stable power supply as early as possible.

For customers who will be subject to rolling blackout, please be prepared for the announced blackout periods. Also for customers who are not subject to blackouts, TEPCO appreciates your continuous cooperation in reducing electricity usage by avoiding using unnecessary lighting and electrical equipment.

[Others]

Please do NOT touch cut-off electric wires.

In order to prevent fire, please make sure to switch off the electric appliances such as hair drier and to shut down the breaker of distribution board when you leave your house.

For the customer who has in-house power generation, please secure fuel for generator.

□ Page 19 of 19

Press Releases

Press Release (Mar 17, 2011)

Plant Status of Fukushima Daiichi Nuclear Power Station (as of 9:00 am Mar 17th)

All 6 units of Fukushima Daiichi Nuclear Power Station have been shut down.

Unit 1 (Shut down)

- Reactor has been shut down. However, the explosive sound and white smoke were confirmed after the big quake occurred at 3:36PM Mar 12th. It was assumed to be hydrogen explosion and currently under the investigation.
- We have been injecting sea water into the reactor pressure vessel.

Unit 2 (Shut down)

- Reactor has been shut down and Reactor Core Isolation Cooling System has been injecting water to the reactor. However, reactor pressure has increased because the system stopped, causing reactor water level to drop. Following the instruction by the government and with fully securing safety, measure to lower the pressure level within the reactor containment vessel and injection of sea water were taken, reactor pressure and water level resumed.
- We are continuing the injection of sea water into the reactor.
- At approximately 6:00am, an abnormal noise began emanating from nearby Pressure Suppression Chamber and the pressure within this chamber decreased.
- While we continue sea water injection operations, the temporary transfer of TEPCO employees and workers from other companies not directly involved in this work has begun.

Unit 3 (Shut down)

- Reactor has been shut down. However, the explosive sound and white smoke were confirmed at 11:01AM Mar 14th. It was assumed to be hydrogen explosion and currently under the investigation.
- As fog like steam was confirmed from reactor building at 8:30AM on March 16th, we transferred the workers to safe area. After that, we decided to discharge water to the upper side of reactor building by helicopters, but could not do that because there was a trouble with implementation of work.
- We plan to discharge water in order to cool spent fuel pool after we complete the preparations by confirming the process of discharging, personnel, and a situation of the site.
- We continue monitoring as it was reported that the pressure of the Suppression Chamber temporarily increased at around 6:15AM on March 17th.
- We have been injecting sea water into the reactor pressure vessel.

Unit 4 (shut down due to regular inspection)

- Reactor has been shut down. However, we have confirmed the sustained damage around the 5th floor rooftop area of the Nuclear Reactor Building.
- Afterwards, we confirmed the outbreak of fire at the northwestern part of Nuclear Reactor Building. We immediately reported this matter to the fire department and the related authorities.
- However, at approximately 11:00am, when TEPCO employee arrived at the scene to confirm, the fire had already died down. At 5:45AM on March 16th, we confirmed the outbreak of the fire again but could not confirm it at 6:15AM. We will continue to monitor the situation carefully.

Unit 5 (outage due to regular inspection)
-Reactor has been shut down and sufficient level of reactor coolant to ensure safety is maintained.
-Currently, we do not believe there is any reactor coolant leakage inside the reactor containment vessel.

Unit 6 (outage due to regular inspection)
-Reactor has been shut down and sufficient level of reactor coolant to ensure safety is maintained.
-Currently, we do not believe there is any reactor coolant leakage inside the reactor containment vessel.

Casualty

-2 workers of cooperative firm were injured at the occurrence of the earthquake, and were transported to the hospital.
-1 TEPCO employee who was not able to stand by his own with his hand holding left chest was transported to the hospital by an ambulance.
-1 subcontract worker at important earthquake-proof building was unconscious and transported to the hospital by an ambulance.
-The radiation exposure of 1 TEPCO employee, who was working inside the reactor building, exceeded 100mSv and was transported to the hospital.
-2 TEPCO employees felt bad during their operation in the central control rooms of Unit 1 and 2 while wearing full masks, and were transferred to Fukushima Daini Power Station for consultation with a medical advisor.
-4 workers were injured and transported to the hospital after explosive sound and white smoke were confirmed around the Unit 1.
-11 workers were injured and transported to Fukushima Daini Nuclear Power Station after explosive sound and white smoke were confirmed around the Unit 3. One of the injured workers got medical treatment on March 16th, but the worker reported a flank pain. We required to the offsite center that the worker should be transported to the hospital. After that, the helicopter of JSDF arrived and transported the worker to the FUKUSHIMA Medical University Hospital at 10:56.
-Presence of 2 TEPCO employees at the site is not confirmed.

Others

-We are currently coordinating with the relevant authorities and departments as to how to secure the cooling water to cool down the water in the spent nuclear fuel pool of the plant.
-We measured radioactive materials inside of the nuclear power station area (outdoor) by monitoring car and confirmed that radioactive materials level is getting higher than ordinary level. As listed below, we have determined that specific incidents stipulated in article 15, clause 1 (Abnormal increase in radiation dose measured at site boundary) have occurred.

Determined at 4:17 pm Mar 12th (Around Monitoring Post 4)
•Determined at 8:56 am Mar 13th (Around Monitoring Post 4)
•Determined at 2:15 pm Mar 13th (Around Monitoring Post 4)
•Determined at 3:55 am Mar 14th (Around Monitoring Post 6)
•Determined at 4:15 am Mar 14th (Around Monitoring Post 2)
•Determined at 9:37 am Mar 14th (Around Monitoring Post 3)
•Determined at 9:31 pm Mar 14th (Around main entrance)
•Determined at 6:51 am Mar 15th (Around main entrance)
•Determined at 8:11 am Mar 15th (Around main entrance)
•Determined at 4:17 pm Mar 15th (Around main entrance)
•Determined at 11:05 pm Mar 15th (Around main entrance)

-We will continue to make announcements when it was determined that a specific incident stipulated in article 15, clause 1 has occurred.
-The national government has instructed evacuation for those local residents within 20km radius of the periphery and evacuation to inside for those residents from 20km to 30km radius of the periphery, because it's possible that radioactive materials are discharged.
-Today, at approximately 10am, we observed 400mSv/h at the inland side of the Unit 3 reactor building and 100mSv/h at the inland side of the Unit 4 reactor building.
-We will continue to take all measures to restore the security of the site and to monitor the environment of the site periphery.

▶ Back to page top

Press Releases

Press Release (Mar 17, 2011)

March 17th (Thu): Group 2 (Original Schedule: 12:20 - 16:00)

- Blackout Period: Approximately 3 hours (12:20PM - 16:00PM)
- Expected Number of Customers: Approximately 3,220,000 customers
- Applicable Region: Saitama pref., Chiba pref., Kanagawa pref., Tokyo, Tochigi pref., Yamanashi pref.

[Areas] No. is based on each substation's coverage area.

No.A

Sayama City, Sakado City, Tokorozawa City, Kawagoe City, Maunashima City, Hidaka City, Ogose Town, Moroyama Town, Iruma City, Hanno City, Tokigawa Town, Kawashima Town

No.B

Sakura City, Narashino City, Yachiyo City

No.C

Sagamihara City (*Chuo Ward, *Minami Ward, *Midori Ward), Kawasaki City (Asao Ward), *Machida City

No.D

Hanyu City, Okegawa City, Kazo City, Maika City, Kumagaya City, Satte City, Gyoda City, Kounosu City, Ageo City, Shiraoka Town, Kitamoto City

No.E

Inagi City, Komae City, Mitaka City, Koganei City, Tama City, Chofu City, Fuchu City, Musashino City

No.F

Iwafune Town, Nogi Town, Kanuma City, Oyama City, Tochigi City

No.G

Saitama City (Urawa Ward, Sakura Ward, Omiya Ward, Chuo Ward, Minami Ward, Midori Ward), Kosuigaya City, Yoshikawa City, Toda City, Misato City, Kasukabe City, Kawaguchi City, Soka City, Matsubushi Town, Warabi City

No.H

Ichikawa City, Matsudo City, Funabashi City

No.I

Chirasaki City, Samukawa Town, Oiso Town, Hiratsuka City

No.J

Kamagaya City, Ichikawa City, Narashino City, Chiba City (Hanamigawa Ward, Wakaba Ward, Mihama Ward, Midori Ward), Funabashi City, Yachiyo City

No.K

Hino City, Hachioji City

No.L

Akishima City, Hino City, Hachioji City

No.M

Saitama City (Urawa Ward, Iwatsuki Ward, Sakura Ward, Minami Ward,

Press Releases

Press Release (Mar 17, 2011)

Plant Status of Fukushima Daini Nuclear Power Station (as of 9:00 am March 17th)

[No Latest Developments since 9:00pm, 16th March]

Unit Status

- 1
 - Reactor cold shutdown, stable water level, offsite power is available.
 - No refrigerant is leaked in the reactor contaminant vessel.
 - Maintain average water temperature at 100°C in the pressure restraint.
- 2
 - Reactor cold shutdown, stable water level, offsite power is available.
 - No refrigerant is leaked in the reactor contaminant vessel.
 - Maintain average water temperature at 100°C in the pressure restraint.
- 3
 - Reactor cold shutdown, stable water level, offsite power is available.
 - No refrigerant is leaked in the reactor contaminant vessel.
 - Maintain average water temperature at 100°C in the pressure restraint.
- 4
 - Reactor cold shutdown, stable water level, offsite power is available.
 - No refrigerant is leaked in the reactor contaminant vessel.
 - Maintain average water temperature at 100°C in the pressure restraint.

other none

[The next information in regard to the plant is planned to be released at 0:00 pm, 17th March.]

[Back to page top](#)

Press Releases

Press Release (Mar 17, 2011)
March 17th (Thu): Group 1 (Original Schedule: 9:20 - 13:00)

-Blackout Period: Approximately 3 hours (9:20AM - 13:00PM)
-Expected Number of Households: Approximately 2,890,000 customers
-Applicable Region: Chiba pref., Tochigi pref., Saitama pref.,
Gunma pref., Kanagawa pref.

[Areas] No. is based on each substation's coverage area.

No.A
Kyonan Town, Kamogawa City, Tateyama City, Kimitau City, Ichihara City,
Sodegaura City, Chonan Town, Nagara Town, Minamiboso City, Futtsu City,
Mobara City, Kisarazu City

No.B
Sakura City, Otawara City, Nasukarasuyama City, Nasushiobara City,
Nakasawa Town, Nasu Town, Yaita City

No.C
Saitama City (Nishi ward), Fujimino City, Sayama City, Sakado City,
Shiki City, Tokorozawa City, Miya City, Kawago City, Asaka City,
Miyoshi Town, Iruma City, Fujimi City, Wako City

No.D
Yotsukaido City*, Isumi City, Sakura City, Oamishirasato Town,
Ichihara City, Chiba City (Inage Ward, Hanamigawa Ward, Nishi Ward,
Chuo Ward, Mihama Ward, Midori Ward), Funabashi City, Ichikomiya Town,
Choshi Village, Chonan Town, Nagara Town, Shirako Town, Matsuzawa Town,
Togane City, Yachiata City, Yachiyo City, Mobara City

No.E
Kanna Town, Minano Town, Ogano Town, Chichibu City, Yorii Town,
Nagatore Town, Higashichichibu Village, Yokosue Town, Hanno City,
Ogawa Town, Tokigawa Town, Ranzan Town

No.F
Yokosuka City, Yokohama City (Isogo Ward, Sakae Ward, Kanazawa Ward,
Konan Ward), Kamakura City, Chigasaki City, Hayama Town, Eushi City,
Fujisawa City

No.G
Kamagaya City, Funabashi City, Shiroi City

No.H
Kawasaki City (Saiki Ward*, Kawasaki Ward*)

No.I
Midori City, Iseaki City, Kiryu City, Tamamura Town, Maebashi City

No.J
Aikawa Town, Kiyokawa Village, Ayase City, Isehara City, Ebina City,
Chigasaki City, Atsugi City, Samukawa Town, Zama City, Sagami-hara City
(Chuo Ward, Mihama Ward), Yamato City, Fujisawa City, Hiratsuka City

No.K
Shibukawa City, Maebashi City, Shouwa Village

No.L
Ayase City, Yokohama City (Sakae Ward, Totsuka Ward, Konan Ward,
Izum Ward), Kamakura City, Chigasaki City, Yamato City, Fujisawa City,
Hiratsuka City

Regarding railroad systems, TEPCO is endeavoring to secure continuous
supply of electricity. For this reason, rolling blackout may not be
implemented in some areas.

*Newly applicable areas due to operations from substations. However,
those areas could be out of the target if the network systems change in
future.

[Back to page top](#)

Press Releases

Press Release (Mar 16, 2011)

Implementation plan of rolling blackout on and after Thurs, March 17, 2011

Due to the power supply-demand balance, TEPCO has been implementing rolling blackout on and after Monday, March 14. We sincerely regret to cause the anxiety and inconvenience to our customers and the society. We appreciate your cooperation in conserving electricity consumption.

Implementation plan of rolling blackout on Thurs, March 17
Regional block and time periods planned to have rolling blackout based on electricity supply-demand today are as follows. The actual extension of blackout for each block are planned to be up to approximately 3 hours each.

For customers who will be subject to rolling blackout, please be prepared for the announced blackout periods. Also for customers who are not subject to blackouts, TEPCO appreciates your continuous cooperation in reducing electricity usage by avoiding using unnecessary lighting and electrical equipment.

[Expected rolling blackout time periods in each region]

Block 5: 6:20 - 10:00
Block 1: 9:20 - 13:00
Block 2: 12:20 - 16:00
Block 5: 13:50 - 17:30
Block 3: 15:20 - 19:00
Block 1: 16:50 - 20:30
Block 4: 18:20 - 22:00

• Please refer to the attachment1 for the detailed region of the blocks.
(The website of TEPCO provides information including "Chome".
<http://www.tepco.co.jp/index-j.html>)

• Starting and ending time of blackout periods may slightly differ.
• Depending on supply and demand conditions on the actual days, planned blackouts may not be carried out. In addition, in case electricity supply and demand exceeds our forecast, we will reconsider the rolling blackout plan and inform you before we implement the revised planned blackouts.

• The blackout may occur in the adjacent areas where the planned blackouts are carried out.

Implementation plan of rolling blackout from Fri, March 18 to Tue, March 22 Please refer to the attachment2 for the detailed plan.

• Please refer to the attachment1 for the detailed region of the blocks.
• The rolling blackout will be changed every day. Starting and ending time of blackout periods may slightly differ.

• Depending on supply and demand conditions on the actual days, planned blackouts may not be carried out. Also, in case supply and demand exceeds our forecast, we will reconsider planned blackouts and inform you before we implement the new planned blackouts.

[Others]

- In order to prevent fire, please make sure to switch off the electric appliances such as hair drier and to shut down the breaker of distribution board when you leave your house.
- For the customer who has in-house power generation, please secure fuel for generator.

[Improvement for implementing planned blackouts]

- We are basically carrying out the existing plans, but realize that they have problems. We will consider and improve implementation plans from the customers' point of view.

<Reference>

o Prediction of Demand and Supply on March 16
Estimated Demand 35,000 MW (18:00-19:00)
Supply Capacity 33,000 MW

o Expected demand and supply on March 17
Estimated Demand 38,000 MW (18:00-19:00)
Supply Capacity 33,500 MW

Appendices:

attachment1: Group1 (PDF 9.35KB)
: Group2 (PDF 10.1KB)
: Group3 (PDF 9.81KB)
: Group4 (PDF 10.0KB)
: Group5 (PDF 12.7KB)
attachment2: Weekly Schedule of Rolling Blackout (planned) (PDF 18.1KB)

[Back to Page Top](#)

Press Releases

Press Release (Mar 16, 2011)

Impact to TEPCO's Facilities due to Tohoku-Taiheiyu-Oki Earthquake (as of 10:00PM)

Due to the Tohoku-Taiheiyu-Oki Earthquake which occurred on March 11th 2011, TEPCO's facilities including our nuclear power stations have been severely damaged. We deeply apologize for the anxiety and inconvenience caused.

Below is the status of TEPCO's major facilities.

*new items are underlined

[Nuclear Power Station]

Fukushima Daiichi Nuclear Power Station:

Units 1 to 3: shutdown due to earthquake

(Units 4 to 6: outage due to regular inspection)

* The national government has instructed to evacuate for those local residents within 20km radius of the site periphery and to remain indoors for those local residents between 20km and 30km radius of the site periphery.

* Unit 1

The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th. We have started injection of sea water at 8:20 pm and then boric acid into the reactor afterwards.

* Unit 2

At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in article 15, clause 1 occurred (failure of reactor cooling function). At 5:17 pm, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.

At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.

Sea water injection to the reactor is still under operation.

* Unit 3

At 6:50 am, March 14th, while water injection to the reactor was under operation, the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific

*Unit 3

At 6:50 am, March 14th, while water injection to the reactor was under operation, the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure has gradually decreased (as of 9:05 am, 450 kPa).

At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them are conscious) have sustained injuries and they were already dispatched to the hospital by ambulances.

*Unit 4

At approximately 6:00 am, March 15th, an explosive sound occurred and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employee confirmed that the fire was off.

At approximately 5:45 am, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and prepared to extinguish the fire. However, during an inspection at approximately 6:15 am, TEPCO staff found no signs of fire.

Fukushima Daini Nuclear Power Station:

Units 1 to 4: shutdown due to earthquake

*The national government has instructed evacuation for those local residents within 10km radius of the periphery.

*As the radiation dose at the site boundary exceeded the limitation, it was determined that a specific incident stipulated in article 15, clause 1 occurred (Extraordinary increase of radiation dose at site boundary) at 9:58 pm, March 14th and at 0:00 am, March 15th.

*Reactor cooling function was restored and cooling of reactors was conducted. As a result, all reactors achieved cold shutdown: Unit 1 at 5:00 pm, March 14th, Unit 2 at 6:00 pm, March 14th, Unit 3 at 0:15 pm, March 12th, Unit 4 at 1:15 am, March 15th.

* (Unit 1)

As it is confirmed that the temperature of the Emergency Equipment Cooling Water System^{*1} has increased, at 3:20 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 4:25 pm, March 15th, after replacing the power facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

* (Unit 4)

As it is confirmed that the pressure at the outlet of the pumps of the Emergency Equipment Cooling Water System^{*1} has been decreased, at 8:45 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 9:25 pm, March 15th, after replacing the relevant facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

*1: emergency water system in which cooling water (pure water) circulates which exchanged the heat with sea water in order to cool down bearing pumps and/or heat exchangers etc.

Kashiwazaki Kariwa Nuclear Power Station:

Units 1, 5, 6, 7: normal operation
Units 2 to 4: outage due to regular inspection

[Thermal Power Station]

Hirono Thermal Power Station Units 2 and 4: shutdown due to earthquake
Hitachinaka Thermal Power Station Unit 1: shutdown due to earthquake
Kashima Thermal Power Station Units 2, 3, 5, 6: shutdown due to earthquake
Ohi Thermal Power Station Unit 2: shutdown due to earthquake
Higashi-Ohgishima Thermal Power Station Unit 1: shutdown due to earthquake

[Hydro Power Station]

* All the stations have been restored.

[Transmission System, etc.]

All substation failed due to the earthquake have been restored.

[Blackout in TEPCO's Service Area]

Total of about 5,100 households are out of power.

Tokyo: 0

Kanagawa Pref.: 0

Tochigi Pref.: 0

Chiba Pref.: 0

Saitama Pref.: 0

Gunma Pref.: 0

Ibaraki Pref.: 5,100

Yamanashi Pref.: 0

Shizuoka Pref.: 0 (east of Fuji River)

[Supply and Demand Status within TEPCO's Service Area to Secure Stable Power Supply]

Backup supply from Shinshinano Conversion Station: 600MW

Backup supply from Sakuma Conversion Station: 300MW

Backup supply from Higashi Shimizu Conversion Station: 100MW

Backup supply from Kitahon Interconnection Facility: 600MW

Considering the critical balance of our power supply capacity and expected power demand forward, in order to avoid unexpected blackout, TEPCO has implemented rolling blackout (planned blackout alternates from one area to another) since yesterday. We will make our utmost to secure the stable power supply as early as possible.

For customers who will be subject to rolling blackout, please be prepared for the announced blackout periods. Also for customers who are not subject to blackouts, TEPCO appreciates your continuous cooperation in reducing electricity usage by avoiding using unnecessary lighting and electrical equipment.

[Others]

Please do NOT touch cut-off electric wires.

In order to prevent fire, please make sure to switch off the electric appliances such as hair drier and to shut down the breaker of distribution board when you leave your house.

For the customer who has in-house power generation, please secure fuel for generator.

[Back to page top](#)

Press Releases

Press Release (Mar 16, 2011)

Wednesday (March 16th): Group 3 (Original Scheduled Time: 18:20PM - 22:00PM)

- Blackout Period: Approximately 3 hours (18:20PM - 22:00PM)
- Expected Number of Blackouts: Approximately 2,620,000 customers
- Targeted Region: Saitama pref., Tokyo, Chiba pref., Tochigi Pref.,
Gunma pref., Yamanashi pref., Kanagawa pref.

No.	Areas
A	Fujimino City, Shiki City, Niiza City, Asaka City, Miyoshi Town, Itabashi Ward, Fujimi City, Wako City, Nerima Ward
B	Inzai City, Shisui Town, Abiko City, Sakura City (Chiba Pref.), Shibayama Town, Oamishirosato Town, Narita City, Shirai City, Yachimata City, Tomisato City
C	Akiruno City, Hamura City, Akishima City, Okutama Town, Mizuho Town, Hinode Town, Hinohara Village, Oume Town, Hachioji City, Musashimurayama City, Fussa City, Kosuge Village, Tabayama Village, Iruma City, Moroyama Town, Hanno City, Tokorozawa City
D	Utsunomiya City, Shioya Town, Mibu Town, Shimotsuke City, Kamimikawa Town, Kanuma City, Nishikata Town, Tochigi City, Nikko City
E	Saitama City (Urawa Ward, Iwatsuki Ward, Minuma Ward, Nishi Ward, Omiya Ward, Chuou Ward, Kita Ward, Midori Ward), Kasukabe City, Miyashiro Town, Sugito Town
F	Kai City, Kofu City, Nirasaki City, Hokuto City
G	Odawara City, Hadano City, Manazuru City, Yugawara Town, Matsuda Town, Minamiasagaya City, Atami City*
H	Kokubunji City, Kunitachi City, Mitaka City, Koganei City, Kodaira City, Akishima City, Nishitokyo City, Chofu City, Higashimurayama City, Higashiyamato City, Fuchu City, Musashimurayama City, Musashino City, Tachikawa City
I	Tatebayashi City, Ota City, Chiyoda Town, Oizumi Town, Oura Town, Moka City, Ashikaga City
J	Saitama City (Urawa Ward, Minuma Ward, Sakura Ward, Nishi Ward, Omiya Ward, Chuo Ward, Minami Ward, Kita Ward, Midori Ward), Hanyu City, Okegawa City, Toda City, Gyoda City, Kobasu City, Ageo City, Ina Town, Kitamoto City, Hasuda City, Warahi City
K	Yokosuka City, Kamakura City, Hayama Town, Miura City, Zushi City
L	Utsunomiya City, Maetsume Town, Mibu Town, Shimotsuke City, Kaminokawa Town, Sano City, Kanuma City, Oyama City, Moka City, Ashikaga City, Tochigi City, Nikko City, Nishikata Town, Shioya Town
M	Isesaki City, Kumagaya City, Gyoda City, Kamisato Town, Kamikawa Town, Misato Town, Fukaya City, Ota City, Yori Town, Higashimatsuyama City, Namegawa Town, Yoshimi Town, Ogawa Town, Ranzan Town, Honjo City, Oizumi Town
N	Yokohama City (Sakae Ward, Totsuka Ward, Konan Ward)

*1: Locations are divided into each blocks based on each substation's coverage area.

*2: Shizuoka prefecture including Atami City is not subject to the rolling blackout, however, customers in Atami City whose power is supplied through inter-prefecture lines from the prefecture subject to the rolling blackout may have blackout.

[back to page top](#)

Press Releases

Press Release (Mar 16, 2011)

Fire occurrence at Fukushima Daiichi Nuclear Power Station Unit 4

At approximately 5:45 am, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building while transporting a battery to the central control room of Unit 4 of Fukushima Daiichi Nuclear Power Station.

TEPCO immediately reported this incident to the fire department and the local government. In addition, TEPCO also contacted related parties about this incident and began immediate preparations to extinguish the fire.

[☐ back to page top](#)

Press Releases

Press Release (Mar 16, 2011)

Fire occurrence at Fukushima Daiichi Nuclear Power Station Unit 4 (2nd Release)

At approximately 5:45 am, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building while transporting a battery to the central control room of Unit 4 of Fukushima Daiichi Nuclear Power Station.

TEPCO immediately reported this incident to the fire department and the local government. In addition, TEPCO also contacted related parties about this incident and began immediate preparations to extinguish the fire. (previously announced)

However, during an inspection at approximately 6:45 am, TEPCO staff found no signs of fire. The area will be kept under strict surveillance.

[Back to page top](#)

Press Releases

Press Release (Mar 16, 2011)

Impact to TEPCO's Facilities due to Tohoku-Taiheiyou-Oki Earthquake (as of 2:00PM)

Below is the status of TEPCO's major facilities that suffered from the Tohoku-Taiheiyou-Oki Earthquake that occurred at 2:46PM, March 11th 2011.
*new items are underlined

[Nuclear Power Station]

Fukushima Daiichi Nuclear Power Station:

Units 1 to 3: shutdown due to earthquake

Units 4 to 6: outage due to regular inspection at the occurrence of earthquake

*The national government has instructed to evacuate for those local residents within 20km radius of the site periphery and to remain indoors for those local residents within 30km radius of the site periphery.

*Since the value of radioactive materials (iodine, etc) at the site (outside) measured by monitoring car exceeded the ordinary level, it was determined that a specific incident stipulated in article 15, clause 1 occurred (Extraordinary increase of radiation dose at site boundary).

- 4:17 pm, March 15th at the main gate of the site
- 11:05 pm, March 15th at the main gate of the site

* Unit 1

The explosive sound and white smoke was confirmed near Unit 1 after the big quake occurred at 3:36pm, March 12th. We have started sea water injection at 8:20 pm and then boric acid into the reactor.

*Unit 2

At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in article 15, clause 1 occurred (failure of reactor cooling function). At 5:17 pm, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation. At approximately 6:14 am, March 15th, the extraordinary sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something extraordinary happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location. Sea water injection to the reactor is still under operation.

*Unit 3

At 6:55 am, March 14th, while water injection to the reactor was under operation, the pressure in the reactor containment vessel increased to 550 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure has gradually decreased (as of 9:05 am, 450 kPa).

At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them are conscious) have sustained injuries and they were already dispatched to the hospital by ambulances.

*Unit 4

At approximately 6:00 am, March 15th, an explosive sound occurred and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employee confirmed that the fire was off.

At approximately 5:45 am, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and prepared to extinguish the fire. However, during an inspection at approximately 6:15 am, TEPCO staff found no signs of fire.

Fukushima Daiichi Nuclear Power Station:

Units 1 to 4: shutdown due to earthquake

*The national government has instructed evacuation for those local residents within 10km radius of the periphery.

*As the radiation dose at the site boundary exceeded the limitation, it was determined that a specific incident stipulated in article 15, clause 1 occurred (Extraordinary increase of radiation dose at site boundary) at 9:58 pm, March 14th and at 0:00 am, March 15th.

*Reactor cooling function was restored and cooling of reactors was conducted. As a result, all reactors achieved cold shutdown: Unit 1 at 5:00 pm, March 14th, Unit 2 at 6:00 pm, March 14th, Unit 3 at 0:15 pm, March 12th, Unit 4 at 7:15 am, March 15th.

• (Unit 1)

As it is confirmed that the temperature of the Emergency Equipment Cooling Water System¹ has increased, at 3:20 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 4:25 pm, March 15th, after replacing the power facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

• (Unit 4)

As it is confirmed that the pressure at the outlet of the pumps of the Emergency Equipment Cooling Water System¹ has been decreased, at 8:05 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 9:25 pm, March 15th, after replacing the relevant facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

¹: emergency water system in which cooling water (pure water) circulates which exchanged the heat with sea water in order to cool down bearing pumps and/or heat exchangers etc.

Kashiwazaki Kariwa Nuclear Power Station:

Units 1, 5, 6, 7: normal operation

Units 2 to 4: outage due to regular inspection

[Thermal Power Station]

Hirono Thermal Power Station Units 2 and 4: shutdown due to earthquake

Hitachinaka Thermal Power Station Unit 1: shutdown due to earthquake

Kashima Thermal Power Station Units 2, 3, 5, 6: shutdown due to earthquake

Ohi Thermal Power Station Unit 2: shutdown due to earthquake

Higashi-Ogishima Thermal Power Station Unit 1: shutdown due to earthquake

[Hydro Power Station]

* All the stations have been restored.

[Transmission System, etc.]

All substation failed due to the earthquake have been restored.

[Blackout in TEPCO's Service Area]

Total of about 5,100 households are out of power.

Tokyo: 0

Kanagawa Pref.: 0

Tochigi Pref.: 0

Chiba Pref.: 0

Saitama Pref.: 0

Gunma Pref.: 0

Ibaraki Pref.: 5,100

Yamanashi Pref.: 0

Shizuoka Pref.: 0 (east of Fuji River)

[Supply and Demand Status within TEPCO's Service Area to Secure Stable Power Supply]

Backup supply from Shinshinano Conversion Station: 600MW

Backup supply from Sakuma Conversion Station: 300MW

Backup supply from Higashi Shimizu Conversion Station: 100MW

Backup supply from Kitahon Interconnection Facility: 600MW

Considering the critical balance of our power supply capacity and expected power demand forward, in order to avoid unexpected blackout, TEPCO has implemented rolling blackout (planned blackout alternates from one area to another) since yesterday. We will make our utmost to secure the stable power supply as early as possible.

For customers who will be subject to rolling blackout, please be prepared for the announced blackout periods. Also for customers who are not subject to blackouts, TEPCO appreciates your continuous cooperation in reducing electricity usage by avoiding using unnecessary lighting and electrical equipment.

[Others]

Please do NOT touch cut-off electric wires.

In order to prevent fire, please make sure to switch off the electric appliances such as hair drier and to shut down the breaker of distribution board when you leave your house.

For the customer who has in-house power generation, please secure fuel for generator.

[back to page top](#)

NOT FOR PUBLIC DISCLOSURE

Press Releases

Press Release (Mar 16, 2011) Transfer of Fukushima Dai-ichi Power Station Workers

At approximately 6:00 today, an abnormal noise began emanating from nearby the pressure suppression chamber of Fukushima Dai-ichi Power Station. Given that the pressure within this chamber had decreased, it was believed that this was an indication that an abnormality had arisen. From this point on, while water injection operations are still underway, the temporary transfer to a safe place of TEPCO employees and workers from other companies not directly involved with this work has begun. Currently, at Fukushima Dai-ichi Power Station, the remaining workers are doing their best to secure the safety and security of the site.

The parameters for Unit 2's nuclear containment vessel and the containment vessel show no significant change.

We are aware of and sincerely apologize for the great distress and inconvenience this incident has caused to not just those inhabitants residing in the immediate vicinity but also society at large.

[back to page top](#)

Press Releases

Press Release (Mar 16, 2011)

Wednesday (March 16th): Group 2 (Original Scheduled Time: 15:20PM - 19:00PM)

- Blackout Period: Approximately 3 hours (15:20PM - 19:00PM)
- Expected Number of Blackouts: Approximately 3,060,000 customers
- Targeted Region: Saitama pref., Chiba pref., Kanagawa pref., Tokyo, Tochigi Pref., Yamanashi pref.

Rolling blackout areas (15:20PM - 19:00PM)

No	Areas
A	Sayama City, Sakado City, Tokorozawa City, Kawagoe City, Tsurugashima City, Hidaka City, Ogose Town, Moroyama Town, Iruma City, Hanno City, Tokigawa Town, Kawashima Town
B	Sakura City (Chiba pref.), Narashino City, Yachiyo City
C	Kawasaki City (Asao Ward)
D	Hanyu City, Goka Town, Okegawa City, Kazo City, Kuki City, Kumagaya City, Satte City, Gyoda City, Koumoku City, Ageo City, Shiroka Town, Kitamoto City
E	Inagi City, Komae City, Mitaka City, Koganei City, Maeda City, Chofu City, Fuchu City, Musashino City
F	Iwafune Town, Nogi Town, Kanuma City, Oyama City, Tochigi City
G	Saitama City (Urawa Ward, Sakura Ward, Omiya Ward, Chuo Ward, Minami Ward, Midori Ward), Koshigaya City, Yoshikawa City, Toda City, Misato City, Kasukabe City, Kawaguchi City, Soka City, Matsubushi Town, Warabi City
H	Ichikawa City, Matsudo City, Funabashi City
I	Chigasaki City, Samukawa Town, Oiso Town, Hiratsuka City
J	Kanagawa City, Ichikawa City, Narashino City, Chiba City (Hanamigawa Ward, Wakaba Ward, Mihama Ward, Midori Ward), Funabashi City, Yachiyo City
K	Hino City, Hachioji City
L	Akishima City, Hino City, Hachioji City
M	Saitama City (Urawa Ward, Iwatsuki Ward, Sakura Ward, Minami Ward, Midori Ward), Koshigaya City, Kazo City, Kuki City, Toda City, Satte City, Kasukabe City, Kawaguchi City, Miyashiro Town, Shiroka Town, Matsubushi Town, Sugito Town
N	Kofu City, Ichikawamisato Town, Chuo City, Fuefuki City, Manami-Arupusu City, Fujikawa Town
O	Ayase City, Yokohama City (Asahi Ward, Seiya Ward, Aoba Ward, Izumi Ward, Tazuki Ward, Hodogaya Ward, Midori Ward), Ebina City, Yamato City
P	Kunitachi City, Mitaka City, Tama City, Machida City, Chofu City, Hino City, Hachioji City, Fuchu City

[Back to Page Top](#)

Press Releases

Press Release (Mar 16, 2011)

Wednesday (March 16th): Group 1 (Original Scheduled Time: 12:20PM - 16:00PM)

- Blackout Period: Approximately 3 hours (12:20PM - 16:00PM)
- Expected Number of Blackouts: Approximately 2,390,000 customers
- Targeted Region: Saitama pref., Chiba pref., Gunma pref., Kanagawa pref.

Rolling blackout areas (12:20PM - 16:00PM)

No	Areas
A	Saitama City (Nishi Ward), Fujimino City, Sayama City, Sakado City, Shiki City, Tokorozawa City, Niiza City, Kawagoe City, Asaka City, Miyoshi Town, Iruma City, Fujimi City, Wako City
B	Isumi City, Sakura City, Oamishirasato Town, Ichihara City, Chiba City (Inage Ward, Hanamigawa Ward, Wakaba Ward, Chuo Ward, Mihama Ward, Midori Ward), Funabashi City, Ichinomiya Town, Chosei Village, Chonan Town, Nagara Town, Shirako Town, Mutsuzawa Town, Togane City, Yachiyo City, Tachiyō City, Mobara City
C	Kanma Town, Minano Town, Ogano Town, Chichibu City, Yorii Town, Nagatoro Town, Higashichichibu Village, Yokoze Town, Hama City, Ogawa Town, Tokigawa Town, Ramzan Town
D	Yokosuka City, Yokohama City (Isogo Ward, Sakae Ward, Kanazawa Ward, Konan Ward), Kamakura City, Chigasaki City, Hayama Town, Zushi City, Fujisawa City
E	Kanagawa City, Funabashi City, Shiroi City
F	Midori City, Isesaki City, Kashi City, Tamamura Town, Maebashi City
G	Aikawa Town, Kiyokawa Village, Ayase City, Ischira City, Ebina City, Chigasaki City, Atsugi City, Samukawa Town, Zama City, Sagami City (Chuo Ward, Minami Ward, Yamato City, Fujisawa City, Hiratsuka City
H	Shibukawa City, Maebashi City, Showa Village
I	Ayase City, Yokohama City (Sakae Ward, Totsuka Ward, Konan Ward, Izumi Ward), Kanagawa City, Chigasaki City, Yamato City, Fujisawa City, Hiratsuka City

[back to page top](#)

Press Releases

Press Release (Mar 16, 2011)

Wednesday (March 16th): Group 5 (Original Scheduled Time: 9:20 - 13:00PM)

- Blackout Period: Approximately 3 hours (9:20AM - 13:00PM)
- Expected Number of Blackouts: Approximately 2,320,000 customers
- Targeted Region: Saitama pref., Yamanashi pref., Gunma pref., Tokyo, Kanagawa pref., Tochigi pref., Chiba pref.

Rolling blackout areas (9:20AM - 13:00PM)

No	Areas
A	Misato City, Soka City, Yashio City
B	Koshu City, Rai City, Yamanashi City, Uenohara City, Otsuki City, Fuefuki City, Tsuru City, Yamanakako Village, Nishikatsura Town, Doshi Village, Oshino Village, Fujikawaguchiko Town, Narusawa Village, Fujiyoshida City, Kosuge Village
C	Annaka City, Shimonita Town, Kanra Town, Nannmoku Village, Takasaki City, Tamamura Town, Kamisato Town, Kamikawa Town, Misato Town, Fukaya City, Ueno Village, Kanna Town, Chichibu City, Fujioka City, Tomioka City, Honjo City
D	Koshigaya City, Arakawa Ward, Misato City, Kawaguchi City, Soka City, Adachi Ward, Yashio City
E	Yokohama City (Kohoku Ward, Aoba Ward, Tsuzuki Ward, Midori Ward), Kawasaki City (Miyamae Ward, Takatsu Ward, Tama Ward, Nakahara Ward, Asao Ward)
F	Annaka City, Isesaki City, Kusatsu Town, Nakanojo Town, Naganojima Town, Tsumagoi Village, Higashiagatsuma Town, Takasaki City, Tamamura Town, Shibukawa City, Maebashi City, Yoshioka Town
G	Aikawa Town, Uenohara City, Sagami City (Chuo Ward, Minami Ward, Midori Ward), Otsuki City, Machida City, Shiroyama Town, Sagami Town, Tsukui Town, Tsuru City, Doshi Village
H	Sakura City (Tochigi pref.), Utsunomiya City, Shioya Town, Takanezawa Town, Mibu Town, Kaminokawa Town, Kanuma City, Otawara City, Nasukarasuyama City, Nasushiobara City, Nakagawa Town, Ichikai Town, Motegi Town, Yaita City
I	Yokohama City (Isogo Ward, Sakae Ward, Totsuka Ward, Konan Ward, Izumi Ward, Minami Ward), Kamakura City, Fujisawa City
J	Inzai City, Abiko City, Kamagaya City, Sakura City (Chiba pref.), Matsudo City, Narita City, Funabashi City, Kashiwa City, Shiroyama City, Noda City, Nagareyama City
K	Kumagaya City, Gyoda City, Fukaya City, Honjo City

[Back to page top](#)

ET Chronology Descending

datetime	source	facilities description
2011/03/11 10:51:28	ET	NRC is in monitoring mode as of 0946 EST Chronology Officer - Kevin Witt at 10:52:10 on 3/11/2011 R-IV has taken the lead EST Chronology Officer - Kevin Witt at 10:52:43 on 3/11/2011
2011/03/11 10:51:28	ET	NRC is in monitoring mode as of 0946
2011/03/11 10:51:28	ET	NRC is in monitoring mode as of 0946 EST Chronology Officer - Kevin Witt at 10:52:10 on 3/11/2011
2011/03/11 10:53:24	ET	Mike Peck is resident at Diablo Canyon and is monitoring the situation
2011/03/11 10:56:56	ET - Japanese Rep	Japanese regulator is in Emergency Operating Mode (not confirmed)
2011/03/11 10:57:55	ET - Japanese rep	Emergency Diesel Generator has been procured Fire at Onigawa in turbine building (ground floor) has been extinguished Not confirmed from Tokyo
2011/03/11 11:00:47	ET - Japanese rep	3 units were previously in outage
2011/03/11 11:02:43	ET - Japanese rep	NRC assistance is not needed at this time from Japanese regulator
2011/03/11 11:04:57	ET - Japanese Rep	Very limited access to Japanese regulators due to communications problems
2011/03/11 11:07:37	ET	Diablo Canyon is at full power and no impact is expected
2011/03/11 11:09:56	ET	Japanese representative has left ops center Next briefing scheduled for 1230 EST
2011/03/11 11:16:43	LT liaison	Crisis action team has not requested NRC support
2011/03/11 11:35:22	ET	2-3 foot water rise expected at Diablo, well within tidal fluctuation that can be handled
2011/03/11 11:39:31	ET	R-IV does not request HQ support for incident response support EST Chronology Officer - Kevin Witt at 11:40:46 on 3/11/2011
2011/03/11 11:39:31	ET	R-IV does not request HQ support
2011/03/11 12:00:03	ET	next briefing scheduled for 1:00pm EST
2011/03/11 12:17:14		[Redacted]
2011/03/11 12:51:51	ET	Cable from US Ambassador with concerning statements about Japanese reactors - question whether reactor will maintain water level (possibility for uncovering core)
2011/03/11 13:02:11	ET	NRC Staff is filling in at National Resource Coordination Center
2011/03/11 13:04:21	ET	Commissioners Assistants briefing underway
2011/03/11 13:05:58	ET	NOUE declared at Diablo canyon as of 0423 PST Some precautionary measures have been implemented; 2 foot waves observed EST Chronology Officer - Kevin Witt at 13:08:01 on 3/11/2011
2011/03/11 13:07:26	ET - R-IV Briefing	SONGS did not enter any EALs; operating normally
2011/03/11 13:05:58	ET	NOUE declared at Diablo canyon as of 0423 PST
2011/03/11 13:09:06	ET - R-IV briefing	Materials users and Humboldt Bay, agreement states have been contacted; No effects from tsunami reported
2011/03/11 13:10:04	ET - OIP briefing	14 operational BWRs near location of earthquake; 11 units were operating, all have been shut down
2011/03/11 13:12:10	ET - OIP briefing	Fire in turbine building has been extinguished; [Redacted] 3.4 meters of water above fuel level Japanese declared "Heightened State of Emergency" with precautionary evacuations No official reports of radiation leakage; News reports indicate radiation levels increasing
2011/03/11 13:18:55	ET	TEPCO website indicates LOCA report at Fukushima
2011/03/11 13:20:07	ET	LT is partially staffed working with federal partners and FEMA's radiological emergency rep
2011/03/11 13:43:57	ET	Discussed option of R-IV standing down response mode due to minimal impact on NRC licensees and HQ taking lead for liaison activities
2011/03/11 14:06:50	ET - LT update	Update from Liaison Team: [Redacted] Have the Japanese reactors exceeded their design basis? Still pursuing... -Data regarding Fukushima is being obtained -US Department of Health and Human Services (HHS) is requesting information about is [Redacted] Have we been asked for international assistance?
2011/03/11 14:29:02	ET - Japanese Rep	Length of Japanese earthquake fault is approximately 200-300 km Assumed GM magnitude (design basis) is 7.7, actual magnitude was 8.8
2011/03/11 14:32:13	ET - Japanese Rep	Discussion from Japanese rep about opening Fukushima Unit 1 vessel to relieve pressure (unconfirmed)
2011/03/11 14:51:57	ET - RIV update	Threat to R-IV licensees is diminished Waves at Diablo are still within acceptable levels
2011/03/11 14:53:43	ET - RIV Update	Stand down RIV IRC; RIV staff still maintain cognizance on international perspective

2011/03/12 05:06:31		NISA called IAEA and reported an explosion in the reactor building. NISA called IAEA and reported an explosion at the plant. EST Chronology Officer - Margie Kotzalas at 06:11:07 on 3/12/2011
2011/03/12 05:06:31		NISA called IAEA and reported an explosion in the reactor building.
2011/03/12 08:10:53		ET briefed [Redacted] from White House staff
2011/03/12 08:30:43		ET briefed EDO
2011/03/12 07:10:45	ET	ET briefed NRC Chairman (briefed on video analysis of explosion, appeared to be steam explosion)
2011/03/12 07:12:28	ET	1 NRC staff member en route to Japan, another member preparing to travel
2011/03/12 07:12:28	ET	1 NRC staff member en route to Japan
2011/03/12 07:34:28		Held CA brief
2011/03/12 08:58:05	LT	Mike Dudek reported to USAID. Jason Kozal reported to NOC
2011/03/12 09:06:28	(b)(6) INPO	Held call with (b)(6) INPO. INPO has established link through WANO Tokyo and London. INPO will provide update to CNUS. No request for assistance from WANO Tokyo or TEPCO. INPO incident response center is staffed and ready to assist if requested. CNOs indicated that they are ready to provide assistance.
2011/03/12 09:17:12	(b)(6)	UT SBO using Isocondenser plant. Reached heat capacity limit of suppression pool. Drove pressure up to 120 psi. Dose rates to CR went up 1000 times and 8 times at site boundary. Batteries hooked up. requested 40 DGs. None hooked up yet. Hydrogen explosion. Inside secondary containment, outside primary containment. SBO possibly vented primary containment. Reduced pressure by 50%. Dose rate 100mR/hr at boundary. Dropped to 7 mR/hr. Sulfur and Cs which indicates fuel melt. In process of filling containment with borated sea water. Maintaining below design pressure of containment. U2 has not reached cold shutdown yet. Working to reduce temperature. Has RCIC system. Suppression pool at saturated temp. No indication that they are cooling suppression pool. No AC power.
2011/03/12 12:40:41	ET	Senior Management status update. New Information: 40 GE Employees on site helping with outage. 4 contaminated. DOS working to assist with evacuations. CA Brief scheduled for 3:30pm.
2011/03/12 12:43:30	Chairman	(b)(5)
2011/03/12 16:54:49	ET	CA Brief. Status update. Information we have is still focused on Unit 1. Disaster response team in route. 2 NRC members. Outreach to IAEA. DHS interactions regarding consequence modeling. DOE assets staged in Las Vegas to do air monitoring. EPA monitoring west coast. May need to develop talking points for State liaisons.
2011/03/12 17:36:19	TEPCO	Status of Fukushima Daiichi NPS as of 2am JST (12pm EST) March 13: Unit 1 Reactor shutdown, subsequent explosion. Injecting sea water and boric acid into core. Unit 2 Reactor and RCIC shut down. Water level lower than normal but steady. Preparing to reduce vessel pressure. Unit 3 Reactor shut down. Continue to inject water by High Press Core Injection System. Preparing to reduce vessel pressure. No coolant leakage inside containment. Units 4-6 Reactors had been shut down with sufficient coolant. No coolant leakage inside containment.
2011/03/12 19:22:56	ET	Chairman Update. No progress with IAEA high-level contact but receiving updates. Developing high-level Q&As for 8pm review by Chairman. Next Chairman update 10pm. Next CA brief 11:30pm.
2011/03/12 19:33:45	NISA US Rep.	Daiichi Unit 1 may be losing water level. Possible problem with pump. NISA US Rep. Michael Chinworth. EST Chronology Officer - Alan Frazier at 19:33:45 on 3/12/2011
2011/03/12 19:48:21	ET	[Redacted]
2011/03/12 19:33:45	NISA US Rep.	Daiichi Unit 1 may be losing water level. Possible problem with pump.
2011/03/12 21:18:18	Japan Chief Cabinet Secretary News Conference	TEPCO informed Japanese Cabinet that Unit 3 water injection stopped and water level decreased exposing fuel. At 9:05pm JST began to inject water (not sea water). Added boric acid at 9:25pm JST and vented containment.
2011/03/12 21:48:21	DOE Dep. Sec. Posenman	Will arrange a multi-agency call to share information and align messages. Time TBD.
2011/03/12 21:48:37	Ambassador Roos	[Redacted]
2011/03/12 22:14:21	ET	Chairman contacted [Redacted]
2011/03/12 23:15:00	ET	White House Situation Room call expected at 11:30 PM EST. No change from last Situation Room briefing. Uncertainty remains on Unit 3 status. ET will send talking points to the Chairman for the 11:30 briefing.
2011/03/12 23:47:21	ET	Conducted briefing of Commission offices and other NRC staff. Next briefing will be at 7:30 AM EST.

2011/03/13 01:06	Chairman	(b)(5)
2011/03/13 01:26:31	ET	OIP identified appropriate NISA contact (Neil) and per discussion with the Chairman, will provide this contact to (b)(6) for coordination.
2011/03/13 03:00:30	OIP	Received confirmation that Tony Utises has arrived in Japan at 14:23 local time.
2011/03/13 05:20:07	TEPCO Update	Update from TEPCO (12:00 PM JST): At Fukushima Daiichi Unit 3, TEPCO took action to reduce containment pressure and then reactor vessel pressure, and began injecting sea water and boric acid.
2011/03/13 06:16:38	LT/OIP	Interagency teleconference held. The Disaster Assessment Response Team (DART) has arrived in Japan. The NRC learned that Tony Utises is being flown to Tokyo for a meeting with Japanese authorities (NISA, JNES, etc.). He will then meet with Ambassador Roos to discuss messages to Americans in Japan. DART will decide on deployment of NRC staff in Japan after meetings tonight.
2011/03/13 06:57:43	Naval Reactors	Received call from Admiral Donald, Director of Naval Reactors. Coordinated call with Deputy Secretary Poneman. Navy ships operating approximately 50 miles offshore identified airborne contamination in excess of what they believe would be expected given available information (2.5 x 10-9 uCi/ml). Also, Navy personnel who ferried equipment to a Japanese ship came back contaminated on their shoes (2500 cpm). Navy indicates they believe this indicates the plume is greater than expected. NRC PMT and NR agreed to coordinate to provide information to Japanese officials.
2011/03/13 07:41:23	ET	Conducted briefing of Commission offices and other NRC staff.
2011/03/13 08:30:34	LT	Received confirmation that Jim Trapp arrived in Japan. Working on establishing contact between Jim and the U.S. Embassy.
2011/03/13 09:06:24	Chairman/ET	Conducted 9:00 AM briefing with the Chairman to discuss status, including plans for White House and NRC press releases, the call with Admiral Donald and Deputy Secretary Poneman, and staff priorities.
2011/03/13 09:14:06	Naval Reactors	Steve Troutman (NR) contacted the ET to discuss data obtained from the U.S.S. Ronald Reagan. The Navy obtained three portable air sample measurements at different times at 100 nautical miles with the following results: 7.5 x 10-9 uCi/ml (13:00), 3 x 10-9 uCi/ml (14:30), and 7.5 x 10-9 uCi/ml (17:00). In addition, at 130 nautical miles, beta/gamma shine was measured at 0.6 mrem/hr.
2011/03/13 09:46:10	ET	Tony Utises will not be able to make it to Tokyo until tomorrow due to a plane malfunction. Jim Trapp is working on getting to Tokyo now and meeting up with Ambassador Roos.
2011/03/13 10:16:49	IAEA Update	Received update from IAEA indicating reactor vessel water level for both Daiichi Units 1 and 3 below the top of active fuel (Unit 1 below indicating range and Unit 3 between 150 and 200 cm below the top of active fuel).
2011/03/13 11:25:50	DOE Naval Reactors	Navy informed Japanese Foreign Ministry of contamination encountered on US Navy and Japanese ships. Trying to find mechanism to get same information to METI, Japanese Ministry of Economy, Trade, and Industry. NR will try to work through US Embassy.
2011/03/13 13:21:24	White House Situation Room	[Redacted]
2011/03/13 13:34:59	Jim Trapp	US Disaster Response Team and US Ambassador request list of questions to ask Japanese government. RST and PMT will provide on e-mail. Trapp en route to Ambassador's residence for call with Japanese regulatory and technical experts. Possible meeting later today. EST Chronology Officer - Alan Frazier at 13:41:55 on 3/13/2011.
2011/03/13 13:34:59	Jim Trapp	US Disaster Response Team and US Ambassador request list of questions to ask Japanese government. RST and PMT will provide on e-mail.
2011/03/13 14:22:46	OPA	Press release issued 2pm. No harmful levels of radiation expected to reach US. EST Chronology Officer - Alan Frazier at 14:32:32 on 3/13/2011.
2011/03/13 14:22:46	OPA	Press release issued 2pm.
2011/03/13 14:39:28	Chairman	DOE Secretary Chu suggests we send email requesting information stopped to assess the situation. Make air sample data (from Navy) and analysis available in next situation report. Add White House Dir. of Science and Technology, John Holdren on HOO internet releases.
2011/03/13 15:22:13	Jim Trapp & Amb. Roos	Provided confirming information regarding Fukushima Daiichi Units 1 - 3 after discussion with Japanese engineer. Unit 3 is of the most concern. Face to face meeting with Japanese government regulators scheduled for 8:30am JST.
2011/03/13 15:25:51	White House and DOE	[Redacted]
2011/03/13 15:32:51	CA Brief	Status summary Fukushima Daiichi Units 1-3. USSR air sample data indicates contamination 100 nautical miles. Preparing for Congressional hearing Wednesday. Jim Trapp in Tokyo. Tony Utises delayed until Monday. Press release issued, another in the works.
2011/03/13 16:23:20	Jim Trapp	Provided some dose information from Japanese. Data from Daiichi site. Will fax tomorrow from Embassy. Next meeting with Japanese counterparts Monday 8:30am JST.
2011/03/13 19:00:41	Tony Utises	Tony called in from Tokyo, confirmed he received list of DOE questions. Will consider the questions during interactions with Japanese counterparts at 8:30am JST.
2011/03/13 19:22:13	Jim Trapp and Tony Utises	Meeting with Japanese regulator has been postponed, new time TBD. Jim was able to confirm that last night Unit 3 lost cooling water due to a "transportation problem," and pressure increased. The Japanese believe they have now restored cooling and decreased pressure. May be having instrumentation issues with Unit 3. Unit 3 remains their biggest concern.
2011/03/13 22:24:30	Jim Trapp	Reports of explosion at Fukushima Unit 3 reactor building at 11am JST. Possible Hydrogen explosion.
2011/03/13 23:25:38	LT	Confirmed hydrogen explosion in the reactor building at Fukushima Unit 3.
2011/03/13 23:38:19	ET	Completed briefing for the Commission TAs and other NRC staff. Next briefing will be at 7:30 AM.
2011/03/13 23:42:12	RST	Completed call with Jim Trapp and Tony Utises. Status update with the U.S. Embassy and Japan has been postponed as a result of the hydrogen explosion at Fukushima Daiichi Unit 3. The containment was confirmed to be intact. Japan continues to inject sea water to Units 1 and 3.

[ET Chronology 3/14/11 through 3/18/11 Redacted]

NRC TRAVELER INFORMATION IN JAPAN

NRC TRAVELERS IN JAPAN

Name	Phone Number	Email	Flight Arrival (in Eastern Daylight Time)
Jim Trapp Chief,	(b)(6)	(b)(6)	Arrived
Tony Ulises Chief, Reactor Systems Branch		Anthony.ulises@nrc.gov	Arrived
Chuck Casto Deputy Regional Administrator, Region II		Chuck.casto@nrc.gov	12:30 AM Wednesday
John Monninger Deputy Chief-of-Staff, Office of the Chairman		John.monninger@nrc.gov	8:10 PM Tuesday
Tony Nakanishi Reactor Systems Engineer, Reactor Systems Branch		Tony.nakanishi@nrc.gov	8:10 PM Tuesday
Tim Kolb Senior Reactor Engineer, Operator Licensing and Training Branch		Timothy.kolb@nrc.gov	8:10 PM Tuesday
Jack Foster Chief, Licensing Branch (FSME)		Jack.foster@nrc.gov	8:10 PM Tuesday
Bill Cook Senior Reactor Analyst		William.cook@nrc.gov	8:10 PM Tuesday
Richard Devercelly Reactor Technology Instructor, Technical Training Center		Richard.devercelly@nrc.gov	3:15 AM Wednesday
Kirk Foggie International Relations Officer		Kirk.foggie@nrc.gov	8:10 PM Tuesday
Brooke Smith International Policy Analyst		Brooke.smith@nrc.gov	8:10 PM Tuesday

HOTEL IN TOKYO

(b)(6)

ET07 Hoc

From: HOO Hoc
Sent: Wednesday, March 16, 2011 9:21 PM
To: LIA07 Hoc; OST01 HOC; OST02 HOC; OST03 HOC
Cc: ET07 Hoc
Subject: FW: Rokkasho Status (03/16/2011)

From: Haney, Catherine
Sent: Wednesday, March 16, 2011 9:08 PM
To: HOO Hoc
Cc: Weber, Michael; Sheron, Brian; Johnson, Michael; Johnson, Michael; Leeds, Eric
Subject: Fw: Rokkasho Status (03/16/2011)

Can you provide this email to the ET.

I suggest it also be included in the briefing books being prepared for the office directors (Go books).

Thanks
Cathy

From: Hiltz, Thomas
To: Haney, Catherine; Dorman, Dan; Tschiltz, Michael; Guttmann, Jack; Davis, Jack; Bailey, Marissa; Kinneman, John; HOO Hoc
Sent: Wed Mar 16 20:17:06 2011
Subject: FW: Rokkasho Status (03/16/2011)

FYI

From: Kazuhiko Hiruta [Hiruta@denjiren.com]
Sent: Wednesday, March 16, 2011 5:16 PM
To: Kazuhiko Hiruta
Subject: Rokkasho Status (03/16/2011)

Dear friends,

Though Fukushima is now in the critical situations, I remind you here that Rokkasho doesn't have problems with the earthquake. I summarize the course of the events at the Rokkasho Site.

a. The earthquake occurred at 2:46 PM on March 11.

b. Since the earthquake cut off the power supply, all facilities at the Rokkasho Site were immediately connected to emergency diesel generators and kept operating safely. It was confirmed that no fire, no damage to equipment, and no injuries to personnel occurred. Radiation levels were measured at a normal level of safety. [As of 9:00 AM on March 12 in Japan Time]

c. At 12:00 AM on March 12, it was observed that 600 liters of water spilled from a spent fuel storage pond. The spilt water was drained and appropriately recovered in liquid waste treatment system.

d. At 10:22 PM on March 13, the power supply for Reprocessing Plant was restored to the commercial electricity from the emergency diesel generator.

e. At 3:12 PM on March 14, the power supply for Enrichment Plant was restored to the commercial electricity from the emergency diesel generator.

f. At 5:10 AM on March 15, the power supply for Spent Fuel Receiving and Storage Facility was restored to the commercial electricity from the emergency diesel generator.

g. At 11:25 AM on March 15, the power supply for Vitrified Waste Storage Center (dedicated to returned waste from France and UK) was restored to the commercial electricity from the emergency diesel generator.

Currently, all facilities at the Rokkasho Site continue safe operations without any malfunctions.

Please feel free to contact me if you have questions or you need more details.

With best regards,
Kazu

=====

Kazuhiko HIRUTA

FEPC Washington Office

"The Federation of Electric Power Companies of Japan"

1901 L Street NW Suite 600 Washington, DC 20036

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fax: 202-466-6758

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CLOSED MEETING ATTENDEE LIST

DATE OF MEETING: Thursday, April 28, 2011, (OWFN 18th Floor Conference Room)

TITLE: Part 2 - Briefing on the Status of NRC Response to Events in Japan and
Briefing on Station Blackout - Security Issues (Closed Ex. 3)

CLOSED UNDER EXEMPTION(S): 3

START TIME: 11:30 AM

END TIME: 12:00 PM

SECURITY LEVEL: Safeguards Information and Security Related Information

ATTENDEES:

1. Chairman Jaczko
2. Commissioner Svinicki
3. Commissioner Apostolakis
4. Commissioner Magwood
5. Commissioner Ostendorff
6. John Monninger, OCM/GBJ
7. Tom Hipschman, OCM/GBJ
8. Michael Marshall, OCM/GBJ
9. Jeff Sharkey, OCM/KLS
10. Pat Castleman, OCM/KLS
11. Belkys Sosa, OCM/GEA
12. Mike Snodderly, OCM/GEA
13. Patty Bubar, OCM/WDM
14. Bill Orders, OCM/WDM
15. Ho Nieh, OCM/WCO
16. Mike Franovich, OCM/WCO
17. Annette Vietti-Cook, SECY
18. Rich Laurel, SECY
19. Steve Burns, DGC
20. Edward Williamson, OGC
21. Beth Serepca, OIG
22. Beth Hayden, OPA
23. Bill Borchardt, OEDO
24. Mike Weber, OEDO
25. Marty Virgilio, OEDO
26. Greg Bowman, OEDO
27. Jim Wiggins, NSIR
28. Eric Leeds, NRR
29. Bill Ruland, NRR
30. Stacy Rosenberg, NRR
31. Eric Bowman, NRR
32. Pat Hiland, NRR
33. George Wilson, NRR
34. Brian Sheron, RES
35. Jack Grobe, NRR
36. Dan Dorman, NMSS
37. Amy Cubbage, NRO
38. Nathan Sanfilippo, OEDO
39. Barry Westrich, NSIR
40. Scott Morris, NSIR

Official Transcript of Proceedings
NUCLEAR REGULATORY COMMISSION

Title: Japan's Fukushima Daiichi ET Audio File

Docket Number: (n/a)

Location: (n/a)

Date: Friday, March 11, 2011

Work Order No.: NRC-944

Pages 1-297

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4 JAPAN'S FUKUSHIMA DAIICHI ET AUDIO FILE

5 + + + + +

6 FRIDAY

7 MARCH 11, 2011

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FJ 2382 of 2725

(CONFERENCE CALL INITIATED)

9:01 a.m./03:58 a.m.

MS. HOWELL: This is going to be a briefing on the earthquake that occurred earlier today, for some of us late last evening, in Japan, and what we thought we would do is run through the background information that we currently have reported for the domestic perspective, and then at the conclusion of that we are going to have Nader Mamish and Jack Ramsey provide a summary of some international information and some impacts in the energy sector over in Japan that might be of interest to people.

I think most people have already seen on the news this morning at 2:46 p.m. at the epicenter on march 11th there was an earthquake off the coast of Honshu, Japan, 8.9 magnitude, and since that time there have been a number of aftershocks in the range of 5.5 to 5.9.

NRC staff between the headquarters operations center and Region IV made early contact on this, which was expanded at about 03:23 this morning when Diablo Canyon made a declaration of a notice of unusual event, and that was due to the issuance of a tsunami warning for coastal areas of California near

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FJ 2383 of 2725

1 Diablo Canyon.

2 MALE PARTICIPANT: Linda.

3 MS. HOWELL: Excuse me?

4 MALE PARTICIPANT: Linda, this is
5 (inaudible) sorry to interrupt you but your time, you
6 are going to be giving in central, is that correct?

7 MS. HOWELL: Yes, unless otherwise
8 stated.

9 MALE PARTICIPANT: Thank you.

10 MS. HOWELL: Okay. Diablo entered their
11 tsunami procedures which included actions such as
12 evacuating intake structures area down to 85C
13 (phonetic). Our resident inspector prepped and has
14 reported on site and if anybody has any specific
15 questions at the conclusion of the brief then he'll be
16 prepared to address those.

17 In terms of actual tsunami impact, near
18 the epicenter of the earthquake, there is a tsunami in
19 Japan was (inaudible, possibly "right where it
20 started") about 9.2 feet near Hanasaki and about 4.6
21 feet near Honshu.

22 As far as west coast warnings and
23 advisories, the tsunami warning actually extends from
24 the Oregon, Washington border down to Point
25 Conception, California, and for reference that is

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FJ 2384 of 2725

1 between Santa Barbara and Santa Maria, California.

2 South of that there is a tsunami advisory
3 that remains in effect so in terms of the plants,
4 Diablo Canyon would sit in the tsunami warning area
5 and San Onofre would sit in the tsunami advisory area.

6 Reporting for locations that have already
7 been struck by the tsunami, Midway had a 5.1 foot
8 wave. Guam and the Marianas were reporting a two-foot
9 rise in sea level. Both of those occurred earlier this
10 morning around 4:28 a.m. central time.

11 As far as Hawaii goes in terms of
12 reporting, the estimated arrival time for Hawaii
13 should be right about now, and in terms of reporting
14 that we were able to locate this morning, estimates
15 were possibly up to a two-meter wave there.

16 In Hawaii, they have already evacuated the
17 inundation zone and restricted beach roadways. As far
18 as facilities of NRC interest there are several
19 medical facilities that sit just off-of the Waikiki
20 beach area but they are at higher elevations.

21 They do possess Category 1 and 2 sources
22 so are DNMS folks will be following up with them later
23 this morning and we can report out via email or
24 through another briefing if needed in terms of any
25 impact there.

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FJ 2385 of 2725

1 In terms of projected arrival time and
2 amplitudes on the western coast, we are looking at
3 three areas of interest. The first would be Humboldt
4 Bay, and that's estimated arrival time at 7:22 Pacific
5 time, estimated wave of 1.13 meters.

6 Port San Luis is the next point of
7 interest for us and that would be closer to Diablo
8 Canyon. The estimated arrival time around 8 a.m.
9 Pacific time and wave amplitude is estimated at 2.14
10 meters.

11 And then the third point of interest is La
12 Jolla, California, with estimated arrival time of
13 around 8:40 a.m. Pacific time and an estimated 0.72
14 meter wave and that would be closer to San Onofre.

15 We have not heard of any -- having gone
16 back and reviewed procedures and actions for
17 (inaudible), they are not in a position right now
18 where they have activated or entered any abnormal
19 procedures. That might change if the warning is
20 extended further southwards.

21 In terms of federal reporting, DHS is
22 sending out awareness reports and (inaudible) have
23 been sharing notes (phonetic) with appropriate staff.
24 We can talk probably at the end of the briefing if
25 others have not gotten those reports and would like to

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FJ 2386 of 2725

1 be included in that group.

2 But FEMA's Regions IX and X are currently
3 at level one and under full activation. Fema Region IX
4 has been in contact with U.S. territories as well as
5 Hawaii and their respective emergency operations
6 centers have all been activated.

7 So that would include Guam and Hawaii have
8 activated their emergency operations centers. The
9 National Response Coordination Center is also
10 activated at level one, which is full activation, and
11 all emergency support functions are currently
12 activated.

13 FEMA does have incident management
14 assistance teams on alert and the Washington State
15 emergency operations center is expected to open and
16 assign additional personnel in response to the tsunami
17 warning. DHS at the national operations center of
18 course is going to continue to monitor.

19 And that is really all that we have for us
20 here right now. I'd ask if anybody has specific
21 questions about Diablo Canyon, perhaps if Chris or
22 Michael Peck our senior resident inspector, who are
23 both online could respond to those?

24 MR. COLLINS: Hey Linda, this is Elmo. I
25 would suggest that Michael Peck, if he would, or

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FJ 2387 of 2725

1 Chris, give just a quick summary of the Diablo design
2 and with respect to tsunami. Yes Michael, go ahead.

3 MR. PECK: Okay. They basically -- there's
4 a design basis tsunami which is generated, created
5 based on the typography of the shore outside of the
6 plant. They look at both distant and near produced
7 tsunamis.

8 They limit that the largest credible
9 tsunami is about 35 feet. The inlet structure itself
10 is built with historical devices up on top so that air
11 can still circulate through the ultimate heat sink
12 pumps given that worst case tsunami.

13 The plant itself sits about 85 feet above
14 mean sea level, so it is not expected to be affected
15 by the effects of a tsunami. Now, what we would see is
16 prior to the wave coming in, the water would come
17 rushing out and of course the circulating water pumps
18 and the ultimate heat sink pumps are likely to lose
19 net positive suction head.

20 MS. HOWELL: Thanks Michael. Does anybody
21 have any specific questions relating to Diablo Canyon?

22 MARTY: Linda, this is Marty. Good
23 morning.

24 MS. HOWELL: Good morning.

25 MARTY: The state of California, what

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FJ 2388 of 2725

1 interactions have we had with the state?

2 MS. HOWELL: None yet, Marty, but we will
3 be reaching out to California soon.

4 MARTY: Okay it would be probably good to
5 make sure they are on the same page as us with regard
6 to --

7 MS. HOWELL: Right, and we have got our
8 state liaison officer on board to do that. They have
9 not activated their emergency operations center so we
10 are going to wait until closer to their normal
11 business hours.

12 MALE PARTICIPANT: Can we say anything
13 about local beach closings in the areas that might be
14 affected?

15 MS. HOWELL: Yes. The question was
16 whether there were any beach closing that might be
17 impacted. Right now, the only thing that we have seen
18 so far is that Orange County plans to close down beach
19 access at 8 a.m. Orange County would be closer to San
20 Jose.

21 And further south there was reporting that
22 Los Angeles County does not expect or has not
23 announced any anticipated closings. We have not seen
24 any reporting on San Luis, Obispo County yet.

25 MR. PECK: This is Peck from Diablo

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FJ 2389 of 2725

1 Canyon. The highway patrol here is in the process now
2 of closing the Diablo access road, and so the station
3 has just basically dismissed all non-essential
4 personnel to leave, and then we expect the highway
5 patrol to prevent both incoming and outgoing traffic
6 until after the tsunami warning is rescinded.

7 MS. HOWELL: Michael, maybe you could
8 also expand that to reflect on how that might impact
9 any egress within the EP emergency planning zone.

10 MR. PECK: Well, other than affecting
11 Avila Beach directly, I can't believe there
12 necessarily would be a direct effect, because the
13 plant still has an unused access from the north. So I
14 don't believe there's a direct impact on emergency
15 planning.

16 MS. HOWELL: Okay, great. Thank you Mike.

17 FEMALE PARTICIPANT: The other question
18 that has been --

19 MR. BORCHARDT: Good morning, this is Bill
20 Borchardt, I am on the road right now, but what's the
21 operating status of Diablo?

22 MR. PECK: Both units are operating at
23 full power. The licensee is in the process of
24 evaluating the tsunami information as it passes Hawaii
25 and from that they will make a decision on whether to

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FJ 2390 of 2725

1 initiate a rapid shutdown.

2 MR. BORCHARDT: And that would be because
3 of the anticipated loss of net positive suction head
4 on the third (phonetic) pump?

5 MR. PECK: That is correct.

6 MR. BORCHARDT: Yes, okay. And do you have
7 any idea when they will make that decision?

8 MR. PECK: I believe they are having an
9 internal conference call right now to formulate that
10 decision.

11 MR. BORCHARDT: Okay. Well, if I could
12 just ask you to send out an email when you have the
13 results of that decision.

14 MR. PECK: Yes so I have the action, do we
15 follow up with an email following the decision on
16 whether or not to shut down Diablo or to allow it to
17 remain operating.

18 MR. BORCHARDT: Yes, thank you very much.

19 MR. WEBER: This is Mike Weber. Linda, you
20 talked about sources in Hawaii, any concerns about
21 Guam or Alaska?

22 MS. HOWELL: Thanks Mike. In Guam we only
23 have a couple of portable gauge users so risk there is
24 minimal. Alaska, we don't have any large facilities
25 along the areas where the tsunami is projected. We do

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1 have, of course, sources that are sizeable but they
2 are further inland right now, so we are not aware of
3 any risk at this point in time.

4 But my colleague from DNMS sitting across
5 the table will be looking into that shortly and we
6 would update that as necessary.

7 MR. BORCHARDT: Sounds good. Thanks, Elso,
8 are you comfortable with where we are as an agency?

9 MR. COLLINS: Yes I am Mike. I think we
10 will see -- we still have some time and I would
11 suggest we watch it unfold. If we need to, we can
12 increase our response mode but with Michael Peck on
13 site we have a good response right now.

14 MR. BORCHARDT: Okay.

15 MR. COLLINS: Any other questions for
16 Region IV?

17 MR. FARNHOLTZ: Tom Farnholtz from the --
18 regional duty officer, Region IV. I do have one
19 logbook entry that I was emailed this morning I think
20 that I should put out, and that's concerning Humboldt
21 Bay and their (inaudible, sounds like "if-sti-sea").

22 They called this morning the HOO
23 (phonetic) to say that they were in their procedures
24 for a tsunami warning on site but expected to take no
25 action. Evacuations are being conducted in the area

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FJ 2392 of 2725

1 but they will stay on site at Humboldt Bay.

2 MS. HOWELL: Thank you Tom. Elmo, did you
3 have a question?

4 MR. BORCHARDT: This is Bill again. I just
5 wanted to raise the topic of press releases, if we had
6 anything under way, and I wanted to raise some
7 sensitivity regarding interaction or anything that we
8 say to the public affairs or anything else about
9 Japan.

10 MR. BURNELL: Bill, this is Scott Burnell.
11 We have only had one call so far from Reuters and that
12 was focused more on U.S. requirements for U.S. plants.
13 We had word that Diablo had declared the UE so I
14 shared that with Reuters and explained to them it was
15 more an expected effect on the non-nuclear side of the
16 plant.

17 We don't have any press releases currently
18 working. I wouldn't expect we would do anything unless
19 Diablo upped its response level or if we decided to do
20 anything resembling activation here at headquarters.

21 MR. BORCHARDT: [REDACTED]
22 [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

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FJ 2393 of 2725

[REDACTED]
[REDACTED]
[REDACTED]

4 MR. BURNELL: I am certainly aware of that
5 Bill. I was actually the source of that
6 misunderstanding, even though I was clear, the
7 reporter's interpretation was not, so I am perfectly
8 aware of the need to be very clear of what we are and
9 are not doing.

10 MALE PARTICIPANT: Bill, I think we have
11 Nader on the phone.

12 MS. HOWELL: Before we put Nader on, I
13 was going to make one suggestion. We will have Michael
14 follow up on the proposed decision-making for Diablo
15 Canyon, and we will collect that update and forward it
16 on to the HOO so that they can distribute it, perhaps
17 via HOO highlight later this morning.

18 Let me go ahead and turn it over to you
19 for the international perspective.

20 MR. MAMISH: Thank you Linda I will just
21 say a few words and then turn it over to Jack for some
22 details. We have taken a number of actions. We have
23 got a couple of people, Kirk and Jack who have been
24 busy this morning following up on a number of issues.

25 The first thing that we have looked into

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FJ 2394 of 2725

1 is whether or not we have any one -- any of our staff
2 out on some international trip in Japan and at this
3 point we are not aware of anyone who is actually out
4 on travel.

5 We were going to have a handful of people
6 that were going to go out and because of the CR, the
7 staff pulled the plug on the trip, so we are not aware
8 of anyone who is out in Japan on some trip at this
9 point.

10 We have offered to the Japanese, we have
11 enough of the NISA staff here attending the RIC and we
12 have offered for them to come to the ops center and
13 you know, monitor the -- you know, have dialogue with
14 their staff and others in Japan, and I have just been
15 told that they are going to take us up on that offer.

16 So we expect them to come to the ops
17 center any time. And with that, the only other point I
18 wanted to make before I turn it over to Jack is that
19 NISA, the Japanese regulator, has stood up their
20 emergency preparedness emergency response facility in
21 Tokyo to monitor all the issues. Jack?

22 MR. RAMSEY: Thanks Nader. Let me just
23 catch everybody up real quickly on a couple of
24 additional things that are going on. The first thing
25 that I would mention is please remember in doing this,

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1 please look at and understand the significance of this
2 event.

3 Not just from a nuclear perspective, but
4 from a non-nuclear perspective this is a horrifically
5 bad tragedy that has struck Japan.

6 In the general area, in the immediate area
7 of where this quake has hit, there are roughly 14
8 operating BWRs in the immediate area and please
9 remember we are also looking at both the earthquake-
10 related aspects of it and the tsunami-related aspects
11 of it.

12 All of the plants in Japan are located
13 very close to the coast. If you search any of the news
14 channels right now they are actually showing pictures
15 of them.

16 What we have heard so far is that most of
17 them, most of the reactors that were actually
18 operating when the quake hit, have been shut down.
19 Pretty much all of the plants in Japan have a seismic
20 SCRAM capability and it activated.

21 What isn't clear, and what we are trying
22 to get clarification on, is what kind of damage has
23 been seen at the plant and are the plants in safe
24 shutdown conditions, again both from the earthquake
25 standpoing and from the tsunami standpoint.

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1 It's not particularly a good situation for
2 our Japanese counterparts. As Nader mentioned, quite a
3 few of their senior people as well as a number of
4 their seismic specialists were in town this week for
5 the RIC.

6 We have been working with NISA, with the
7 Japanese regulatory authority and their technical
8 support organization, JNAT (phonetic) to try to
9 understand and get some additional information on what
10 is going on with the various facilities that have been
11 affected.

12 As you can imagine, it's a very difficult
13 situation for them, but we are trying to see what we
14 can -- what kind of information we can obtain.

15 We actually have touched base as well with
16 the emergency operations center and other people at
17 IAEA. They are in the same situation we are. They are
18 trying to get some additional information and we have
19 all extended offers to them to do what we can to help
20 them with their incident response capabilities.

21 MALE PARTICIPANT: Jack, just very
22 briefly, have we received any confirmation on whether
23 or not one of the nuclear power plants, whether it has
24 power, whether it has fire in the turbine building?

25 MR. RAMSEY: No, there have been press

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FJ 2397 of 2725

1 reports that indicate fire in the turbine building. It
2 would be a BWR. We have seen a conflicting report as
3 to whether it's a fire associated with the natural gas
4 facility that is located close to the reactor, or
5 whether it's the turbine generator of the reactor
6 itself.

7 You can imagine, they have all lost off-
8 site power, they are all running on emergency AC and
9 DC power at this point in time and there just isn't
10 any additional clarification that is available right
11 now.

12 MR. MARKLEY: This is Mike Markley. I just
13 note that the seismic expert we had speaking at the
14 RIC left yesterday -- actually he left Wednesday to go
15 back home.

16 MR. RAMSEY: Okay. The only other thing
17 that I would mention, which is a secondary issue,
18 since Bill I heard you were on the phone, I knew you
19 and Marjie are heading up into Region II with our
20 Russian colleagues, the civilian facilities in Japan
21 are what is impacted by this and what's on the news.

22
23 (b)(5)

24 We have not heard

25 anything related to (b)(5) but for Bill and

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FJ 2398 of 2725

1 Marjie, there may be some interest in our Russian
2 counterparts in trying to touch base with their
3 colleagues back in Moscow.

4 MR. MAMISH: Any questions? This, you
5 know, from an international perspective, we could get
6 a number of press inquiries so we will be working with
7 OPA throughout the day to give them the latest and
8 greatest that we have heard, and I appreciate Bill's
9 caution.

10 So we will be working with them closely.

11 MICHAEL: Nader, given the misleading
12 press reporting, or the confused press reporting about
13 nuclear power plants, are we reaching back through the
14 interagency, through the federal coordination center
15 to make certain that the U.S. government is sharing
16 what we know and speaking with one voice?

17 MR. MAMISH: We will do that. We haven't
18 done that yet Michael, but we will do that. Thank you.

19 MICHAEL: Thank you. Bill are you still
20

21 MALE PARTICIPANT: We may have lost him.

22 Any other questions from back here?

23 (No response)

24 Any other topics that we need to cover?

25 (No response)

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1 MR. COLLINS: Okay Mike, I am not hearing
2 any. I think we will close out the brief. I just note
3 a couple of actions from Region IV, to reach out to
4 the state of California with what they are doing and
5 with respect to their EOC, and we will promulgate the
6 licensee's decision with respect to the operating
7 status of Diablo Canyon units.

8 I would offer that if they begin a
9 shutdown I will reconvene a decision-making phone call
10 to reconsider whether or not we need to introduce a
11 (inaudible).

12 MICHAEL: Sounds good Elmo.

13 MS. MCINTOSH: This is Angela McIntosh,
14 FSME. Can I please speak with the Region IV duty
15 officer before you get off the line please?

16 MR. HAMISH: Okay, Mike, can we have two
17 actions, very briefly, we will reach out to our
18 federal partners to make sure we speak in one voice
19 and we will stay in contact with OPA on the latest
20 information that we hear from our international
21 counterparts.

22 MICHAEL: Sounds good.

23 MR. MCDERMOTT: This is Brian McDermott. I
24 have two things, one Nader had asked that if you guys
25 are just making sure that communication channels with

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FJ 2400 of 2725

1 State Department are open. As I understand, that is
2 how we would get a formal request for any assistance.

3 The other thing is this. We will be -- set
4 up some people in the ops center to help the Japanese
5 visitors and provide what information we can.

6 MR. COLLINS: Thanks Mike. Thanks for all
7 the help.

8 MS. HOWELL: Elmo, do you see any need
9 for any further briefing, or would we like to just put
10 together a summary and this could even be following
11 projected impact times for the western coast and just
12 pull together the picture of what the impacts were?

13 MR. COLLINS: I'm not sure that I fully
14 understood your question Linda. I think it would --

15 MS. HOWELL: One, I guess do we see the
16 need for any further briefing or in lieu of that,
17 would we like to instead put together a summary on
18 impacts and status, possibly following the projected
19 impact time on the west coast?

20 MR. COLLINS: I think for the immediate,
21 let's prepare a briefing we can distribute via email
22 from what we know and from this call. If Diablo Canyon
23 begins a shutdown, let's reconvene a decision-making
24 phone call.

25 Does that make sense Linda?

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FJ 2401 of 2725

1 MS. HOWELL: Yes it does.

2 MR. COLLINS: And then --

3 MR. LEEDS: Elmo this is Eric. A thought
4 that we have here is we have an approximate time that
5 we understand the tsunami is supposed to hit Humboldt
6 Bay and Diablo, and one of the thoughts that we had
7 around the table here is that maybe we should convene
8 shortly before the tsunami hits, such that we are
9 online during that time period, you know, for 15, 20
10 minutes before and then after. Just a thought.

11 MR. COLLINS: We could certainly do that.
12 I don't know that I would I'm that comfortable --
13 if Diablo does not begin a shutdown, then we can do
14 that and get an update phone call.

15 What time would that be Linda, to schedule
16 that call?

17 MS. HOWELL: Somewhere shortly before 19
18 a.m. central.

19 MR. COLLINS: So Eric, why don't we just
20 offer a 10 a.m. central call at any rate.

21 MR. LEEDS: Good, good. Yes, I'd
22 appreciate that. You know we are just going to get on
23 -- we will call into the ops center. 10 central is 11
24 here, right, 11 o'clock. We will just get online.

25 MR. COLLINS: That way we can share

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FJ 2402 of 2725

1 whatever information we have. If the licensee begins a 22
2 plant shutdown I will reconvene a decision-making
3 phone call in advance of that.

4 MR. LEEDS: Makes sense to me, Elmo.

5 MR. COLLINS: Linda, any other questions?

6 MS. HOWELL: None from here.

7 MR. COLLINS: I appreciate that everyone
8 is at work to pull this together Linda, Region IV
9 staff, OIP, INTER (phonetic), NRR and all those who
10 have contributed, so thank you very much.

11 MALE PARTICIPANT: Thank you Elmo.

12 MALE PARTICIPANT: Pro's office is signing
13 out.

14 MS. MCINTOSH: Waiting for a duty officer.

15 MR. COLLINS: I'm here.

16 MS. MCINTOSH: Hi, yes, thank you (phone
17 interference) on the line before signing off. I just
18 wanted to make sure I understood the outreach you are
19 going to do as a result. Are you going to reach out to
20 the state of California, just with to just see where
21 they are at or --

22 MR. FARNHOLTZ: What we normally did, Bill
23 Maier is the state liaison officer here in Region IV.
24 He has notified this, he has been working the phones
25 to -- he's got a list of contacts, folks that he deals

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FJ 2403 of 2725

1 with. So whatever we can do to work with the state
2 folks to do that. I don't know any particular thing.

3 MS. MCINTOSH: Oh, okay. Okay. I just
4 wanted to make sure I understood the nature of that
5 outreach. Is he just -- I won't bother him, he's
6 probably busy, but I just wanted to kind of understand
7 the nature of that outreach.

8 MR. FARNHOLTZ: It's fairly informal. It's
9 nothing -- he knows these people personally and so he
10 gets on the phone and talks to them about what the
11 conditions are, what we can expect, what we are doing,
12 what they might be doing, how we can support them,
13 that sort of thing.

14 MS. MCINTOSH: Okay.

15 MR. MCDEERMOTT: This is Brian McDermott.
16 On that outreach, just -- the sensitivity there and
17 I'm sure Bill has it, is to make sure that we are not,
18 you know, hitting the states and locals multiple times
19 with the same -- you know, asking for information that
20 we should be getting from the FEMA regional response
21 coordinating center contacts.

22 MR. FARNHOLTZ: Right. That's a good point
23 and Bill is sensitive to that, and in fact we leave
24 all state contacts left with Bill so we don't have
25 multiple folks here at Region IV contacting state

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FJ 2404 of 2725

1 people. Bill does that all for us, so --

2 MR. MCDERMOTT: Sounds good.

3 MS. MCINTOSH: Okay, and there was one
4 other action item Region IV was going to do, maybe it
5 was related to reactors though?

6 MR. FARNHOLTZ: I didn't catch that one so
7 I am afraid I don't have any answers for you there.

8 MS. MCINTOSH: Oh, okay. I just thought I
9 heard it. Maybe I didn't. Okay. All right. And that --
10 so they are not going to distribute sort of a summary
11 of this telecon. They are just going to convene
12 shortly before, or around 10 a.m. central time, which
13 is shortly before the tsunami is due to hit Diablo
14 Canyon. I thought that's what I heard.

15 MR. FARNHOLTZ: That's what I heard as
16 well and I believe that -- unless it changes, you
17 know, if they make a decision to shut the plant down I
18 believe Elmo said he would convene earlier than that.

19 But --

20 MS. MCINTOSH: Okay, well I will be
21 calling Region IV in a half hour anyway for my normal
22 contact, you know, daily contact with them, and I
23 don't know if you would want to be part of that at
24 all, but I guess that's Region IV's decision, but
25 maybe there will be an update by then.

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FJ 2405 of 2725

1 MR. FARNHOLTZ: Yes, I am sure there will
2 be. The information is changing even as we speak so --

3 MS. MCINTOSH: Okay.

4 MR. FARNHOLTZ: Linda Howell is actually
5 kind of running the show up in the incident response
6 center for Region IV, keeping a close eye on
7 everything.

8 MS. MCINTOSH: Okay.

9 MR. FARNHOLTZ: All right?

10 MS. MCINTOSH: All right, okay thanks a
11 lot, I'll go and make sure Charlie and Scott know what
12 I know at the moment.

13 MR. FARNHOLTZ: Right, sounds good.

14 MS. MCINTOSH: All right, thanks a lot,
15 I'll talk to you later.

16 MR. FARNHOLTZ: You bet. Bye-bye.

17 MS. MCINTOSH: Bye-bye.

18 (Conference call concludes at 9:33
19 a.m., 04:30 a.m.)

20
21
22
23
24
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FJ 2406 of 2725

1 (CONFERENCE CALL INITIATED)

2 9:39 a.m./04:36 a.m.

3 MALE PARTICIPANT: Hey good morning Mr.
4 Collins, how are you doing sir?

5 MR. COLLINS: Very good this is Elmo.

6 MR. MCDERMOTT: Elmo, it's Brian
7 McDermott, we have got Mike Weber here in the ops
8 center along with Pat Hieland (phonetic) and others.
9 There seems to be a lot of activity across the agency
10 right now, Elmo, in terms of people seeking
11 information and the Chairman has put out a request for
12 talking points as well as a status report on all U.S.
13 facilities that potentially could be adversely
14 affected by the tsunami and he wants it by 10.

15 MR. COLLINS: Okay.

16 MR. WEBER: (This must be Mr. Weber since
17 Mr. Collins addresses speaker as "Mike" but unclear
18 when changeover between interlocutors occurs. I have
19 continued on assumption that this speaker is Weber
20 (below.) So here is my strategy. I think in order to
21 coordinate communications on our agency response, I
22 thought we ought to go into a monitoring mode and
23 coordinate those communications through the ops
24 center, through Region IV.

25 MR. COLLINS: I'm thinking the same thing

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FJ 2407 of 2725

1 Mike. We were on the verge of -- you know we have been
2 waiting for the last 30 to 45 minutes for a licensee
3 decision, and we are -- of course as you know we were
4 planning the playoff of that with respect to the
5 agency mode.

6 But because of the level of interest, I
7 think I agree with you, I am there ready to make a
8 decision to go to monitor -- we are already there. The
9 people, the resources are deployed, the people are in
10 place, at least in Region IV status. So --

11 MR. WEBER: What would make sense to me
12 and I'll just propose this, that you have the lead for
13 monitoring the U.S. plans and sources and that we will
14 take the lead back here on interagency coordination
15 and international aspects.

16 MR. COLLINS: Yes.

17 MR. WEBER: Does that make sense?

18 MR. COLLINS: Yes. No, that's excellent.

19 I'm just trying to decide how we actually make this
20 decision official.

21 MR. LEEDS: I think that the -- Elmo, this
22 is Eric. I think the regional administrator suggests
23 it to Kevin or concurs on it and then the agencies do
24 monitoring.

25 MALE PARTICIPANT: Yes, I understand. I

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1 didn't know you were on the phone Eric. Good.

2 MR. COLLINS: I decide to put the agency
3 in monitoring mode with your concurrence, Eric?

4 MR. LEEDS: I concur.

5 MR. COLLINS: And ops officer, would you
6 note the time?

7 MALE PARTICIPANT: Yes sir, I'll note the
8 time as 09:46 and the agency is in monitoring.

9 MS. HOWELL: Elmo, Art and I just joined.

10 MR. WEBER: You should also be aware of a
11 couple of other things. I'm told by Eliot Brenner that
12 he is about to go on a government-wide communicators'
13 conference call that OPA is going to be monitoring.

14 The Chairman has asked us to prepare some
15 talking points that he could share with the public, as
16 well as that we can share with the other federal
17 agencies.

18 And we have received a draft of those
19 talking points from Scott Burnell so we are looking at
20 them here and one other thing. We have a press release
21 from TEPCO that says that they have commenced an
22 evacuation in the vicinity of Fukushima Daiichi, and
23 it's out three kilometers in the vicinity of the
24 nuclear power station.

25 We are still unclear on the condition of

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1 that plant but the press reporting indicates that they
2 are having difficulties in terms of maintaining
3 cooling at least at one of those units.

4 MR. COLLINS: Okay thank you Mike. Yes, it

5 --

6 MS. HOWELL: Elmo, there is also another
7 update that we just pulled in San Luis, Obispo County
8 and evacuations are -- immediate evacuations are being
9 recommended to several areas around Diablo Canyon, to
10 include Port San Luis, Avila Beach, Pismo Beach,
11 Oceano and Cayucos.

12 MR. COLLINS: Okay. All right Linda. Let's
13 get the incident response center activated with, I
14 believe we already discussed the staffing we would
15 have in place.

16 MR. HOWELL: Yes, Elmo, this is Art and
17 I'll call Jim Becker and let him know we are
18 monitoring. We are expecting a decision from them
19 within minutes on what they -- (inaudible)

20 MS. HOWELL: Elmo let me -- go ahead.

21 MR. COLLINS: Well I was just going to ask
22 you at the right time, Linda, if you would for the
23 benefit of all of us, summarize what actions we have
24 outstanding and what we need to accomplish in terms of
25 communication in summary.

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FJ 2410 of 2725

1 MS. HOWELL: Certainly, and maybe Mike
2 Weber can update this if we don't have the latest.
3 One, we anticipate a decision-maker call if Diablo
4 does make a decision to shut down the plant.

5 Once that decision is made, we owe a
6 summary out to, probably going to the HOO to the
7 appropriate members of the senior management team.

8 We are still reaching out to the state of
9 California and have attempted to reach out to the
10 state of Hawaii. There are some foreign issues with
11 both of those states so we are still working that
12 issue.

13 MR. COLLINS: And I understand we have a
14 briefing of the Chairman and/or --

15 MS. HOWELL: Correct, we have an open
16 line brief scheduled for 10 a.m. with all parties who
17 had joined us earlier this morning. Jim Trapp of the
18 Chairman's office has been notified that that will
19 occur and I understand that he may join us during that
20 10 o'clock central, 11 o'clock eastern call.

21 MR. WEBER: Jim from the EDO's (phonetic)
22 office --

23 MS. HOWELL: I'm sorry, sorry Mike. And I
24 also understand that through Jim, a briefing of the
25 Chairman was scheduled for 11:45 eastern. I would

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FJ 2411 of 2725

1 expect that if the Chairman joins us at 10 o'clock
2 that may be preempted.

3 MR. WEBER: I think the Chairman is
4 planning to participate at 11 o'clock.

5 MS. HOWELL: Okay.

6 MR. WEBER: But that could change
7 obviously, if we go into response mode at a higher
8 level for Diablo or (inaudible). Linda, I'm not sure
9 when you joined the call. At 09:46, Elmo made the
10 decision to go to monitoring in conjunction with Eric.
11 Region IV is in the lead for the U.S. sites and
12 headquarters is taking the lead for tracking of the
13 international.

14 MS. HOWELL: Understood. I have also
15 just, for everyone's knowledge, have been working with
16 Nader Mamish, and Nader is going to have his staff
17 prepped to be able to join us at the 11 o'clock
18 eastern call to talk from the international
19 perspective.

20 There's been some enhanced reporting
21 about, I think it's the Onagawa plant in Japan, which
22 was the one that lost cooling systems and some
23 possible degradation of the situation there.

24 So Nader is checking in on that and will
25 brief us with whatever he has been able to capture at

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FJ 2412 of 2725

11.

MR. WEBER: Yes, we understand that it is Fukushima Daiichi.

MS. HOWELL: Okay.

MR. WEBER: And did you hear the request from the Chairman, Linda, for a status report in writing on the U.S. facilities?

MS. HOWELL: No, we had not heard about that yet.

MR. WEBER: Yes, he was looking for that around 10 o'clock, but that's in nine minutes.

MS. HOWELL: I think --

MR. WEBER: Is there any change in the status?

MS. HOWELL: No, there's been no change and I think that the status actually might get covered in the talking points.

MR. WEBER: These are the ones from Scott Burnell?

MS. HOWELL: Yes.

MR. WEBER: Okay.

MALE PARTICIPANT: There's been no change in status so there might be a change in Diablo any minute, but --

MS. HOWELL: So, right, at the present

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FJ 2413 of 2725

1 time Mike there's no change from those OPA talking
2 points.

3 MR. WEBER: Okay. o we can go ahead and
4 forward them up to the Chairman?

5 MS. HOWELL: Yes.

6 MALE PARTICIPANT: There's a -- I think
7 that what's missing is -- I don't know if the Chairman
8 would want to discuss or not -- but I understand at
9 Diablo Canyon they are evaluating whether to shut the
10 plant down, and I think we are monitoring that with
11 our on-site (inaudible). I didn't see that in the
12 talking points.

13 It's clear that we have our (inaudible) on
14 site but is it clear that -- it's just not clear that
15 they are considering what actions -- what steps would
16 be taken next which could include a plant shutdown.

17 Did you copy that?

18 MS. HOWELL: Yes we did. We could have --
19 we have got a public affairs officer here in our
20 center and we can have that added to the second
21 bullet, but I don't know if we would want to have the
22 Chairman broadcast that publicly when the decision
23 hasn't yet been made.

24 MR. WEBER: Yes, I don't know the exact
25 words Linda, but at least put in there something about

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FJ 2414 of 2725

1 the licensee is you know, monitoring it closely --

2 MS. HOWELL: Yes, we will craft that and
3 have that updated and sent up.

4 MALE PARTICIPANT: Yes, I think they're in
5 talking points so it's not a press release.

6 MR. WEBER: I think it's fair Linda, and
7 I'm sure the residents could validate this too, but
8 the licensees must have a preplanned action to address
9 this type of situation, and we are watching to make
10 sure that the --

11 MS. HOWELL: Correct.

12 MALE PARTICIPANT: -- implemented.

13 MS. HOWELL: Correct. We will get
14 something in there.

15 MALE PARTICIPANT: Okay.

16 MALE PARTICIPANT: And then that is true.
17 The licensee has implemented a number of actions.

18 MR. WEBER: All right so can you work on
19 those and then get those back here and also up to the
20 Chairman?

21 MS. HOWELL: Consider it done.

22 MR. WEBER: Thank you. Nader, are you on
23 the phone?

24 MR. MAMISH: Yes, sir.

25 MR. WEBER: Do we have any updated

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FJ 2415 of 2725

1 information on the status of the Japanese nuclear
2 facility?

3 MR. MAMISH: The latest that I have
4 received indicates that -- as you indicated, the
5 Fukushima Daiichi plant, it's Article 10 of the Act,
6 special measures, nuclear emergency, has heightened
7 alert conditions.

8 And then for the other plant, Onagawa, it
9 says some sort of a fire, CO2 extinguishment, started
10 at 17:15. I don't know what that means. So we are
11 checking into both of these issues and we are hopeful
12 that we can get an update asap.

13 MR. WEBER: Yes, we have seen a press
14 release that was issued by TEPCO as of 10 p.m. Japan
15 time and that is the press release that talks about
16 the evacuation out three kilometers, and it also
17 refers to the fire, but the fire was reported at
18 Fukushima Daini and it occurred in a service building,
19 but it was extinguished six hours before the press
20 release was issued.

21 MR. MAMISH: Okay. All right. So we will -
22 - I guess we are on for a bulletin in about an hour
23 and we will try to get an update.

24 MR. WEBER: Right, but the Chairman would
25 like, whatever our best accurate information is on the

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1 Japanese facility as of this time, that he can share
2 with other federal agencies --

3 MR. MAMISH: Okay, who is --

4 MR. WEBER: that don't have -- go ahead.

5 MR. MAMISH: Who is putting the
6 coordinated information together?

7 MR. WEBER: You are.

8 MR. MAMISH: Nono, I mean we will put
9 together the international stuff, but who do we feed
10 it to?

11 MR. WEBER: Feed it here to the ops
12 center.

13 MR. MAMISH: Okay.

14 MR. WEBER: And Region IV has the lead on
15 the U.S. facilities --

16 MR. MAMISH: Okay.

17 MR. WEBER: as reflected in the talking
18 points.

19 MR. LEEDS: Hey Mike, this is Eric. Can I
20 break in for second?

21 MR. WEBER: Sure.

22 MR. LEEDS: Yes, this is for Elmo and
23 Region IV. I know Pat Hieland is also on the line.
24 Elmo, let us know what kind of assistance NRR can
25 provide you guys in terms of seismic experts. I don't

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FJ 2417 of 2725

1 know if anybody has tapped research yet, but certainly
2 we could act as liaison to research and get you
3 whatever you need.

4 So just let us know how we can support
5 you.

6 MR. COLLINS: Okay, thank you very much
7 Eric. Sure will.

8 MR. WEBER: Eric, Pat Hieland and crew are
9 over here but they are advising us that there is a
10 meeting with the Japanese in 6D4 (phonetic) and it's
11 on seismic --

12 MR. MAMISH: Bilateral exchange.

13 MR. WEBER: Bilateral exchange and there's
14 10 or so representatives from our Japanese counterpart
15 agencies in that room.

16 MS. DEEDS: Outstanding Elmo, I know where
17 I can get you help.

18 MR. COLLINS: Okay. This is Elmo. I am
19 going to drop off this bridge, Linda, I guess, and
20 Region IV, I am anticipating an ET bridge will be
21 maintained between the ops center and the Region IV
22 team (phonetic) response center.

23 Can you confirm that Region IV?

24 (No response)

25 I'll have to go back and --

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FJ 2418 of 2725

1 MALE PARTICIPANT: Elmo, can you repeat
2 the question?

3 MR. COLLINS: I was just -- just looking
4 ahead to the complete activation of our ops center for
5 monitoring. I used a bad word.

6 MALE PARTICIPANT: I'll tell you, we are
7 staffed for monitoring.

8 MR. COLLINS: Well I think Region IV is
9 too and so we just need to get communication bridges.

10 MS. PRUETT: : Yes, Region IV is staffed
11 for monitoring. This is Troy. (Phonetic)

12 MR. COLLINS: Troy, okay, good.

13 MS. HOWELL: The full team is here Elmo.

14 MR. COLLINS: Yes, I was just looking for
15 the -- make sure this is -- will this serve as the
16 executive team bridge, this bridge?

17 MS. HOWELL: Do we have a headquarters
18 operations officer on line?

19 MALE PARTICIPANT: Yes sir, this is the ET
20 Bridge.

21 MR. COLLINS: Okay good, so we are good.

22 MS. HOWELL: Right. Elmo, and Mike; I
23 don't know if you are still on, I have provided an
24 updated to our public affairs officer for the
25 Chairman's talking points. It will be going out

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1 through Scott Burnell with a copy to Jean Marshall
2 (phonetic) and Brian McDermott in INTER.

3 MR. WEBER: Okay, and you are copying the
4 ops center on that?

5 MS. HOWELL: Yes, they will get a copy.

6 MR. WEBER: Thank you.

7 MR. MAMISH: Mike, I'm going to drop off
8 and see what information I can get from our
9 counterparts.

10 MR. WEBER: Are you sending Jack over
11 here?

12 MR. MAMISH: I was going to just do that,
13 get out of my office and do that. I may even come down
14 the center myself.

15 MR. WEBER: Okay.

16 MR. MAMISH: Thanks.

17 MR. WEBER: Thank you.

18 MR. COLLINS: Art, are you on the bridge?

19 (No response)

20 MR. COLLINS: Or Troy, would you ask Art
21 to give me a call separately? And Troy, I believe you
22 are the Region IV base team manager?

23 MS. PRUETT: I am the Region IV base team
24 manager, and I understand you want Art to call you
25 separately?

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FJ 2420 of 2725

1 MR. COLLINS: All right. Thank you very
2 much.

3 MR. LEEDS: Is Mike Weber still on? It's
4 Eric Leeds.

5 MR. WEBER: I'm here Eric.

6 MR. LEEDS: Yes, Mike, can I talk with you
7 separately? 'll give you a call on your Blackberry.

8 MR. WEBER: Well, I'm in the EF room.

9 MR. LEEDS: Okay.

10 MR. WEBER: Call me back at 201-816-5807.

11 MR. LEEDS: 5807. Got it. Thanks. I'll
12 call you back in a minute.

13 MR. WEBER: Right thanks.

14 MR. LEEDS: Thanks.

15 (Conference call concludes at 9:55

16 a.m./04:52 a.m.)
17
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FJ 2421 of 2725

(CONFERENCE CALL INITIATED)

9:57 a.m./04:53 a.m.

MALE PARTICIPANT: Mike.

MR. WEBER: Go ahead.

MALE PARTICIPANT: We have the Chairman
here.

MR. WEBER: Okay.

CHAIRMAN JACZKO: Hey Mike.

MR. WEBER: Good morning Chairman. We
understand you are looking for an update.

CHAIRMAN JACZKO: Yes.

MR. WEBER: we are going to have
(inaudible) update on the U.S. facilities and then we
will go to international programs on what we
understand of the Japanese situation, and Holly
Harrington is here to talk about the federal agency
coordination and communication.

CHAIRMAN JACZKO: Okay great. Thanks.

MR. WEBER: Want to take it, Region IV?

MS. HOWELL: Sure Mike. Currently
Humboldt Bay has notified us that they have entered
their offnormal (phonetic) procedures but they don't
anticipate the need to take any action.

Evacuations are occurring in the area

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FJ 2422 of 2725

1 around the plant --

2 CHAIRMAN JACZKO: And those evacuations
3 are for what purpose, because of the actual tsunami
4 effect?

5 MS. HOWELL: Yes, it's a precautionary
6 measure directed by local government organizations.

7 CHAIRMAN JACZKO: Okay, and we are going
8 to -- Holly you are prepared to message that
9 effectively? Because that will likely get out fairly
10 soon, that we are ordering -- that evacuations are
11 being ordered around the nuclear facility.

12 MS. HARRINGTON: Yes, Region IV is pulling
13 together a press release now that will incorporate any
14 new information plus the talking points you have
15 already seen.

16 CHAIRMAN JACZKO: Okay.

17 MS. HOWELL: The next point of interest
18 is Port San Luis and the area around Diablo Canyon.
19 The county -- San Luis, Obispo County has issued some
20 evacuation directions this morning, and I don't have a
21 time stamp on that, but basically includes Port San
22 Luis, Avila Beach, Cayucos and Oceana.

23 Diablo Canyon remains in notice of unusual
24 event for their procedures, because they are in a
25 tsunami warning area. That tsunami warning area

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FJ 2423 of 2725

1 extends from near Santa Barbara, in between Santa
2 Barbara, Santa Maria, up to the California-Oregon
3 border.

4 South of that is only a tsunami advisory
5 but the plant currently plans to remain at full power.
6 They have released all non-essential personnel from
7 the plant zone.

8 And then further south, point of interest
9 would be around La Jolla and San Onofre. That area is
10 only under tsunami advisory and San Onofre has not
11 taken any additional actions or entered any offnormal
12 procedure status at this time.

13 CHAIRMAN JACZKO: And the projection, from
14 what I understood earlier, for the wave height or
15 however we would describe it for the tsunami, is that
16 or is that not within the tsunami design basis for the
17 facility?

18 MS. HOWELL: It is within the design
19 basis for the facility at Diablo Canyon and the most
20 recent update that we received from our resident
21 inspector staff, who is on site monitoring the
22 licensee actions, is that the licensee currently
23 anticipates a three-foot wave surge at the plant
24 intake structure.

25 CHAIRMAN JACZKO: Okay.

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1 MS. HOWELL: Design basis is 30 feet.

2 CHAIRMAN JACZKO: Okay.

3 MR. WEBER: Linda, can you say something
4 briefly about the drawback and what implications it
5 may have on plant function?

6 MR. HOWELL: Mike, this is Art Howell. I
7 can speak to that. I just got off the phone with Jim
8 Becker, the site vice president. They are anticipating
9 a drawdown of approximately three feet in the intake
10 structure.

11 They have seen, experienced drawdowns due
12 to screen clogging as much as six feet without much
13 operational impact in a circ water system. That's the
14 non-safety related, Chairman. And then the OP
15 (phonetic) saltwater has additional margin which he
16 didn't quantify.

17 Right now Diablo Canyon cannot speak to
18 the period of the drawdown. They are trying to
19 estimate that based on the available data and I expect
20 them to call me back within the next few minutes if
21 they have any assessment about the period of the
22 drawdown.

23 But they believe that because of the
24 drawdown it's only going to be three feet and that
25 would be will within the design basis of the plant,

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FJ 2425 of 2725

1 and that factored heavily into their decision to stay
2 at 100 percent power.

3 MR. WEBER: Okay. And then San Onofre is
4 not in a tsunami watch, they are at a warning or an
5 advisory?

6 MS. HOWELL: They are at the advisory
7 level and so their procedures would not call for them
8 to escalate or take further actions.

9 MR. WEBER: Okay. Good. Do we have any
10 updates then from Hawaii on any materials issues?

11 MS. HOWELL: Currently we do not have any
12 updates on materials issues. We have been monitoring
13 USGS reporting and the most significant impact for
14 Hawaii was a six-foot wave in the Maui area. We have
15 extended over about a 28-minuted period.

16 MR. WEBER: But from what you have
17 reported previously Linda, am I correct that you
18 expected the sources would be out of harm's way
19 because they are away from the coastline?

20 MS. HOWELL: That's correct. In Hawaii we
21 would be looking at some hospital facilities that
22 carry category 1 and category 2 sources. But they sit
23 -- they do not sit at shoreline elevation. They are up
24 on the hill so we don't anticipate any -- didn't
25 anticipate any impact and have not yet been notified

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FJ 2426 of 2725

1 that there was any adverse impact.

2 MR. WEBER: Okay. And can you remind me,
3 is Hawaii an agreement state or not?

4 MS. HOWELL: Hawaii is not an agreement
5 state. It is a non-agreement state.

6 MR. WEBER: Okay. So there are licensees?

7 MS. HOWELL: That is correct.

8 MR. WEBER: Okay.

9 MR. WEBER: And in Guam the understanding
10 was that we only had some portable gauges --

11 MS. HOWELL: That's correct, a couple of
12 portable gauge licensees. Guam report -- its impact
13 period was at approximately 4:30 central time this
14 morning and the reporting that we saw there was just a
15 two-foot sea level rise.

16 MR. WEBER: Okay, thank you. Any other
17 reports, Region IV, on facilities or sources?

18 MS. HOWELL: None at this time. Thank you.

19 Mike

20 MR. WEBER: Okay, Nader?

21 MALE PARTICIPANT: I'm sorry, just
22 updating, we are going into monitoring mode in Region
23 IV.

24 MALE PARTICIPANT: We are in monitoring.

25 MALE PARTICIPANT: We are in monitoring,

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1 okay, and the reason for that is?

2 MALE PARTICIPANT: Coordination on the
3 communications associated with the earthquake as well
4 as the coordination with the other federal agencies.

5 MALE PARTICIPANT: Okay, thanks.

6 MR. WEBER: Okay, Nader?

7 MR. MAMISH: Okay. Chairman, there are
8 four sites that are closest to the earthquake
9 occurred, the Onagawa, which has three operating BWRs,
10 the Fukushima Daiichi, which has six operating BWRs,
11 Fukushima Daini has four operating BWRs, and Tokai,
12 which has one operating BWR.

13 A number of these units were in
14 maintenance mode. Those that were operating all are
15 (inaudible). A total of 11 units (inaudible).

16 Information that we have at this point,
17 although some of it is somewhat sketchy, is that
18 there's a significant flooding in one unit. We have
19 not been able to pinpoint which unit that is. The
20 flooding is the result of the tsunami.

21 One of the units at the Fukushima Daiichi
22 has some cooling issues, loss of feedwater for its
23 cooling system, but based on the press release that we
24 have seen, they indicate that the reactor coolant has
25 a significant amount of water for cooling and that

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1 there's no danger of the fuel being exposed.

2 CHAIRMAN JACZKO: Okay.

3 MR. MAMISH: And finally, there was
4 apparently some fire at one of the Fukushima Daini
5 units that was extinguished and there is a
6 precautionary evacuation of three kilometers around
7 all the plants that were in the vicinity where the
8 earthquake occurred.

9 CHAIRMAN JACZKO: Okay. And there have
10 been no requests for any assistance from us at this
11 point, have there?

12 MR. MAMISH: No sir.

13 CHAIRMAN JACZKO: Okay. Thanks.

14 MR. WEBER: Okay. Holly? Update on the
15 communications?

16 MS. HARRINGTON: Chairman, as you know we
17 have talking points that you and your staff already
18 have. These are if asked only at this point. We have
19 had some media inquiries, not a whole lot, and we are
20 coordinating them with one individual so that we have
21 got consistence of message.

22 CHAIRMAN JACZKO: Okay, good.

23 MS. HARRINGTON: We are now also working
24 on a press release out of Region IV, which we will
25 talk about. They are going into monitoring mode and we

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1 shall incorporate some of the generic talking points
2 that we have already got about earthquakes and tsunami
3 design basis and that sort of thing.

4 CHAIRMAN JACZKO: Okay.

5 MS. HARRINGTON: We will get that to FEMA
6 as soon as we are through our approval process and are
7 posting it. I believe FEMA will be as is customary
8 doing some sort of a round-up press release where they
9 sort of take bits and pieces from everyone's press
10 release and put it into one general response type
11 press release.

12 We did already have a nickel (phonetic)
13 call this morning, you know. There's not a lot of
14 press releases yet from most of the federal agencies.
15 A lot of folks are just sort of mobilizing and
16 standing by and that sort of thing at this point.

17 There may be a nickel call this afternoon
18 if the tsunami materializes and they are saying or
19 perhaps not, if it really turns out to not be very
20 much, then it's unlikely there will be another nickel
21 call.

22 CHAIRMAN JACZKO: Okay. Good.

23 MR. WEBER: Okay, anything else?

24 (Inaudible) do you want to summarize federal status?

25 MALE PARTICIPANT: Right now Chairman we

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1 have made contact with the National Operations Center
2 run by FEMA. We are making preps to get a liaison
3 there if needed. FEMA is itself (inaudible). We
4 understand that Administrator Fugate had a request in
5 to full staffing of their Regional Response
6 Coordination Centers in the two affected FEMA regions,
7 or potentially affected FEMA regions.

8 And we also know that they are making
9 preps internally, this is for what we call the
10 disaster-initiated review. That would be a follow up
11 if there were any impacts on the emergency planning
12 zone around one of the facilities. It's the look that
13 they do after that natural disaster to make sure that
14 reasonable assurance of the offsite ability to
15 implement emergency plans is maintained.

16 And we have coordination with them
17 actually through my division in INTER.

18 CHAIRMAN JACZKO: Okay.

19 MR. WEBER: And the National Response
20 Coordination Center is staffed up, but we were not
21 requested to send someone down there, but we are
22 pushing to get an invite to go down there so that we
23 don't have other agencies speaking for us.

24 CHAIRMAN JACZKO: Exactly, okay. And if
25 you have trouble with that Mike, let me know, and I'll

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1 raise that wherever I can, if I need to.

2 MR. WEBER: Okay. Will do. Anything else?

3 CHAIRMAN JACZKO: No, appreciate the
4 updates and next time when we do this, it would be
5 helpful for me to have some of this on a piece of
6 paper so I can refer back to it. John has done a great
7 job here of taking some copious notes but it would be
8 easier probably just to have it directly from all of
9 you.

10 MR. WEBER: Understood.

11 CHAIRMAN JACZKO: Okay. And obviously this
12 is not any serious incident here in the United States
13 yet, and -- but I appreciate everybody kind of you
14 know, responding and being prepared and obviously
15 there's a lot of just -- my biggest concern right now
16 is one, obviously, you know, making sure that things
17 stay at the plants within our expected parameters, and
18 then the other piece is just making sure we get
19 clarity of communication, because there's a lot of
20 speculation in particular about what's happening in
21 Japan that is I think leading to a bit of, I want to
22 say -- I don't want to say panic, but perhaps
23 overreaction in some places about the status of their
24 facilities.

25 MR. WEBER: Yes sir, we understand.

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1 CHAIRMAN JACZKO: Okay, great. Appreciate
2 it.

3 MR. WEBER: So next briefing is at 11
4 o'clock?

5 CHAIRMAN JACZKO: What do you think, is
6 that going to be too early?

7 MR. WEBER: It probably will be. I would
8 suggest we put that off until after the waves hit the
9 west coast and then we will have actual information on
10 what the current status is. I don't expect much will
11 change between now and then.

12 CHAIRMAN JACZKO: Okay, I'll concur with
13 that.

14 MR. WEBER: So we will shoot for 11:45?

15 CHAIRMAN JACZKO: Sure. And if it needs to
16 be a little bit later just let me know when you think
17 the right time is. So I'll anticipate something around
18 -- between noon and one let's say.

19 MR. WEBER: Okay.

20 CHAIRMAN JACZKO: Okay?

21 MR. WEBER: All right.

22 CHAIRMAN JACZKO: Thanks Mike.

23 MR. WEBER: Thank you.

24 CHAIRMAN JACZKO: Thanks everybody.

25 (Conference call concludes at 10:11 a.m./05:08 a.m.)

26

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(CONFERENCE CALL INITIATED)

53

10:11 a.m./05:08 a.m.

MS. HOWELL: Mike, this is Region IV, we are still online.

MR. WEBER: Yes, any suggested time for that next update?

MS. HOWELL: That's what I was just going to ask about.

MALE PARTICIPANT: We have worked at the EDO's office before and they were setting something up for 11:45.

MALE PARTICIPANT: I heard the Chairman say give us some more times, choose between 12 and 1.

MS. HOWELL: Yes, shall we say 12:30?

MALE PARTICIPANT: 12:30 eastern standard time.

MS. HOWELL: Okay, we will all plan to call in and Mike, I'm not sure that the talking points that OPA has prepared capture all of the tidbits yet. We can give some notes from here.

How would you like us to coordinate getting that up so that Nader can add in anything that he might have if we want to get a one-pager up to the Chairman?

MR. WEBER: Linda, we are pulling in folks

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FJ 2434 of 2725

1 for the liaison team so that's where we have the most
2 staff in terms of headquarters, so if you would just
3 funnel it to the liaison team and then we will get it
4 from OIT (phonetic) and package it.

5 MS. HOWELL: Okay, we will forward it on
6 through the HOOs and make a request that they send it
7 on to the liaison through Brian.

8 MR. WEBER: Thank you. It sounds like we
9 should plan to have a situation report for that next
10 call, right?

11 MR. MAMISH: Get the input by what, 12
12 o'clock? Does that make sense?

13 MR. WEBER: We'll let the liaison team --

14 MALE PARTICIPANT: We will pull together
15 (inaudible) and have it in here by 12 noon.

16 MR. WEBER: Okay, all right. Okay. Thanks
17 all. We are going to go on mute.

18 (Conference call concludes at 10:12
19 a.m. 05:09 a.m.)
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FJ 2435 of 2725

1 (CONFERENCE CALL INITIATED)

2 10:12 a.m./05:09 a.m.

3 MR. COLLINS: Say Troy, this is Elmo.

4 MS. PRUETT: Yes sir.

5 MR. COLLINS: Yes, just for the talking
6 points for the Chairman, you know, we, just as a
7 reminder, we do have the lead for really the U.S.
8 facilities, Region IV facilities. You know, what went
9 up already I view as just round one, we can update
10 those and probably the quicker we can pull that
11 together the better, to get a new vision to save
12 the pertinent that is pertinent.

13 MS. PRUETT: Yes, we are updating that
14 continually.

15 MR. COLLINS: Yes, okay good, I like that.
16 You are already ahead of me. Thank you.

17 MS. PRUETT: All right.

18 MALE PARTICIPANT: Elmo, you got the word
19 at 12:30 then for the next Chairman's brief?

20 MR. COLLINS: Right, right. That's right,
21 so I'll be -- let's have a couple of minutes on the
22 phone in advance of that Troy --

23 MS. PRUETT: Okay.

24 MR. COLLINS: and Linda. So I would
25 appreciate that.

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1 MS. HOWELL: Okay.

2 MR. COLLINS: Yes, thank you. I thought it
3 was a good brief Linda. Thank you very much.

4 MS. HOWELL: We are on target here, Elmo.

5 MALE PARTICIPANT: Yes sir, thank you.

6 (Conference call concludes at 10:14
7 a.m./05:11 a.m.)
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1 (CONFERENCE CALL INITIATED)

2 10:14 a.m./05:11 a.m.

3 CHRIS: Are you there Jim?

4 MR. TRAPP: Yes.

5 CHRIS: What can I do for you?

6 MR. TRAPP: Oh, no question, I just wanted
7 to coordinate and make sure that the Chairman gets the
8 information he needs.

9 CHRIS: Yes, well you know the Chairman
10 called in about 35 minutes ago.

11 MR. TRAPP: Okay.

12 CHRIS: And I think he has all he wants.
13 The next brief for the Chairman is 12:30 eastern time.

14 MR. TRAPP: Very well, it sounds like we
15 are in good shape to give him what he needs, then.

16 CHRIS: Right, and just an update, Diablo
17 still plans to stay at full power, and there's no --
18 we don't expect any significant impact to Diablo
19 Canyon at all.

20 MR. TRAPP: Very well. Thanks so much
21 Chris. Take care.

22 (Conference call concludes at 10:15
23 a.m./05:12 a.m.)
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1 (CONFERENCE CALL INITIATED)

2 10:15 a.m./05:12 a.m.

3 MALE PARTICIPANT: Region IV, are you on
4 the line?

5 MALE PARTICIPANT: Yes we are.

6 MALE PARTICIPANT: We just received an
7 update from reactor counterpart link about the status
8 of Diablo. We understand that they are experiencing a
9 one-foot drop in water level from drawback and they
10 are expecting a three-foot rise over the next couple
11 of hours from that.

12 MALE PARTICIPANT: Yes, that's the same
13 thing we heard.

14 MALE PARTICIPANT: Okay. So they are not
15 expecting any challenges from the tsunami at Diablo.
16 Is that correct?

17 MALE PARTICIPANT: That's correct.

18 MALE PARTICIPANT: Okay.

19 MALE PARTICIPANT: (Inaudible) tsunami has
20 passed?

21 MALE PARTICIPANT: I guess we can't say
22 that the tsunami has passed because they haven't seen
23 the high waves.

24 MALE PARTICIPANT: That's right. We were
25 doing some research on tsunamis here. It looks like

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1 it's a two- or a three-hour phenomenon anyway from
2 beginning to end, so -- but based on the one update
3 they only have (audio drops) a three-foot rise so --

4 MALE PARTICIPANT: Okay. We are going to
5 notify the Chairman of that information.

6 MALE PARTICIPANT: Okay.

7 MALE PARTICIPANT: Okay.

8 MALE PARTICIPANT: You know, the President
9 is planning to go on at 12:30 we understand, eastern
10 time.

11 MALE PARTICIPANT: Okay.

12 MALE PARTICIPANT: And we also understand
13 through our reachback that he does not plan to say
14 anything about the nuclear plants in Japan.

15 MALE PARTICIPANT: Okay.

16 MALE PARTICIPANT: Okay?

17 MALE PARTICIPANT: Any headquarters report
18 you need?

19 MALE PARTICIPANT: Not right now. I think
20 we are doing well.

21 MALE PARTICIPANT: Okay.

22 MS. HOWELL: One question. It's Linda. We
23 have got an update of current -- it would be 1100
24 eastern, and I am preparing (inaudible, phone
25 interference) which address or recipient would you

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1 like me to send it to?

2 MALE PARTICIPANT: You could send it just
3 to the HOOs and they'll get it to the liaison team if
4 they haven't already established it.

5 MS. HOWELL: Okay, great. I will go ahead
6 and reach back from the liaison team, separate from
7 any of our conversations, asking for a briefing for
8 the Chairman. Are we all coordinated that we are doing
9 that briefing at 12:30 eastern through a central line
10 (inaudible, phone interference).

11 MALE PARTICIPANT: They are trying to
12 collect information for the SITREP (phonetic).

13 MR. WEBER: I think the answer to your
14 question is yes, we are going to do that through a
15 coordinated call up here.

16 MS. HOWELL: Okay. I just wasn't sure if
17 there were parallel things going on, so I just wanted
18 to make sure we are all clear. Thank you.

19 MR. WEBER: Yes, we had asked the Chairman
20 what his preference was with respect to does he want
21 to avoid the conflict with the President's briefing
22 from the White House, and I think the answer was he
23 wanted to have any updates that we could provide with
24 respect to Diablo before the President goes online.

25 But as far as I know we are still planning

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1 to do the briefing at 12:30.

2 MR. MCDERMOTT: And Linda, this is Brian,
3 in advance of that, I think folks are reaching out
4 from the liaison team trying to collect up Region IV
5 input, the OIP input.

6 JEFF: Linda, Jeff (inaudible) here. The
7 Homeland Security folks just called, and this is new
8 to Mike also, they have activated and fully staffed
9 their crisis action team, the CAT team at the
10 (inaudible).

11 They do not request an NMC liaison officer
12 at this time but they do want SITREP reports sent to
13 the (inaudible) crisis action team.

14 MS. HOWELL: Okay, I can send this update
15 out to HOOs and then whoever is going to formulate the
16 SITREP reports, you could have sufficient information
17 in here to roll it down to a concise SITREP input.

18 MALE PARTICIPANT: Ned Wright and Lisa
19 Gibney (phontic) are working on that and they -- I
20 think they called you for input into that SITREP
21 report.

22 MS. HOWELL: Okay, all right, I'll cc Ned
23 Wright on this thing, okay?

24 MALE PARTICIPANT: Thanks, appreciate
25 that.

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1 MS. HOWELL: All right.

2 MR. WEBER: Linda, if you want the direct
3 email for the liaison team, it's L-I-A-O-1.H-O-C
4 (phonetic).

5 MS. HOWELL: Okay.

6 MALE PARTICIPANT: @nrc.gov.

7 MR. WEBER: Okay we are going back on
8 mute.

9 (Conference call concludes at 10:19
10 a.m./05:16 a.m.)

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FJ 2443 of 2725

1 (CONFERENCE CALL INITIATED)

2 10:20 a.m./05:17 a.m.

3 MS. HOWELL: Hey Joe?

4 JOE: Yes.

5 MS. HOWELL: Linda here. I think that
6 11:45 briefing that happened earlier, established by
7 Jim Trapp at the EDO's office was transferred to the
8 12:30 that we discussed during the last briefing

9 JOE: Okay, so there is no 11:45. The next
10 briefing is at 12:30.

11 MS. HOWELL: That's correct.

12 JOE: Okay, thank you.

13 MS. HOWELL: All right. Thanks Joe.

14 (Conference call concludes at 10:20
15 a.m./05:17 a.m.)

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FJ 2444 of 2725

1 (CONFERENCE CALL INITIATED)

2 10:21 a.m./05:18 a.m.

3 JOHN: Hey Mike, John Monenger (phonetic)
4 calling.

5 MR. WEBER: Hey John.

6 JOHN: Hey, Chairman will be back down in
7 about five minutes or so. I guess we got the message
8 that you guys wanted to -- were ready to give a
9 briefing in about 10 minutes or so.

10 MR. WEBER: Yes, we know that he wanted to
11 have an update on Diablo's situation before the
12 President goes on at 12:30.

13 JOHN: Okay, so I just wanted to get the
14 line in place before he shows up.

15 MR. WEBER: Okay.

16 JOHN: We are on mute.

17 MR. WEBER: All right. Thanks John.

18 (Conference call concludes at 10:21

19 a.m./05:18 a.m.)

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FJ 2445 of 2725

1 (CONFERENCE CALL INITIATED)

2 10:21 a.m./05:18 a.m.

3 CHAIRMAN JACZKO: Hello.

4 MR. WEBER: Hi Chairman.

5 CHAIRMAN JACZKO: Hi Mike.

6 MR. WEBER: Just to give you a brief
7 update. We understand that you are aware the President
8 goes (inaudible) at 12:30.

9 CHAIRMAN JACZKO: Yes.

10 MR. WEBER: And because of that we wanted
11 to let you know what we now know about Diablo Canyon.

12 CHAIRMAN JACZKO: Okay, great.

13 MR. WEBER: Based on reporting from the
14 site, they are experiencing about a one-foot decrease
15 in ocean level due to the drawback, and with that they
16 would expect a three-foot wave to come back, but that
17 wave rises over the span of one to two hours.

18 CHAIRMAN JACZKO: Okay.

19 MR. WEBER: So that confirmed the earlier
20 forecast that they do not expect to be threatened by
21 the tsunami at Diablo Canyon.

22 CHAIRMAN JACZKO: Okay, good.

23 MR. WEBER: And we understand that the
24 President does not intend to say anything about the
25 nuclear situation in Japan.

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FJ 2446 of 2725

1
2 CHAIRMAN JACZKO: Okay good.

3 MR. WEBER: And that's through our
4 contacts with the national security staff.

5 CHAIRMAN JACZKO: Good.

6 MR. WEBER: But I think that's the sum
7 total of what we currently understand.

8 CHAIRMAN JACZKO: Okay.

9 MR. WEBER: Would you like to have the
10 briefing at 12:30 or would you prefer to watch the
11 President?

12 CHAIRMAN JACZKO: I mean, right now, it
13 seems like there's no major issues at this point, is
14 that correct?

15 MR. WEBER: That's correct. The thing that
16 we still have a large amount of uncertainty about is
17 what is going on with respect to the Japanese plants.

18 CHAIRMAN JACZKO: Okay.

19 MR. WEBER: We had a representative of
20 JLES here in the operations center this morning. He
21 received an updated call from his contacts in Japan
22 but he was reluctant to share additional information
23 with us until he had the opportunity to confirm that
24 information.

25 CHAIRMAN JACZKO: Okay.

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1 MR. WEBER: There was some discussion
2 about getting a mobile emergency diesel generator at
3 at least one of the plants, but we were thinking that
4 there could still be some translation challenges there
5 in understanding what the current situation was.

6 CHAIRMAN JACZKO: Okay. Well, my personal
7 sense here, and please, tell me whether you agree or
8 disagree with it, is that I don't want to I don't
9 want to be a distraction to the Japanese in any way,
10 shape or form, that they are managing the event.

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16  If I need to be engaged to make sure we can
17 provide them with whatever they request. Otherwise I
18 would suggest that we continue to get information
19 where we can, but we do not do anything to burden them
20 at a time when they are more concerned about dealing
21 domestically with their issues.

22 MR. WEBER: Understood, sir, and that's
23 the position that we took in our interactions with the
24 JNES representative.

25 CHAIRMAN JACZKO: Okay. Good.

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1 MR. WEBER: We offered assistance. None
2 was requested, and so he went off and continued to
3 work his contacts to do whatever support he could
4 decide.

5 CHAIRMAN JACZKO: Okay good. Good. Well, I
6 would just suggest then that you keep me posted on
7 I'm sorry? Oh, I would suggest that you keep me posted
8 if something were to change, in particular with any of
9 our plants or licensees, or again, if there was a
10 specific request for information, or request for
11 assistance from our Japanese counterparts.

12 MR. WEBER: Okay sir, understood.

13 CHAIRMAN JACZKO: Good. Thanks everybody.
14 Appreciate it.

15 MR. WEBER: Thank you.

16 CHAIRMAN JACZKO: Bye.

17 MR. COLLINS: Mike Weber, can you hear me?

18 MR. WEBER: I hear you.

19 MR. COLLINS: Given that we just did this
20 mini-brief for the Chairman and we probably won't have
21 to back-brief him again other than to tell him that we
22 are spinning down, do you see a need to put everybody
23 back on for one more brief to get them all up to
24 speed?

25 MR. WEBER: That's what we were just

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1 talking about, about the benefit of doing that,
2 because there have been some offices, like this last
3 call we didn't have international programs on or we
4 didn't get an update from public affairs.

5 MR. COLLINS: Right.

6 MR. WEBER: If we are going to do that we
7 were thinking it would be wise to avoid the conflict
8 with the President's presentation at 12:30.

9 MR. COLLINS: Okay, so what time do you
10 want to do this, one o'clock eastern? Is that going to
11 work?

12 MR. WEBER: I think one o'clock would work
13 from our end and that way we can also do a
14 commissioner assistance brief so that they were kept
15 up to speed on what is going on. Is that enough
16 advance notice?

17 MR. COLLINS: I (inaudible) think that
18 works for us on the bridge.

19 MR. WEBER: Okay, so we do the similar
20 format, we'd have the update on the U.S. regulator's
21 activities, then we would go to international programs
22 and then the update on communications and
23 coordination.

24 MR. COLLINS: Okay.

25 MR. WEBER: Okay. So let's shoot for one

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FJ 2450 of 2725

1 o'clock and that gives us the opportunity to watch the
2 President at 12:30.

3 MR. COLLINS: Okay. Good. Thanks much.

4 MR. WEBER: Okay, thank you.

5 MR. COLLINS: Say Troy?

6 MS. PRUETT: Yes sir.

7 MR. COLLINS: This is Elmo. I had a little
8 trouble getting on the bridge. Did I miss the brief
9 for the Chairman?

10 MS. PRUETT: Well, it was kind of a last-
11 minute kind of thing. It caught us by surprise but yes
12 you did miss it.

13 MR. COLLINS: That was a short one then,
14 huh?

15 MS. PRUETT: It was very short,
16 essentially with respect to the (inaudible)
17 facilities, the harbor buoy close to Diablo Canyon
18 registered a one-foot decrease in level and based on
19 that, Diablo doesn't expect to see anything more than
20 a three-foot rise in level at the intake structure.

21 MR. COLLINS: Okay.

22 MS. PRUETT: And I think they have
23 already seen a little bit of a rise start to occur
24 already, no more than two feet so far.

25 MR. COLLINS: They believe that's

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FJ 2451 of 2725

1 indication of the wave passing Diablo Canyon?

2 MS. PRUETT: That's right, it is -- and
3 just so you know, it's about a -- anywhere from a one-
4 to three-hour event, the tsunami is, in terms of level
5 changes. So we don't anticipate anything more than the
6 three feet, which is well within the facility design
7 basis of about 35 feet.

8 MR. COLLINS: Okay. Understood.

9 MS. PRUETT: And we have been reaching
10 out to the states and we haven't received any adverse
11 information from any of the states with respect to
12 control of licensed material.

13 MALE PARTICIPANT: Yes, we have contacted
14 about half of our cat 1, cat 2 licensees in five
15 states affected, and nothing adverse has been
16 reported.

17 MR. COLLINS: Okay, thank you.

18 MS. PRUETT: Right and then I think Bill
19 Maier -- we are getting all this into talking notes
20 right now, but -- and Linda will correct me if I am
21 wrong, but the Hawaii state EOC did go to full
22 activation --

23 MS. HOWELL: Correct.

24 MS. PRUETT: that California, with the
25 full activation at the SOC, I don't know what that

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FJ 2452 of 2725

1 stands for, I apologize.

2 MS. HOWELL: The State Operations Center
3 and the three regional operations centers.

4 MS. PRUETT: And the three regional ops
5 centers, and FEMA IX also went to full ops.

6 MR. COLLINS: Thanks. Understood. Okay.
7 Okay, well I appreciate the efforts to gather the
8 information and report out. I guess we have a number
9 of calls scheduled that --

10 MS. PRUETT: If it goes down to
11 (inaudible) there's a call scheduled for one o'clock
12 eastern time, 12 o'clock central, and we will get a
13 hold of you barring somebody jumping on (inaudible)
14 and brief you about 15 minutes before that.

15 MR. COLLINS: Well, I appreciate that, and
16 I also appreciate your flexibility.

17 MS. PRUETT: All right.

18 (Laughter)

19 MALE PARTICIPANT: And Elmo, just so you
20 know, that one o'clock will be set up as a
21 commissioner's assistants brief.

22 MR. COLLINS: So we will do that in
23 conjunction with the call that's scheduled?

24 MALE PARTICIPANT: At one o'clock eastern.

25 MALE PARTICIPANT: That's right.

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FJ 2453 of 2725

1 MR. COLLINS: Right. Very good.

2 MS. PRUETT: But Elmo, just so you know,
3 we are putting the finishing touches on a PE
4 (phonetic) and we hope to be able to get that out in
5 the not too distant future.

6 MR. COLLINS: Okay, excellent. Thank you
7 very much.

8 MS. PRUETT: All-righty. Bye.

9 MR. COLLINS: Bye.

10 (Conference call concludes at 10:30
11 a.m./05:27 a.m.)

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1 (CONFERENCE CALL INITIATED)

2 10:30 a.m./05:27 a.m.

3 CHAIRMAN JACZKO: Hey Mike?

4 (No response)

5 MR. MCDERMOTT: Brian McDermott. Mike has
6 stepped away for a minute.

7 CHAIRMAN JACZKO: Who is this? This is
8 Greg Jaczko.

9 MR. MCDERMOTT: Chairman this is Brian
10 McDermott.

11 CHAIRMAN JACZKO: Hey Brian, how are you?

12 MR. MCDERMOTT: Okay.

13 CHAIRMAN JACZKO: Hey, can we see if we
14 can track down through our interagency contacts some
15 information about a quote from the Secretary of State
16 that the U.S. Air Force has transported some really
17 important coolant to one of the nuclear plants?

18 MR. MCDERMOTT: Yes sir. We will get our
19 liaison team on that.

20 CHAIRMAN JACZKO: Okay thanks. If you
21 could just send me an email when you find out, if we
22 have any understanding what exactly that was or what
23 that meant.

24 MR. MCDERMOTT: Will do.

25 CHAIRMAN JACZKO: Okay, thanks.

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FJ 2455 of 2725

1 (Conference call concludes at 10:31
2 a.m./05:28 a.m.)
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1 (CONFERENCE CALL INITIATED)

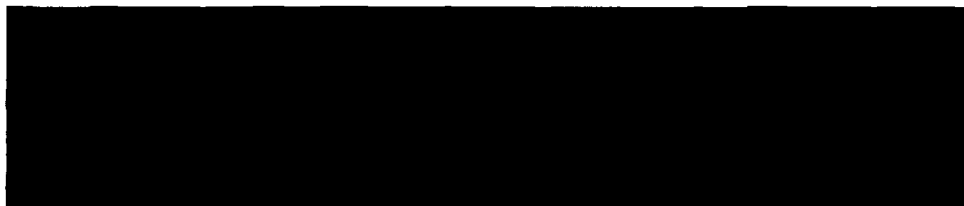
2 10:31 a.m./05:28 a.m.

3 MR. WEBER: This is Mike Weber. We
4 received a cable through international programs which
5 came from the Ambassador in Vienna, and we just want
6 to alert you to this, not that you need to do anything
7 with the information, but to make sure that you have
8 awareness of it.

9 It's a brief cable that summarizes the
10 current perspective of the International Atomic Energy
11 Agency with respect to the situation with nuclear
12 power plants in Japan.

13 And there is some somewhat alarming
14 language that talks about, and I'll just quote, "The
15 IAEA tells us the earthquake triggered a power failure
16 at the Fukushima Daiichi unit 2 nuclear power plant,
17 and then when a backup generator also failed, the
18 cooling system was unable to supply water to cool the
19 reactor.

20 "Specialists at the IAEA understand the
21 fuel core is still covered by water, but they question
22 if it will remain so." End quote.



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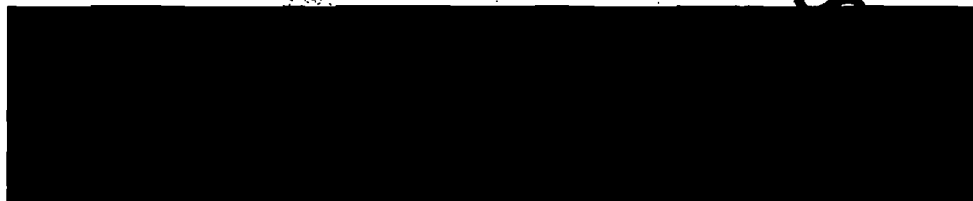
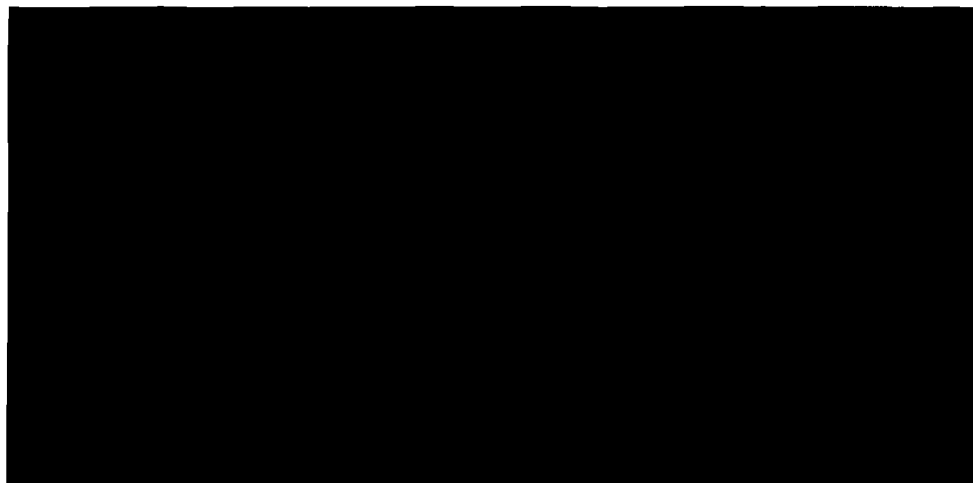
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FJ 2457 of 2725



MALE PARTICIPANT: All right thanks.

MR. WEBER: Thank you.

(Conference call concludes at 10:33

a.m./05:30 a.m.)

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FJ 2458 of 2725

1 (CONFERENCE CALL INITIATED)

2 10:37 a.m./05:34 a.m.

3 MR. MCDERMOTT: This is Brian McDermott at
4 headquarters operations center. Thank you all for
5 joining us. We have a commissioner assistants
6 briefing planned for you to provide an update on the
7 situation relative to the earthquake and tsunami
8 originated in Japan.

9 First I would like to turn it over to
10 Region IV to talk about the status of the domestic
11 situation. We will transition to Office of
12 International Programs to talk about the situation as
13 we know it in Japan.

14 Then finally we will touch on the federal
15 coordination and communication. And with that, Elmo,
16 take it for Region IV.

17 MS. PRUETT: Yes, this is Troy Pruett in
18 Region IV. I am the base team manager for the incident
19 response center, Region IV. We are going to touch on
20 the reactor plant status first. Geoff Miller will be
21 doing that. He is the branch chief for Diablo Canyon.

22 We will then run through the materials,
23 licensee status, and Chuck Cain will do that. And then
24 Linda Howell will follow up with the state
25 interactions that we have had today.

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FJ 2459 of 2725

1 So with that, Geoff, why don't you kick it
2 off.

3 MR. MILLER: Thanks. By way of a brief
4 background, at 4:23 eastern time this morning the
5 Diablo Canyon power plant declared a notice of unusual
6 event. That was based on receiving a tsunami warning
7 as a result of the earthquake experienced in Japan
8 earlier this morning.

9 At that time the licensee took the actions
10 including an evacuation of personnel from the station
11 inlet structure, which is the lowest portion of the
12 plant. They also briefed control room operators on the
13 rapid shutdown procedure and established
14 communications with the San Luis, Obispo emergency ops
15 center, and the established fire brigade and local
16 command centers.

17 Also the resident inspectors responded to
18 the site, and they are now still in the control room
19 monitoring the situation and licensee actions.

20 This morning the time the licensee
21 predicted that the maximum wave surge they expected to
22 see there at the site would be approximately three
23 feet at the intake structure. Based on this
24 information they made a determination to remain at 100
25 percent power and the station is still at 100 percent

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FJ 2460 of 2725

1 power at this time.

2 About 11:30 eastern time the licensee
3 started observing the first potential tsunami effects
4 at the site. They saw a one-foot drawdown based on
5 buoy information in the harbor.

6 They still, based on that drawdown, expect
7 about a three-foot surge, confirming their earlier
8 calculations. That surge is still in progress. They
9 have seen about a two-foot rise and expect it to reach
10 its peak here within the next hour.

11 This change is within the normal tidal
12 range of the station and they do not expect it to
13 impact plant operations. At this point they have been
14 monitoring the circulating water and seawater systems
15 and have not seen any impact on plant operation or any
16 system parameters.

17 And we are in continuous communication
18 with the residents and the control room.

19 San Onofre nuclear generating station is
20 further down the coast and the effect there is
21 expected to be less severe than at Diablo Canyon. They
22 were under a tsunami advisory and they have not
23 reached any emergency action levels, and they continue
24 -- San Onofre continues to operate at full power.

25 At this time there are about -- as I said

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FJ 2461 of 2725

1 there are no other impacts observed at the site. They
2 have evacuated all personnel from the intake structure
3 until the conclusion of the event and they are
4 discussing the criteria for unusual event termination
5 once they reach the peak here.

6 The state (phonetic) has closed their
7 normal access road to the plant and they have
8 evacuated the low-lying areas along the coast. The
9 licensee does have a north access route to the site.
10 They have driven that down. It is available, but it is
11 not yet in use.

12 They still have -- the day shift did make
13 it into the plant and took the watch but the night
14 shift is still on site. That's all for the current
15 status of Diablo Canyon.

16 MS. PRUETT: Okay. Chuck, do you want to
17 touch on the materials?

18 MR. CAIN: On the materials side, we have
19 identified that we have 17 cat 1 cat 2 licensees in
20 the states of Hawaii and Alaska. We have contacted
21 about half of those so far and none of them have
22 reported any effects from a tsunami.

23 All these licensees are (inaudible) users,
24 primarily radiographers and irradiators. There is also
25 one in our C (phonetic) licensee, cat 1 cat 2 in

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FJ 2462 of 2725

1 Sacramento, and we have yet to contact them, but we
2 will continue until we have contacted all of cat 1 cat
3 2 licensees.

4 We have also been in contact with the
5 Humboldt Bay plant which is in decommissioning in
6 northern California, and the licensee has reported
7 that they have seen no effects from the tsunami
8 effects at that location as well.

9 And then we have contacted our program
10 directors for the three agreement states --
11 California, Washington and Oregon -- and they have
12 indicated that they have they are monitoring the
13 situation in those states, and that none of their
14 licensees have yet reported any effects from tsunami.
15 I think that's it.

16 MS. PRUETT: I think that's all Region IV
17 had. Is there any questions for Region IV?

18 If not I will turn it back to
19 headquarters.

20 MR. MCDERMOTT: Okay, let's move on then
21 to international.

22 MR. MAMISH: Thanks Brian. There are 14
23 operational BWRs that are close to where the
24 earthquake took place. There are three units at
25 Onagawa, six at Fukushima Daiichi, four at Fukushima

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FJ 2463 of 2725

1 Daini and one at Tokai.

2 All three units at Onagawa were operating
3 and all were automatically shut down. Three units of
4 the six -- three of the six units at Fukushima Daiichi
5 were operating and three were in maintenance outage.
6 All three units that were operating were shut down.

7 All four units at Fukushima Daini were
8 operating and all of them were also shut down and then
9 finally, the one unit that was operating at Tokai was
10 automatically shut down.

11 So in total, 11 of the 14 units were
12 operating, and all 11 of them were shut down.

13 A fire was confirmed to have occurred in
14 the turbine building that is common to all three units
15 at Onagawa. The fire was subsequently extinguished.

16 At the Fukushima Daiichi, unit 2
17 apparently suffered a loss of feedwater to its coolant
18 system due to a lack of power.

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24 At least one (inaudible) diesel generator
25 has been delivered on site. According to some recent

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FJ 2464 of 2725

1 information that I just received from one of my staff,
2 apparently there's at least 3.4 meters of water above
3 the fuel for that unit where Fukushima Daiichi unit 2,
4 so there is still -- at this point it appears that
5 there is still plenty of water.

6 The Japanese regulatory authority has
7 declared a heightened state of alert at the Fukushima
8 Daiichi site. They have ordered precautionary
9 evacuations out to three kilometers and residents
10 between three kilometers and 10 kilometers have been
11 advised to stay home, essentially shelter in place.

12 At this point there are no reports of
13 radiation leakage that we have received officially
14 from our Japanese counterparts. CNN did report around
15 12:30 that rad levels were rising. We don't really
16 know what that means and we have not confirmed that.

17 We have no NRC staff currently in Japan on
18 official travel that we are aware of, and I believe
19 this is all the information that we have at this
20 point.

21 MR. WEBER: You may have seen -- this is
22 Mike Weber -- some press reporting quoting the
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FJ 2465 of 2725



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8 The President, when he had his briefing at
9 12:30 today was also asked the question about the
10 Secretary of State's comments. His response was when
11 he spoke to the Prime Minister this morning that he
12 offered assistance and that included offering
13 assistance for -- to the nuclear plants.

14 No request at that time was requested,
15 however the President said that he asked Secretary Chu
16 to work closely with his counterparts in Japan to
17 provide whatever assistance the United States can
18 offer.

19 And when Brian talks about coordination, I
20 think you will have more to talk about. We have
21 actually gotten a request -- the U.S. government has
22 gotten a request for assistance, not the NRC.

23 Any questions for Nader on international?

24 MALE PARTICIPANT: Yes, this is
25 (inaudible). We -- I was looking at the TEPCO website

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FJ 2466 of 2725

1 and the TEPCO website reported that at Fukushima
2 Daini, unit 1, it had a loss of coolant accident as
3 evidenced by high containment pressure.

4 Do you have any information on that?

5 MR. MAMISH: No, we do not have any
6 information on that.

7 MR. SNODDERLY: This is Mike Snodderly
8 from Commissioner Apostolakis's staff, and (inaudible)
9 the TEPCO website to be very informative. It
10 (inaudible) the problem is in unit 1 and also talked
11 about the (inaudible) that there had been actuation of
12 the emergency core cooling system due to high
13 containment pressure.

14 So we wanted to try to -- we were
15 interested in knowing if that was correct.

16 MR. MAMISH: We will follow up on that
17 statement. We are not aware of that.

18 MR. SNODDERLY: And also, Commissioner
19 Apostolakis has asked me to follow up with -- and
20 again we understand this is a very fluid situation and
21 this isn't a turnaround, but he was just curious
22 whether they had exceeded their design basis
23 earthquake, in other words whether it exceeded the
24 (inaudible).

25 MR. MAMISH: We don't have that

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FJ 2467 of 2725

1 information either, but we can certainly ask back
2 through channels.

3 MR. SNODDERLY: Thank you very much. And
4 also the TEPCO site did confirm also that there had
5 been evacuations (inaudible) three kilometers.

6 MR. MAMISH: Right. We did get that
7 information.

8 MALE PARTICIPANT: Any other international
9 activity -- we are coordinating with the IAEA. The
10 IAEA sent out a cable that came out on -- well, not
11 the IAEA but Ambassador Davies sent out a cable that
12 talked about the status of the IAEA with respect to
13 response to the Japanese earthquake, and so we are
14 continuing to coordinate with our folks in Vienna and
15 with the IAEA.

16 MS. HOWELL: Mike, can I get some
17 clarification that you said that the federal
18 government had received a request from Japan for
19 assistance but we, the NRC, had not. Is that correct?

20 MR. MCDERMOTT: This is Brian McDermott.
21 Actually, the request Mike was referencing is we have
22 an unconfirmed at this point report that the Japanese
23 ambassador has requested support from the Navy,
24 specifically the USS Ronald Reagan, but that is as
25 much as we have heard about that request.

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1 The DHS National Operations Center was
2 activating what is called its crisis action team, and
3 that is a -- there's a standing body but then there is
4 also an expanded complement which includes actually
5 some NRC staff who will provide support.

6 They did not go into that expanded
7 activation of that group, and in fact we hear that
8 they are looking at standing down if things in the
9 U.S. continue to go as it appears at this point in
10 time.

11 And that is what we have for federal
12 coordination. We do have portions of a liaison team at
13 the headquarters operations center. They are working
14 with Region IV and then coordinating with our federal
15 partners, including the FEMA REPP, radiological
16 emergency preparedness program folks as well.

17 That's what we had for federal
18 coordination. Any questions on that before we ask for
19 an update from public affairs?

20 MALE PARTICIPANT: Brian, (inaudible)

21 MALE PARTICIPANT: It will go to the
22 national response coordination center.

23 MR. MCDERMOTT: That's FEMA's basically
24 main ops center. That's where all the real direction
25 if you will, to move assets, to tap departments and

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1 MS. HOWELL: Okay. That's helpful. Thank
2 you.

3 MR. MCDERMOTT: What I can tell you about
4 the rest of the federal government, I think
5 Administrator Fugate at FEMA was definitely wanting to
6 have FEMA stood up and ready for any impact on the
7 United States.

8 Earlier today they had activated the two
9 FEMA regional response coordination centers that would
10 deal with the west coast in the potential area of
11 impact and staffed those facilities.

12 They also fully staffed the National
13 Response Coordination Center, which includes support
14 for the 15 emergency support functions that represent
15 different sectors of our economy and response.

16 We are in the process of sending a liaison
17 down to the NRCT and we may gain some insights about
18 what is being requested of the federal government
19 through that channel.

20 But by protocol, official requests for
21 U.S. support should be coming in through the State
22 Department, and we would be hearing about it through
23 that channel. We are monitoring that, but at this time
24 we have no requests for technical assistance from the
25 NRC.

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FJ 2470 of 2725

1 agencies to provide support, is funneled through that
2 center. Is there a question on the line for
3 coordination?

4 TAD: This is Tad Kappelman (phonetic).
5 I'd like to get back to the previous topic. As I
6 understand it, (inaudible) that are in question, they
7 are all at Fukushima Daiichi. The Fukushima Daiichi
8 reactors, there are four of them there those are
9 fine, right?

10 MR. MAMISH: That's correct. But they are
11 also shut down, as far as we know.

12 TAD: Right. You all briefed about the
13 loss of feedwater. That was at unit 2.

14 MR. MAMISH: Correct.

15 TAD: Okay, now we have been getting --
16 some of us have been getting emails that OIP is
17 forwarding and the latest one talks about unit 1 at
18 that site having rising radiation levels and rising
19 containment pressure.

20 MR. MAMISH: I'm sorry, who are you
21 getting that from Tad?

22 TAD: Darren Saskowitch (phonetic).

23 MALE PARTICIPANT: We do have some
24 different reports and one thing to be cognizant of is
25 that there are two stations, so you will see things

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1 labeled as Fukushima 1, but that could refer to the
2 first station. It could be Daiichi instead of Daini.

3 And so there's a -- as we understand it
4 from the cable, the cable that came from the
5 ambassador, it's Fukushima one dash two, so that would
6 be Fukushima Daiichi, unit 2.

7 MALE PARTICIPANT: But that's the one that
8 has the loss of feed.

9 MALE PARTICIPANT: Right.

10 TAD or PAT: What's going on at Fukushima
11 Daiichi unit 1?

12 MALE PARTICIPANT: That's what we have to
13 track back Tad (or Pat, phonetic), we don't know.

14 PAT: Right because we are getting the
15 indications that information that EDCTS (phonetic)
16 automatically started up and we have a reactor --
17 rising radiation levels at that unit, so it sounds to
18 me like at Fukushima Daiichi, there may be problems at
19 two units.

20 MR. MAMISH: I think that there is a
21 little bit of a translation -- we will go back and
22 chase it. But Daiichi in Japanese means one.

23 TAD: Correct. (Inaudible) Fukushima site
24 and then there is Fukushima Daini, because the
25 (inaudible) that's how you count in Japanese. That's

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1 about all I know. (Inaudible) if you could make sure
2 that everything is clear because (inaudible).

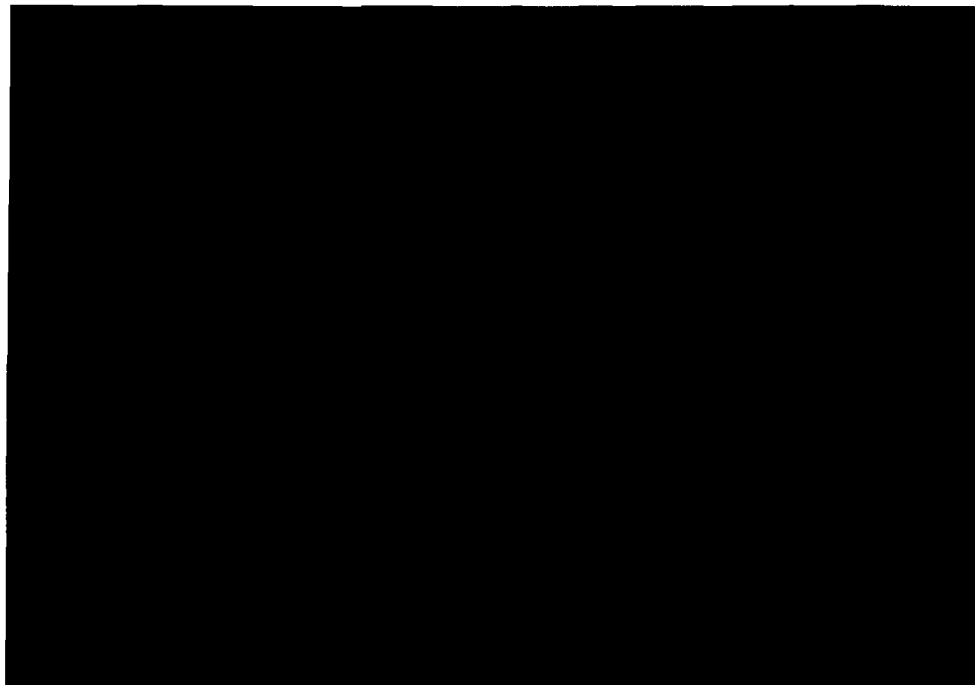
3 The next question I have is regarding that
4 emergency (inaudible) emergency diesel. Has that been
5 hooked up and is that providing power?

6 MR. MAMISH: We don't know.

7 PAT: Okay. Thank you.

8 MS. TADESSE: Rebecca Tadesse from
9 Commissioner Magwood's office. Commissioner Magwood
10 wanted to know or get confirmation that (inaudible)
11 email, it says that the Air Force has delivered
12 coolant to the Fukushima number one plant. Is that
13 correct?

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MALE PARTICIPANT: He said it.

MR. BRENNER: And I will report back throughout the system here on whatever I find out. Now, I'll stay out of the way until it's time for me to tell what we are doing.

MALE PARTICIPANT: You're up.

MR. BRENNER: I'm up. Okay. You have seen what we have done. One press release. Some talking points. Going forward, it's my intention as we ramp down in Region IV to do another press release that sort of walks back from that particular position and shifts the focus to NRC leaders are meeting to determine what can -- how to respond, that we have not received a specific request for assistance but we would be prepared to do so.

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1 I am absolutely (inaudible) by requests
2 for people to go on television, which we are not at
3 the moment entertaining. It may be something we deal
4 with a little down the road. I'm pawning some of this
5 off to ANS (phonetic) and NAI (phonetic).

6 We have heard from every news agency under
7 the sun and then some. We have posted (inaudible) blog
8 and we will post a second one later.

9 As I circulate or as CPA circulates
10 talking points, (inaudible) two things. One, I would
11 appreciate it if these did not leave the building, and
12 two, that if anybody receives requests for interviews,
13 that you funnel them through public affairs.

14 And that's it in a nutshell.

15 MR. WEBER: Any questions for Eliot on
16 public communications?

17 MIKE: Mike, this is Mike Kranowitch.
18 (Phonetic). I just want to go back to where Pat was
19 before, quickly because we seem to be -- I don't think
20 quite closed that out yet.

21 MR. WEBER: No we have not. We have to ask
22 those questions and get the official word back through
23 channels.

24 MIKE: Absolutely, and what I would like
25 to know, and to get at it is, our Japanese

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1 counterparts that are either here or that there is any
2 contact with, do we know whether any cooling is going
3 on for the unit that is in trouble at Fukushima,
4 whichever unit that may be?

5 MR. WEBER: You were breaking up Mike. Can
6 you ask that again?

7 MIKE: From our counterparts, Japanese
8 counterparts that are either here or we are in contact
9 with, do we have any confirmation that there's cooling
10 going on to the unit that is in trouble at Fukushima,
11 any kind of --

12 MR. MAMISH: No, we do not (inaudible)
13 here in the ops center earlier, the (inaudible) and
14 the information that was passed on earlier is the
15 information that was -- that we heard from our
16 Japanese counterparts.

17 MR. WEBER: But the information was
18 preliminary, and the individual who we spoke with was
19 also going off to confirm the information because the
20 reporting that they were getting over here was very
21 spotty from their counterparts.

22 MIKE: Okay.

23 MR. WEBER: They did tell us that they are
24 staffing up for a next shift, and certainly from the
25 seriousness with which we were communicating, it was

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FJ 2476 of 2725

1 evident that they were concerned and were taking
2 proper steps to make certain that they maintained
3 control of the plant.

4 MIKE: Okay. Fair enough. We will wait.

5 MR. WEBER: Okay. Any other questions on
6 public communications?

7 MALE PARTICIPANT: No.

8 MR. WEBER: Okay, well just to remind
9 everybody that you know, in an event like this we are
10 going to get a lot of preliminary information.
11 (Inaudible) these emails. We are continuing to monitor
12 that but at the same time we are trying to get some
13 confirmation on the information as it stands, without
14 being obtrusive to the Japanese regulator, who is
15 fully in charge of this event.

16 FEMALE PARTICIPANT: Is there going to be
17 (inaudible)?

18 MR. WEBER: Yes, I think what we would
19 probably do is wait until we get some more information
20 that we can provide you a meaningful update and then
21 we will schedule another call.

22 FEMALE PARTICIPANT: Thank you.

23 MR. WEBER: Any other questions?

24 CHARLIE: Hey Mike, it's Charlie. When
25 Chuck did his briefing, he didn't mention some of the

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1 U.S. possessions, like American Samoa or Guam or
2 Marshall Islands, and I know we have some licensees
3 there.

4 I am not sure if there's any category 1 or
5 2.

6 MR. CAIN: This is Chuck Cain. We do not
7 have any cat 1 or cat 2 licensees in these
8 possessions.

9 CHARLIE: Okay.

10 MR. CAIN: And we do have reports of very
11 little effect if (inaudible, probably "any") in terms
12 of tsunami effects.

13 CHARLIE: Thanks Chuck.

14 MR. WEBER: Okay, if that's it, thank you
15 everyone for doing the call. Headquarters, we are
16 going to separate the bridge now. Thank you.

17 Conference call concludes at 11:02
18 a.m./05:59 a.m.)

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1 (CONFERENCE CALL INITIATED)

2 11:03 a.m./06:00 a.m.

3 MR. COLLINS: Hey Mike, I am just
4 thinking, it might be a good time for us to revisit
5 how we have shaped our response to this event. We are
6 envisioning Region IV licensees and U.S. licensees, no
7 effect from the tsunami.

8 But it sounds like, Mike, as best I can
9 tell from the limited information we have, there's
10 going to be a continuing issue associated with the
11 reactor in Japan, that it looks like, until we hear
12 otherwise, could be in real trouble.

13 MR. WEBER: That's consistent with what we
14 are hearing here Elm.

15 MR. COLLINS: Yes, so I would offer that
16 in terms of agency response mode, that we continue
17 with monitoring, but the focus is going to be -- the
18 need is going to arise from our ability to capture,
19 consolidate and disseminate information associated
20 with the status of the reactor in Japan, and then what
21 communication or assistance or whatever it is we need
22 to provide from an agency perspective, and
23 communication from an agency perspective.

24 MR. WEBER: Right. So you are thinking
25 Region IV would pull out and headquarters would retain

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1 the lead then for the international coordination,
2 communication and coordination function?

3 MR. COLLINS: Yes, that's a little unusual
4 since in monitoring mode, we typically -- it's driven
5 by an event at a U.S. licensee, one of our licensees.
6 So regions take the lead, always have had the lead --
7 take the lead if we are in the monitoring mode if we
8 don't have a need, we get out of the monitoring mode.

9 I'm just envisioning this looking a little
10 different. The problem, we still need to retain a
11 capability to assess and disseminate information or
12 even (inaudible) support as needed.

13 But it's not going to be a U.S. licensee
14 focus.

15 MR. WEBER: Right. And I think we have
16 done that in the past, and our procedures provide the
17 flexibility that NRC would be led in monitoring by
18 headquarters for this kind of an event.

19 MR. COLLINS: Yes, okay. Good.

20 MR. WEBER: So when do you anticipate
21 (inaudible) shutting down?

22 MR. COLLINS: Well, I'm not so much a --
23 leaving it at that or just -- I'm not sure that we
24 can't provide some element of assistance to you. What
25 we might need to retain, if anything, we would go back

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FJ 2480 of 2725

1 to a very low level of engagement, but we can
2 actually, if needed, keep our incident response
3 center.

4 I'm not sure what role we would perform.
5 If I'm just thinking Diablo Canyon, and any U.S.
6 licensees, it's evident they are going to be secure
7 from the unusual event. There's not going to be any
8 impact.

9 And that would typically be our decision
10 point to secure for monitoring mode.

11 MR. WEBER: Yes.

12 MR. COLLINS: I think we would have a
13 modified decision here that we are -- I don't know if
14 we are there or we might be, at any rate, we are very
15 close to saying we don't need active monitoring from
16 the Region incident response center. But it's the
17 transfer of the lead for the activities and monitoring
18 at the headquarters.

19 MR. WEBER: I see a lot of heads shaking
20 on the affirmative back here, Elmo.

21 MR. COLLINS: Okay.

22 MR. WEBER: Okay.

23 MR. COLLINS: We can get back to you and
24 we got a little time to let it play out a little bit
25 longer. But I am expecting within an hour or two we

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FJ 2481 of 2725

1 are going to hear something that is going to say we
2 don't actually have an active role for U.S. licensees.

3 MR. WEBER: Right. Sounds fine from here.

4 MR. COLLINS: Okay?

5 MR. WEBER: Thanks for all your help.

6 MR. COLLINS: Okay. We'll -- we'll keep
7 the bridge open and we will be in contact.

8 MR. WEBER: Okay, thanks.

9 MR. COLLINS: Just one other thought Mike.

10 MR. WEBER: Go ahead Elmo.

11 MR. COLLINS: Unless we get some really
12 good information that the (inaudible) reactor is not
13 in trouble, at some point we are going to need a
14 pretty wide-based briefing which would include Eric
15 and the regional administrator, I'm envisioning.

16 MR. WEBER: Right. So I think when we find
17 out something substantial then we committed to have
18 subsequent commissioner assistants briefs and they
19 would certainly include Eric and other office
20 directors and OCA, OPA, right? Is that what you had in
21 mind?

22 MR. COLLINS: Yes. Yes. I'm just -- it's
23 been a -- I can't eliminate that this is actually a
24 severe (phonetic) action and we obviously haven't had
25 one of those in a long time.

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FJ 2482 of 2725

1 MR. WEBER: I share your concern.

2 MR. COLLINS: Okay. I am going to sign off
3 and be in touch via Region IV (inaudible). We will be
4 communicating back as we think our role is needed and
5 what our recommendations are.

6 MR. WEBER: Okay. Sounds good Elmo. Thank
7 you.

8 MR. COLLINS: All right. Thank you Troy,
9 can you give me a call separately?

10 MS. PRUETT: I'll do it right now.

11 MR. COLLINS: Thank you very much.

12 (Conference call concludes at 11:09
13 a.m./06:06 a.m.)
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FJ 2483 of 2725

1 (CONFERENCE CALL INITIATED)

2 11:09 a.m./06:06 a.m.

3 MR. MCGINTY: Josh, are you on the bridge?

4 JOSH: Yes, I'm here.

5 MR. MCGINTY: How can we help you?

6 JOSH: Well, I didn't want to interrupt. I

7 just had a couple of messages from the Chairman.

8 MR. MCGINTY: Okay.

9 JOSH: Do you want me to go

10 MR. MCGINTY: Go ahead.

11 JOSH: Okay. The Chairman just, well a
12 couple of minutes ago, spoke with Secretary Chu. They
13 are engaged, as you saw the President mention in his
14 press conference.

15 The Chairman has forwarded the excellent
16 fact sheet that the staff there put together to the
17 Secretary, and the Secretary asked to keep that -- at
18 the staff level we keep Dr. Lyons in the loop --

19 MR. MCGINTY: Okay.

20 JOSH: on the information that we have and
21 that we know. So if we could please, going forward, as
22 we update the information that we have in that very
23 good fact sheet, if we could provide that to Dr. Lyons
24 and as well as our normal contacts with DOE.

25 The Secretary will probably be out

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1 speaking about this. He is going to say that we have,
2 you know, coordination with (inaudible) and
3 (inaudible)

4 MR. MCGINTY: Josh, are you still there?

5 JOSH: Yes, still here. Did you hear that
6 part? Okay. The Secretary will be saying they are in
7 coordination with us as he goes about saying things

8 The two specific things that he had -- I
9 don't know how often we plan to update that fact
10 sheet, but if we could use that as our primary
11 communications vehicle. I don't know if there's any IP
12 (phonetic) folks in there, but maybe the emails going
13 around from Clarence, maybe we could sort of stop
14 those, now that we have a better communication vehicle
15 that has what we know as a regulator and from our
16 contacts and from our information.

17 So is that something you could convey to
18 IP or should --

19 MR. MCGINTY: We will -- I will discuss
20 that with Nader.

21 JOSH: Okay. So if we could hold off on
22 those and replace them with these very good fact sheet
23 information that we have, updated as often as needed,
24 and if Congressional Affairs could fill -- if you guys
25 are comfortable with Congressional Affairs, can get

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1 those to the Hill as well, as what we know.

2 MR. MCGINTY: Okay.

3 JOSH: And then I will follow up with
4 Eliot. I think (inaudible) and build it in the room,
5 but just to make sure we are in coordination with DOE
6 on what the messaging is.

7 MR. MCGINTY: Okay.

8 JOSH: And I think that was it. Does that
9 make sense? Any questions on those?

10 MR. MCGINTY: Makes sense from our
11 perspective.

12 JOSH: Great. Okay. Sorry to butt in.
13 Thank you.

14 MR. MCGINTY: Just so you are aware Josh,
15 one of the things we talked to Elmo about is the
16 danger zone has passed for the U.S. facilities and
17 material. It's likely that Region IV will stand down
18 from their role in leading the response to the U.S. --
19 for the U.S. plants.

20 JOSH: Got it.

21 MR. MCGINTY: And headquarters will remain
22 in the lead then for monitoring because of the
23 international communication and coordination function.

24 JOSH: Okay.

25 MR. MCGINTY: Okay?

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1 MR. MCGINTY: Okay. Well, there seemed to
2 be some frustration on the part of some of the
3 commissioner offices that we don't know more about
4 what is going on at the Japanese facilities.



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11 JOSH: Okay. I will circle back with my
12 colleagues back here and, you know, I think the
13 Chairman's direction was that we not overly interfere
14 with their activities, so I will make sure they get
15 that understanding as well, that we know what we know
16 but we are not going to -- the most important thing
17 for the Japanese nuclear plants right now is not
18 making sure the NRC knows what is going inside them.
19 It's for them to be able to address the challenges
20 that they are facing.

21 So I will convey that message more clearly
22 to my friends up here as well.

23 MR. MCGINTY: And for us to provide
24 whatever assistance they may need.

25 JOSH: Exactly. Exactly. Okay. Great.

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1 JOSH: So we would technically stay in
2 monitoring mode, or Region IV would exit?

3 MR. MCGINTY: When we make a response mode
4 change, we make that as an agency.

5 JOSH: Okay.

6 MR. MCGINTY: So, when we went into
7 monitoring this morning the NRC was in monitoring.

8 JOSH: Right.

9 MR. MCGINTY: Normally, it's the region
10 that leads in monitoring because we are responding to
11 an event at a specific plant or involving specific
12 materials. But we do have the flexibility under our
13 procedures to have a headquarters lead in monitoring,
14 because of situations like this, where the threat is
15 really not to a specific facility but it's something where
16 we as an agency are responding, communicating,
17 coordinating.

18 JOSH: Okay. So that would be consistent
19 with our procedures to remain in that status.

20 MR. MCGINTY: Right.

21 JOSH: Okay. I will pass that on Tim.

22 MR. MCGINTY: Okay. And were you on the
23 commissioner assistants brief?

24 JOSH: No, I had left towards the
25 beginning of it to come back over.

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1 MR. MCGINTY: There is increasing
2 reporting on the news about the nuclear plant
3 emergency, small radiation leak possible, CNN.

4 JOSH: Yes, okay. And have we gotten the
5 fact sheet to them as well, to the commissioner
6 offices as well?

7 MALE PARTICIPANT: We'll get it to them.

8 JOSH: That might help a little bit too.
9 I'll let them know that you guys are going to send
10 them that as well. Okay great.

11 MALE PARTICIPANT: All right thanks.

12 JOSH: Thank you very much. Appreciate it.

13 MALE PARTICIPANT: Righto.

14 JOSH: Bye.

15 MALE PARTICIPANT: Bye-bye.

16 Conference call concludes at 11:15
17 a.m./06:12 a.m.)

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FJ 2489 of 2725

1 (CONFERENCE CALL INITIATED)

2 11:15 a.m./06:12 a.m.

3 CHARLIE: Just got off the phone with Elmo
4 and they would like to have another ET level call at
5 1:30 central, 2:30 eastern. The purpose of that call
6 would be to talk about -- for simply shutting down and
7 headquarters taking the lead for monitoring, and in
8 the meantime, between now and then, Linda and her
9 staff would get with your staff and work out the
10 details behind the scenes as to what that -- what that
11 transition looks like and what actions that we might
12 transfer over to your guys

13 MR. McDERMOTT: Charlie, this is Brian
14 McDermott, I think that sounds reasonable. One thing
15 that, I don't know if you heard some of the other
16 conversations that were going on on this bridge with
17 the Chairman's staff, but they are encouraging us to
18 share our situation report with various entities and
19 we have primarily had that as an internal document at
20 this point in time.

21 The last version of that, from 1300
22 eastern time kind of wrote through what we thought was
23 going to happen, which we now know was the case, there
24 were no major impacts.

25 But we could probably use some help

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1 forwarding that for the situation as it is today,
2 recognizing that we only want to provide a high level
3 summary of U.S. facilities and that we have closely
4 monitored and that there has been no impact.

5 I think that would be helpful to have you
6 guys with the first-hand knowledge part of that
7 process.

8 MS. HOWELL: Sure, we can do that, Brian.
9 What time is your next update?

10 MR. MCDERMOTT: We haven't scheduled it
11 yet.

12 MS. HOWELL: Okay, were they working -- I
13 was improvising (inaudible) on FEMA, are they working
14 from that one that, ~~said~~ you know, Region IV facility
15 status, is that what they were using?

16 MR. MCDERMOTT: They used it as input and
17 then they merged it with input from international
18 programs and also the staff here.

19 MS. HOWELL: Okay. I'll give them another
20 update here in a little bit.

21 MALE PARTICIPANT: Yes, okay, I see what
22 it is Linda, it looks like yes, the status of NRC
23 agreement state facilities Region IV update current as
24 of 12:40 eastern standard time.

25 MS. HOWELL: Yes.

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1 MALE PARTICIPANT: Yes. So that piece, if
2 we could just kind of keep in mind the new audience,
3 the new broader audience to include Dr. Lyons over at
4 DOE, perhaps the Hill.

5 MS. HOWELL: Okay, got it. I will rework
6 it and forward a version on in a little bit to liaison
7 staff. I'll probably give a little bit of time just to
8 see if the (inaudible) clears their (inaudible), and
9 Brian, I'll give you a call separately to kind of
10 review how we move on forward, okay.

11 MALE PARTICIPANT: Okay.

12 MS. HOWELL: If that's all right with you.

13 MALE PARTICIPANT: But do you want to do
14 that with Tim McGinty and the liaison team?

15 MS. HOWELL: I can certainly do that.
16 There's an element -- site element to it which is why
17 I was going to suggest Brian, but I can do it both.

18 MALE PARTICIPANT: Okay. We have got Jane
19 Marshall here. Do you want to talk to her about that
20 aspect?

21 MS. HOWELL: Yes.

22 MALE PARTICIPANT: Thanks. Okay Troy?

23 MS. PRUETT: That sounds good to me.

24 MALE PARTICIPANT: All right.

25 MS. PRUETT: Thanks.

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1 MALE PARTICIPANT: Thank you.

2 (Conference call concludes at 11:18

3 a.m./06:15 a.m.)
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1 (CONFERENCE CALL INITIATED)

2 11:19 a.m./06:16 a.m.

3 MALE PARTICIPANT: We have got Tim McGinty
4 on behalf of the liaison team to give us an update.

5 MR. MCGINTY: Yes. (Inaudible) the
6 commissioners assistants brief the liaison came with
7 the action items that we are pursuing.



14 So they are continuing on our behalf in
15 that regard. They understand how important that
16 (inaudible)

17 Secondly, I also took the action item to
18 determine whether any of the Japanese plants exceeded
19 their design basis earthquake value. That was
20 Commissioner Apostolakis and also a recognition that
21 (inaudible) so we will do our best to determine that
22 over the longer term.

23 MALE PARTICIPANT: Without distracting the
24 Japanese counterpart.

25 MR. MCGINTY: That is correct. And the

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1 third item was to request information regarding
2 Fukushima Daiichi unit 1 with respect to internet
3 reports or website reports (inaudible) containment
4 pressure, that we are trying through the international
5 counterpart, trying to get information (inaudible)
6 that.

7 I do have a request from Health and Human
8 Services that has come into the operations center,
9 requesting information with respect to the
10 tsunami/earthquake, if possible, would like our
11 response (inaudible) 1500 eastern standard time.

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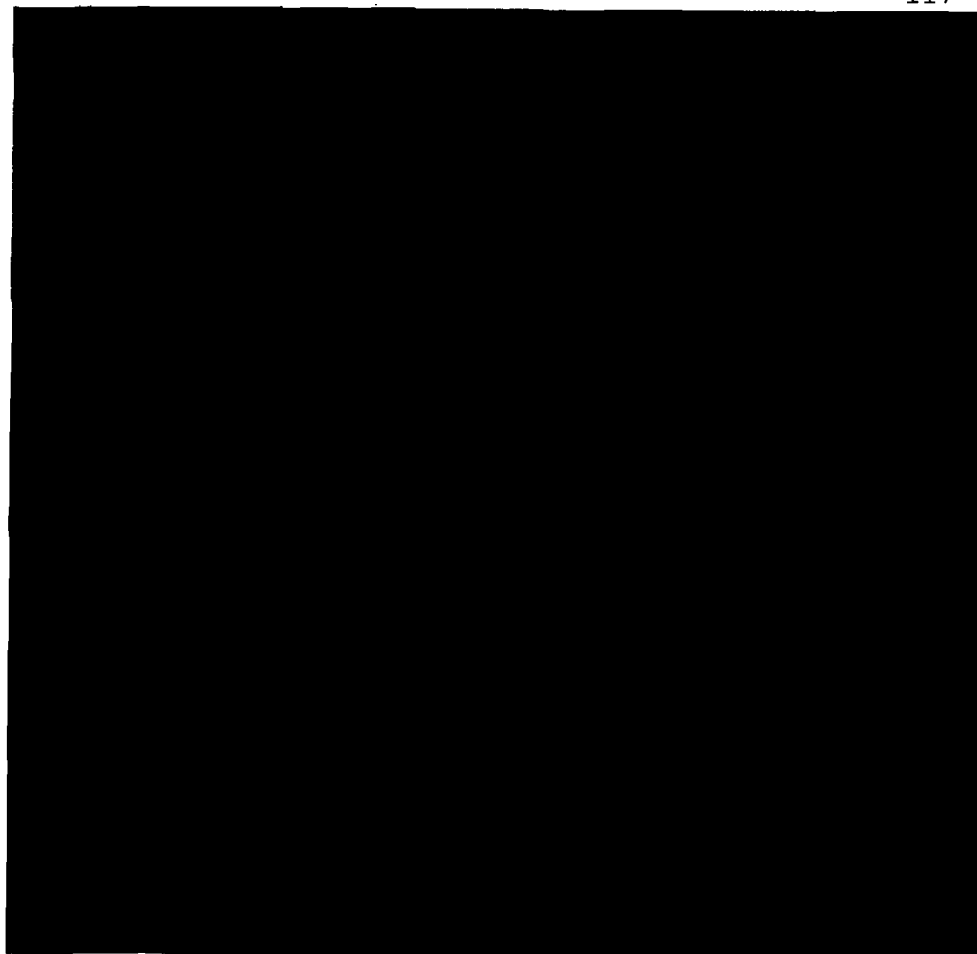
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MALE PARTICIPANT: I think we are over-
thinking the question. Have you got Trish Milligan? If
she can participate in the 3 o'clock call?

MALE PARTICIPANT: Okay.

(Inaudible, multiple speakers)

MALE PARTICIPANT: She is the back
channel, they were checking through that. We have got
Region IV on it.

MALE PARTICIPANT: And it's a hypothetical
as far as I am figuring out.

MALE PARTICIPANT: Okay. So we will reach

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1 out to Trish Milligan and confirm. I am also going to
2 get back to HHS and try to seek clarification on what
3 (inaudible).

4 MALE PARTICIPANT: Let Trish speak to --

5 MALE PARTICIPANT: Okay.

6 MALE PARTICIPANT: Yes, that would be my
7 suggestion. You have enough to do.

8 MALE PARTICIPANT: How did Trish get hold
9 of (inaudible)?

10 MALE PARTICIPANT: She just called Brian,
11 who handed the cell phone to (inaudible), somebody
12 from HHS that she worked with on KI.

13 MALE PARTICIPANT: Right. Any other news
14 from Region IV?

15 MALE PARTICIPANT: No other news. We did
16 have this TESCO press release, which goes down for
17 each of the plants, Fukushima Daiichi and Fukushima
18 Daini, and it does indicate some level of concern with
19 both units 1 and 2.

20 Unit 3 appears okay, 4 okay, 5 okay, 6
21 okay. So if you haven't seen it --

22 MALE PARTICIPANT: I have not seen it. I
23 will make a copy of that.

24 MALE PARTICIPANT: Because that would
25 answer part of your question as you are trying to

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1 track down what is the status of (inaudible) one.

2 (Multiple speakers)

3 MALE PARTICIPANT: And we may get more in
4 from our Japanese (inaudible).

5 MALE PARTICIPANT: (Inaudible) safety
6 team, I did get a copy of a tabulated information that
7 I have on (inaudible) QA (inaudible) but it's not --

8 MALE PARTICIPANT: Oh, beautiful. This is
9 what I recall.

10 MALE PARTICIPANT: Okay.

11 MALE PARTICIPANT: We have one of those
12 for every plant in the country --

13 (Inaudible, multiple speakers)

14 MALE PARTICIPANT: that level of detail.
15 These are all the Region IV plants.

16 MALE PARTICIPANT: The Chairman wants it
17 available today. I would say the thing to do would be
18 to -- I don't know if (inaudible) for every plant in
19 the country but I can't rule it out either.

20 MALE PARTICIPANT: Just get it for Region
21 IV plants, and then if they want it for the other
22 plants ==

23 (Inaudible, multiple speakers)

24 MALE PARTICIPANT: I'll put these
25 (inaudible) and I'll make multiple copies. You want

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1 electronic do you think?

2 MALE PARTICIPANT: I would say that we
3 would want to ship it electronically to Josh.

4 MALE PARTICIPANT: All right.

5 MALE PARTICIPANT: And we would also give
6 it to Eliot and Bett Hayden (phonetic), Holly
7 Harrington.

8 MALE PARTICIPANT: Okay.

9 MALE PARTICIPANT: And is this OUO
10 (phonetic) information?

11 MALE PARTICIPANT: I guess we would call
12 this OUO. It's --

13 MALE PARTICIPANT: (Inaudible) SAR
14 (phonetic)?

15 MALE PARTICIPANT: These are out of their
16 emergency plans.

17 (Inaudible, multiple speakers)

18 MALE PARTICIPANT: -- make sure we are
19 protecting it --

20 (Inaudible, multiple speakers)

21 MALE PARTICIPANT: Understand, thank you
22 sir.

23 (Laughter)

24 MALE PARTICIPANT: Whatever you just said.

25 MALE PARTICIPANT: Well, if it's

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1 sensitive, we need to protect it --

2 MALE PARTICIPANT: I'll mark it OUO.

3 MALE PARTICIPANT: He was looking for you,
4 looking for Jack, (inaudible).

5 MALE PARTICIPANT: That's probably the
6 most expedient information I got.

7 (Inaudible, multiple speakers)

8 MALE PARTICIPANT: Information relative to
9 technical specifications or FSARs (phonetic) that are
10 referenced there (inaudible, multiple speakers)
11 there's a reference to a license (inaudible, multiple
12 speakers).

13 MALE PARTICIPANT: -- tsunami and more
14 information about the flooding. We can limit it to
15 that, but it's going to take a little more time.

16 (Inaudible, multiple speakers)

17 MALE PARTICIPANT: I think the question,
18 do we know what the origin (inaudible). If it is
19 sensitive then we need to protect it. If not --

20 MALE PARTICIPANT: I don't have the
21 (inaudible)

22 MALE PARTICIPANT: Who pulled it together?

23 MALE PARTICIPANT: This was pulled
24 together actually by the region as part of our
25 phenomenal (inaudible, multiple speakers)

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1 MALE PARTICIPANT: Troy, are you familiar
2 with -- hey, can we keep it down? Are you familiar
3 with the information that Rick is talking about?

4 (No response)

5 MALE PARTICIPANT: Region IV, are you
6 still there?

7 MS. PRUETT: Yes, go ahead.

8 MIKE: Sorry, I don't know if you were
9 listening in on the conversation, but we were asked by
10 the Chairman to provide information today with respect
11 to the design basis of the nuclear power plants so
12 that it could be used as a resource to answer
13 anticipated questions that may come from the media or
14 other sources over the weekend.

15 MS. PRUETT: Yes, so are you talking
16 tsunami or earthquake?

17 MIKE: Both.

18 MS. PRUETT: Okay, yes, we talked about
19 the tsunami a lot, but based on the information we
20 pulled up, it looked like this earthquake in Japan was
21 a 0.26 G and so in Diablo terms, their operating base
22 earthquake is 0.2, so they would have exceeded that at
23 about the plant's -- their double design earthquake,
24 which is -- safety grade system is 0.4, so they were
25 under that, this earthquake was.

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1 And then they also have an (inaudible)
2 earthquake limit, which is up in the 0.6 range, so
3 this earthquake was below that (inaudible).

4 MS. PRUETT: Mike, to answer your
5 question, we can pull some of that together, some of
6 the --

7 MIKE: Yes, I'm not asking you to do that.
8 I think we already have that information. It's in a
9 table that Rick recalls the region pulled together.

10 MS. PRUETT: Oh yes, we have those for
11 every plant.

12 MIKE: It was called the licensee natural
13 phenomena response requirements.

14 MS. PRUETT: Yes.

15 MIKE: The question is, is that sensitive
16 information or is that publicly available
17 information.

18 MS. PRUETT: That's publicly available.

19 MIKE: Okay.

20 MS. PRUETT: That data is from the
21 (inaudible) It has been talked about in a number of
22 public meetings associated with the shoreline
23 (inaudible) analysis, the new earthquake (inaudible).

24 MIKE: That's the answer we needed. Thank
25 you very much. Okay, we are going to put you on mute

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1 here.

2 (Conference call concludes at 11:30
3 a.m./06:27 a.m.)
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1 (CONFERENCE CALL INITIATED)

2 11:31 a.m./06:28 a.m.

3 MR. COLLINS: Region IV, this is Elmo
4 Collins. Are you on the bridge?

5 MALE PARTICIPANT: We are here.

6 MALE PARTICIPANT: I don't know if
7 headquarters is back. There was a 15-minute delay.

8 MR. COLLINS: Yes, I guess they are
9 gathering -- I understand, some information from the
10 international community, so I am ready when the right
11 time comes. So is there anything else we need to
12 discuss before we just wait for the call?

13 MALE PARTICIPANT: They were experiencing
14 quite a bit of wave action along the coastline near
15 Diablo Canyon and because of that, they -- initially
16 they were thinking they would back out of the tsunami
17 warning in about 10 minutes, but they are not going to
18 do that. It looks like they are going to leave it in
19 place until at least midnight Pacific time.

20 MR. COLLINS: Can you describe what wave
21 action you are referring to?

22 MALE PARTICIPANT: Well, it was in the
23 coastal harbor areas, it was enough to capsize some
24 boats that were in the harbor or pull them up off
25 their moorings or have them break free of their

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FJ 2506 of 2725

1 moorings and things of that kind -- but --

2 FEMALE PARTICIPANT: That was at Morrow
3 Bay.

4 MALE PARTICIPANT: At Morrow Bay.

5 MALE PARTICIPANT: And Santa Cruz.

6 MALE PARTICIPANT: Santa Cruz, but there's
7 no impact at Diablo Canyon.

8 MR. COLLINS: Okay. And the buoy at Diablo
9 Canyon? We still getting data from that?

10 MALE PARTICIPANT: Yes, they showed me a
11 plot a while back. It wasn't -- the wave height
12 changes were not that significant but let me see if
13 Geoff has a current perspective on that. Here he
14 comes.

15 Geoff that harbor buoy that we were
16 getting the outsurge and the insurge on, what is that
17 showing?

18 MR. MILLER: They are still there at the
19 site, and it's been more of that three feet (phonetic)
20 that we have been recording that. We haven't seen any
21 of the additional waves that they said they heard at
22 Santa Cruz and Morrow Bay.

23 MALE PARTICIPANT: Okay.

24 MR. MILLER: They are evaluating right now
25 whether they need to pull people from the intake

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1 structure again.

2 MALE PARTICIPANT: Did you hear that Elmo?

3 MR. COLLINS: I didn't catch that last
4 part again Geoff. Would you say that again?

5 MR. MILLER: That part, they had
6 previously withdrawn all personnel from the intake
7 structure and after it appeared that the worst of it
8 had passed they restaffed and returned the security
9 personnel and operators to the intake structure, and
10 they are looking now, based on the new information of
11 the higher waves at Santa Cruz and at Morrow Bay,
12 whether they need to pull them back again.

13 MR. COLLINS: Okay, interesting. I guess
14 experts tell us this could go on for an hour or two or
15 three.

16 MALE PARTICIPANT: Yes, well they are
17 talking about holding that warning open until
18 midnight.

19 MR. COLLINS: Local time.

20 MALE PARTICIPANT: Local time.

21 MR. COLLINS: Yes, and I guess there's
22 been some aftershocks that I presume have the prospect
23 of creating more tsunami prospects, I don't know. But
24 I would expect that --

25 MALE PARTICIPANT: Okay. But I still think

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1 we are in a good spot with -- we haven't seen any
2 impacts to the plant --

3 MR. COLLINS: Yes.

4 MALE PARTICIPANT: and the surge level is
5 still in that three-foot range irrespective of the
6 wave action locally.

7 MR. COLLINS: Yes. Okay good. Any info you
8 all have, or have you heard from international
9 (inaudible)?

10 MS. HOWELL: No, the liaison team is still
11 working to pull some information Elmo, so there's
12 nothing new that we know beyond our last call.

13 MR. COLLINS: Okay.

14 MS. HOWELL: Now, they -- by the next one
15 you may have an update, I don't know.

16 MR. COLLINS: Yes. I think it will be
17 interesting.

18 MS. HOWELL: One other thing Elmo is that
19 they have had some potential damage to telephone
20 communication lines in Japan, (inaudible) it may
21 become more difficult to get information back and
22 forth.

23 MR. WEBER: Region IV.

24 MR. COLLINS: Region IV is on.

25 MR. WEBER: I apologize for that delay. We

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1 had -- our Japanese visitors were here and popped in
2 to give us at least their personal thoughts on the
3 seismic issue. No information really about the status
4 of the reactor (inaudible).

5 MR. COLLINS: Okay.

6 MR. WEBER: We are just circling back with
7 you. I understand that you wanted to have a discussion
8 about (inaudible) down in Region IV?

9 MR. COLLINS: Yes, this is Elmo, I would
10 offer that what we want to do is talk about how to
11 shape the agency's response moving forward.

12 MR. WEBER: Okay.

13 MR. COLLINS: I believe we envision Region
14 IV's role specifically with respect to U.S. licensees
15 becoming diminished, maybe non-existent. But we -- I
16 would offer the agency probably still has a role and
17 a need to stay in the monitoring mode.

18 MR. WEBER: Right.

19 MR. COLLINS: Okay.

20 MR. WEBER: Have the waves passed now
21 Diablo?

22 MALE PARTICIPANT: Yes, at Diablo they are
23 getting fluctuations in wave height in the local
24 coastal areas there, but nothing that exceeded the
25 anticipated surge at the plant itself.

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1 So that three-foot number is still a good
2 one for Diablo.

3 MR. WEBER: Okay, so nothing has surfaced
4 that would cause us to rethink where we are and --

5 MALE PARTICIPANT: Yes, that's right. If
6 you look on TV you will see a lot of footage showing
7 wave action in some of the harbors that are away from
8 the plant, capsizing boats and that kind of stuff.

9 But there has been no plant impact other
10 than that three-foot surge volume.

11 MR. WEBER: Okay. So ERM you are going to
12 secure your IRC and --

13 MR. COLLINS: Well, yes, and let's
14 elaborate on that point a little bit. So I'm going to
15 ask Troy and Linda to describe what we offer as to
16 what would be the right role for us in support.

17 MS. HOWELL: Okay, I have talked to Jane
18 Marshall, Mike, about maintaining some level of
19 cognizance of what is going on, and I guess what we
20 have discussed and would propose is that not seeing
21 any additional impacts at Diablo Canyon or anything
22 outside of the current projections, that we could
23 stand down here in Region IV but maintain a level of
24 cognizance on the international perspective, and
25 probably identify someone to join in any briefing

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1 throughout the evening and be able to get back to Elmo
2 if there were continual developments at the Japanese
3 plants, that he might have a level of interest in.

4 And what we could do is just give the HOOs
5 that individual's name and contact information and
6 they would just join in on any scheduled briefings
7 during the evening.

8 I guess they had some thought there at
9 headquarters about bringing some additional folks in
10 to continue monitoring on the international front.

11 MALE PARTICIPANT: That's correct.

12 MR. COLLINS: Yes, Mike, this is Elmo. I
13 would add just a small elaboration on what Linda said.
14 Part of the reason we want to do this is to stay
15 cognizant with respect to our alternate site
16 responsibilities.

17 MR. WEBER: Yes, I think that's fine. It's
18 your call. You know, we have the standard duty officer
19 capability and we know how to track people down out
20 there, but if you want to make a special arrangement
21 for having somebody designated as the point of
22 contact, we can certainly work with that back here.

23 MR. COLLINS: Yes, good. I think that
24 would be appropriate for what I perceive as the level
25 of interest in what is going on.

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1 MR. WEBER: Okay.

2 MALE PARTICIPANT: (Inaudible) capacity

3 (inaudible)

4 MS. HOWELL: Yes, I guess we will use me
5 Mike.

6 MALE PARTICIPANT: How long?

7 (Laughter)

8 MALE PARTICIPANT: We can't, phonetic,
9 possibly "can") do it for another 24, 48 hours.

10 (Laughter)

11 MR. WEBER: You are the energizer bunny.

12 (Laughter)

13 MS. HOWELL: And then I guess the other
14 thing is we talked about earlier, I will update the
15 plant status sheet that we have providing and forward
16 updates of that to the liaison team (inaudible)
17 forward.

18 MR. MCDERMOTT: Thanks Linda. This is
19 Brian. Just so you know, there was a press to get that
20 but so what we did was we kind of did a little bit of
21 a slightly redacted version of the one that went out
22 earlier, just to eliminate questions that were raised
23 that they knew were not an issue and some forth, and
24 provided that to some of the external stakeholders.

25 But the sooner that we get an updated

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1 version out the better.

2 MS. HOWELL: I will work with Tim and his
3 group to get a copy of that and then add on anything
4 that we need to add on to bring that up to current
5 status.

6 MR. WEBER: Thank you. Have you all
7 completed your turnover? I know you were working that
8 offline, I guess with Tim and also with Jane.

9 MS. HOWELL: I did with Jane. Tim was
10 briefing as we were talking so I will reach back to
11 him right after this phone call.

12 MR. WEBER: Okay. Are there specific
13 things that we ought to be focused on as we complete
14 this transition from your perspective?

15 MALE PARTICIPANT: The only thing that --
16 there was only two open things that I can think of. We
17 get the residents are still on their specific
18 counterpart link and we will have them drop off that
19 link, and then any plant issues will be communicated
20 back to the branch chief through our normal way of
21 doing business.

22 And then there's a -- you know we issued a
23 PEN (phonetic) and then once, according to the
24 guidance we have, the final PEN would be issued to
25 note the disposition of the NRC response.

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1 So our thinking is that we would probably
2 update that PEN during the business day on Monday, the
3 region would do that and the project branch would have
4 the lead for taking care of that.

5 MR. WEBER: So you would be doing that
6 later today or are you thinking about doing that on
7 Monday?

8 MALE PARTICIPANT: Doing that on Monday.

9 MR. WEBER: Okay.

10 MALE PARTICIPANT: Yes, because there is
11 no change to plant status and they expect to stay in
12 the tsunami warning condition at least until midnight
13 today.

14 MALE PARTICIPANT: Okay. I would just put
15 a point on the idea of needing to provide updates to
16 some of the Congressional stakeholders. We have had
17 inquiries from one, two, three, four -- four offices
18 directly and then one from the appropriations
19 committee.

20 MALE PARTICIPANT: Congressional offices.

21 MALE PARTICIPANT: Yes, Congressional
22 offices. So we are going to be talking here shortly
23 about what staffing we need to maintain over the
24 evening.

25 MR. WEBER: You might anticipate questions

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1 that could evolve during the weekend regarding the
2 design basis for U.S. facilities, and if you had an
3 earthquake of this magnitude, is that within the
4 design basis, is the tsunami within the design basis.

5 I don't think we need to answer the
6 question beyond what we have in that nice summary
7 table that we have, but there may be a need to reach
8 back at some point to get some specific question
9 answered.

10 MALE PARTICIPANT: Okay.

11 MR. COLLINS: Yes, that's -- and we would
12 support that Mike.

13 MR. HOWELL: Yes Mike, this is Art, we
14 also have the same similar table for San Onofre and
15 we also have information on the INSTIC (phonetic) at
16 Humboldt Bay has nine criteria.

17 MR. WEBER: Okay. All right.

18 MR. MCDERMOTT: And you may know -- this
19 is Brian again -- and you may know better than we do
20 because OPA is operating out of their normal offices
21 so they are not actually right here with us.

22 I don't know if they are looking for
23 support on anticipated questions for the media along
24 that line, written at a higher level, but maybe your
25 public affairs officer could engage them just to see

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1 that -- to get what they need.

2 MALE PARTICIPANT: Yes, she has been doing
3 that all along.

4 MR. MCDERMOTT: Okay, thank you.

5 MR. WEBER: Okay, anything else you need
6 from us?

7 MR. COLLINS: Yes, Mike, this is Elmo.
8 Just a couple of thoughts. One, it seems to me we --
9 and maybe you have more info than I do -- but we are a
10 ways away from knowing whether or not there's a severe
11 incident at this Japanese facility.

12 So it -- in this day and time, you know,
13 with communication, and if there were to be an
14 accident anywhere in the world, you know, we would
15 need to be ready to respond accordingly, at the risk
16 of stating the obvious.

17 And you know, I am getting some sense that
18 other sites and nuclear plant executives are getting
19 questions and interactions from reporters as well, so
20 there's a high level of interest.

21 MR. WEBER: Any ideas on whether we have a
22 need (phonetic) to play in fulfilling that interest or
23 it's just an awareness?

24 MR. COLLINS: Well we have a -- right now
25 it's at least an awareness. We have a press release

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1 out indicating what we have done, where we are at in
2 our response. I think it's going to hinge on, Mike,
3 what's really going on with this reactor in Japan.

4 MR. WEBER: Yes, the latest info that we
5 have suggests that there's two units in trouble.

6 MR. COLLINS: Okay.

7 MR. WEBER: And that's based on a press
8 release from Tokyo Electric Power Company.

9 MR. COLLINS: Okay. Just at the risk of
10 belaboring it, these station blackout scenarios at a
11 boiling water reactor, is that what we are dealing
12 with?

13 MR. WEBER: Yes.

14 MALE PARTICIPANT: Yes.

15 MR. WEBER: One with an ISO condenser and
16 one with RICH-TSY (phonetic).

17 MR. COLLINS: I got it. And so what that
18 means is the report we heard where they had to vent
19 (phonetic) what I presume is the containment, makes a
20 lot of sense. That's several hours into the event, I
21 think that's where you would find yourself.

22 MALE PARTICIPANT: That's what we were
23 thinking as well, Elmo. One thing, I am just talking
24 out loud, one of the things that we know from dealing
25 with NEI, INPO and EFRI on their plans for response,

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1 is that NEI was going to take the lead for the
2 communication piece on the industry side as opposed to
3 any of those other organizations weighing in.

4 So one of the things we could do when we
5 get more folks in here is start looking at what is NEI
6 putting out and you know, hopefully they are focused
7 on this. I can't imagine they wouldn't be at this
8 point. But we might touch base with them.

9 MR. COLLINS: Good. I appreciate that. How
10 are we communicating with INPO?

11 MR. MAMISH: What communication Elmo?

12 MR. COLLINS: I'm sorry, what?

13 MR. MAMISH: What information are you
14 referring to, international or domestic?

15 MR. COLLINS: Well, it's international,
16 but INPO gets some information.

17 MALE PARTICIPANT: Well, INPO gets info
18 from WANO.

19 MR. COLLINS: Right.

20 MALE PARTICIPANT: And to my knowledge, we
21 haven't interacted with either organization in
22 response to this incident.

23 MR. COLLINS: I guess that would be
24 something to keep in the back of our minds.

25 MALE PARTICIPANT: Yes. In terms of those

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1 roles and the different industry organizations I
2 mentioned, INPO's role as they have structured it, is
3 to actually act as a clearinghouse, so for physical
4 equipment and hardware type things that they might
5 need in this country.

6 I am not aware of any agreement where they
7 would be providing that internationally.

8 MALE PARTICIPANT: But certainly in an
9 emergency, if the operator decided they needed help,
10 expert advice, they can certainly reach out --

11 MR. COLLINS: Right. It's a resource.

12 MALE PARTICIPANT: and if they reach back
13 to us, we would connect them with the right folks at
14 INPO and NEI.

15 MR. COLLINS: Right. That's right. Yes.
16 Okay.

17 MALE PARTICIPANT: We have heard no
18 questions Elmo, from Japan at this point in terms of
19 requests for resources coming through the State
20 Department or, you know, to NRC directly even, other
21 than that one request.

22 MR. COLLINS: There have been some really
23 bizarre reports, what I have seen on TV, you know
24 things like the Air Force is bringing in special
25 coolant material. Have you all heard that stuff?

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1 MALE PARTICIPANT: [REDACTED]

2 [REDACTED]

3 [REDACTED]

4 [REDACTED]

5 [REDACTED]

6 [REDACTED]

7 So something may have gotten lost in

8 translation somewhere.

9 MR. COLLINS: Yes, well, apparently, I

10 would offer, but --

11 (Laughter)

12 MR. COLLINS: Okay, good.

13 MALE PARTICIPANT: Thank you very much for

14 the excellent support Region IV.

15 MR. COLLINS: Yes, and we are ready and we

16 will do whatever we need to do. So --

17 MALE PARTICIPANT: And we know that to be

18 true.

19 MALE PARTICIPANT: So Mike, in about, what

20 do you want to call it, 15:05, you guys took the lead

21 for monitoring?

22 MR. WEBER: That sounds fine.

23 MALE PARTICIPANT: Okay.

24 MR. WEBER: Thank you very much.

25 MR. COLLINS: Okay Mike. Thank you.

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1 MR. WEBER: Thank you.

2 (Conference call concludes at 11:51

3 a.m./06:48 a.m.)

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1 (CONFERENCE CALL INITIATED)

2 11:51 a.m./06:48 a.m.

3 MS. HARRINGTON: Hello, how are you.

4 MALE PARTICIPANT: Good, how are you?

5 MS. HARRINGTON: I am fine. I need to pass
6 on to you, I can hear my echo, a request that we have
7 gotten from USAID.

8 MALE PARTICIPANT: Okay.

9 MS. HARRINGTON: Evidently they have been
10 asked to put together a potential group of federal
11 government staff who might be deployed to Japan if the
12 U.S. government is asked to help.

13 So you can see there were lots of caveats
14 in there. So they were calling, I guess, the public
15 affairs office because they didn't know who else to
16 call, wanting to know what personnel and expertise the
17 NRC might be able to offer as part of this potential
18 group.

19 So I have a name and a phone number.

20 MALE PARTICIPANT: Okay.

21 MS. HARRINGTON: The contact person is
22
23
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1 MS. HARRINGTON: Correct, and this is
2 USAID.

3 MALE PARTICIPANT: Okay.

4 MS. HARRINGTON: All-righty?

5 MALE PARTICIPANT: Liaison is all over it.

6 MS. HARRINGTON: Thank you.

7 MALE PARTICIPANT: Thank you.

8 MS. HARRINGTON: Bye-bye.

9 (Conference call concludes at 11:53
10 a.m./06:50 a.m.)

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1 (CONFERENCE CALL INITIATED)

2 11:54 a.m./06:51 a.m.

3 CHAIRMAN JACZKO: Hello?

4 MALE PARTICIPANT: Hello Chairman.

5 CHAIRMAN JACZKO: How are you?

6 MALE PARTICIPANT: Good. Did you get the
7 message from Patty? (Phonetic).

8 CHAIRMAN JACZKO: Yes.

9 MALE PARTICIPANT: We are being advised
10 through agency contacts that you can anticipate a
11 request to participate in the deputies committee
12 meeting at five o'clock today.

13 CHAIRMAN JACZKO: Okay.

14 MALE PARTICIPANT: And we would certainly
15 offer to give you a briefing of what we know, before
16 you head out.

17 CHAIRMAN JACZKO: What you are going to
18 need to do is you are going to need to have a book
19 ready for me that has all the information we need, and
20 that is a status and update on our plants and then
21 information about all the facilities in Japan.

22 MALE PARTICIPANT: Okay, our plants are
23 all fine.

24 CHAIRMAN JACZKO: Okay. So if I am in that
25 room everyone is going to look to me to know what is

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FJ 2525 of 2725

1 going on at the Japanese plants. So in the next 25, 30
2 minutes we need to put all that together in something
3 that I can take with me down to a meeting at the White
4 House.

5 MALE PARTICIPANT: Okay.

6 CHAIRMAN JACZKO: And you know, where the
7 plants are, what they are, what types of designs,
8 whatever we know about them, what possible issues
9 there could be going on, and then I'll need somebody
10 with technical competence to go with me.

11 MALE PARTICIPANT: Okay.

12 CHAIRMAN JACZKO: And whoever you think is
13 the best person for that.

14 MALE PARTICIPANT: All right, we'll sort
15 that out here.

16 CHAIRMAN JACZKO: Good, now --

17 MALE PARTICIPANT: Are you going down by
18 vehicle or by metro?

19 CHAIRMAN JACZKO: Car.

20 MALE PARTICIPANT: Car. Okay.

21 CHAIRMAN JACZKO: And I recognize that
22 this is a lot to do in a very short period of time but
23 it is probably what we will have to do. And the other
24 thing, I also have a call to the State Department that
25 I need to return and again, it's from their office

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FJ 2526 of 2725

1 that deals with basically helping coordinate resources
2 we can provide or requests for resources.

3 So I just want to confirm with you that at
4 this point we do or do not have requests for
5 assistance from Japan.

6 MALE PARTICIPANT: We have not received a
7 request for NRC assistance from Japan.

8 CHAIRMAN JACZKO: Okay.

9 MALE PARTICIPANT: We have had a call with
10 HHS on the availability of potassium iodide if it were
11 to be necessary.
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1 (CONFERENCE CALL INITIATED.)

2 MALE PARTICIPANT: We have not received a
3 request for NRC assistance from Japan.

4 CHAIRMAN JACZKO: Okay.

5 MALE PARTICIPANT: We have had a call with
6 HHS on the availability of potassium iodine if it were
7 to be necessary.

8 CHAIRMAN JACZKO: Okay.

9 MALE PARTICIPANT: And we've answered that
10 call, but it does not appear that that's a very viable
11 approach.

12 CHAIRMAN JACZKO: Yeah, okay. Okay.

13 Do we have any other information? Is, is
14 the event escalating in Japan?

15 MALE PARTICIPANT: It appears to be so,
16 although we still have very limited information.

17 CHAIRMAN JACZKO: Okay.

18 MALE PARTICIPANT: And we're getting
19 information from a variety of sources.

20 CHAIRMAN JACZKO: Okay.

21 MALE PARTICIPANT: The most recent
22 information we got was from the IAEA, which suggested
23 that there's about 1.3 meters of water above Unit 1
24 joule.

25 CHAIRMAN JACZKO: Okay.

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FJ 2528 of 2725

1 MALE PARTICIPANT: And that's of concern.

2 CHAIRMAN JACZKO: If we can, put that in
3 the updates that you've been doing and get that out in
4 the next 10 minutes and get that out to the
5 distribution that we've been giving that to.

6 MALE PARTICIPANT: Okay. We will make
7 every attempt to do that.

8 Jack, let me confirm that --

9 Jack Ramsey just gave me information that
10 says it's the Deputy's VTC.

11 JACK RAMSEY: Yeah, Chairman, you're going
12 to -- we've been told that you're going to get an
13 invitation through your office to participate in the
14 Deputies Committee Video Teleconference.

15 CHAIRMAN JACZKO: Okay.

16 JACK RAMSEY: That's currently for 5:30.
17 Apparently, it's a bigger picture of Japan. It's not
18 anything specific to nuclear.

19 CHAIRMAN JACZKO: Okay. I tell you, but
20 they, they will look to me for the nuclear
21 information, so I'm still going to need to have that.

22 JACK RAMSEY: Right.

23 CHAIRMAN JACZKO: Okay. Good.

24 JACK RAMSEY: But that least saves us the
25 time from going downtown.

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FJ 2529 of 2725

1 CHAIRMAN JACZKO: Absolutely. It gives
2 you a little more time.

3 JACK RAMSEY: Yep.

4 CHAIRMAN JACZKO: But if we can get the
5 update out about what we know as credible information
6 about the level, you know, and, and then again, only
7 accurate information. But I think if you, if that's
8 from IAEA, we can trust that as accurate. And let's
9 get that out to, to the people that we've been
10 distributing the information to, as quickly as
11 possible.

12 JACK RAMSEY: Okay.

13 MALE PARTICIPANT: Chairman, your, your
14 request from HHS, or from the State Department, is
15 that USAID?

16 CHAIRMAN JACZKO: Yes, it is.

17 MALE PARTICIPANT: Okay. Is that the same
18 request that we've been responding to here?

19 CHAIRMAN JACZKO: I, I, I don't know.
20 It's a high-level phone call, so I'll, I'll, I'll let
21 you know after I have it.

22 MALE PARTICIPANT: Okay. What the, just
23 so you're aware, the issue we've been working with
24 here is, if we were requested to send NRC staff among
25 a group of government officials to Japan to provide

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FJ 2530 of 2725

1 support, what kind of support and people could we
2 provide for that function.

3 CHAIRMAN JACZKO: Got it. That's been in
4 the back of my mind, what they would likely ask.

5 MALE PARTICIPANT: Okay.

6 CHAIRMAN JACZKO: I'll let you know after
7 I have that call.

8 MALE PARTICIPANT: Okay.

9 CHAIRMAN JACZKO: Thanks, everybody.
10 Anybody else?

11 MALE PARTICIPANT: We will be over --
12 let's see -- the VTC will take place in the SCIF?

13 CHAIRMAN JACZKO: Yeah, let's give it in
14 the SCIF.

15 MALE PARTICIPANT: In 2 White Flint
16 (phon)?

17 CHAIRMAN JACZKO: No, 1, let's do it in 1.
18 It's better.

19 MALE PARTICIPANT: Yeah, I'm sorry, 1
20 White Flint.

21 CHAIRMAN JACZKO: Right.

22 MALE PARTICIPANT: So we'll have to get
23 that queued up too.

24 CHAIRMAN JACZKO: Okay, good. And again,
25 I think it's important for us to provide accurate

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FJ 2531 of 2725

1 information as timely as we can, and so, if you can,
2 continue with the updates as we get reliable and
3 accurate information.

4 MALE PARTICIPANT: Okay.

5 CHAIRMAN JACZKO: Okay, thanks everybody.
6 I appreciate it.

7 MALE PARTICIPANT: Thank you.

8 CHAIRMAN JACZKO: Sure.

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1 this is what, you know, is the bottom line from those.

2 BILL RULAND: Okay, well, no, it's really
3 just a short statement for all of these --

4 A TEPCO press release indicated loss of
5 off-site power, of course, loss of all power to the
6 freight unit at 146 a.m. Eastern time, which was 2:46
7 p.m. Japan time.

8 A TEPCO press release indicated that Unit
9 4 was shut down due to the earthquake and that 5 and 6
10 were already in an outage.

11 A TEPCO press release also said that Units
12 1 through 3 automatically shut down at 1:46 a.m.
13 Eastern time, which is, looks like it's an hour after
14 the earthquake.

15 A TEPCO press release indicated that all
16 units' off-site power was lost at about 1:46 a.m.
17 Eastern time, leading to automatic startup of the
18 emergency diesel generators.

19 A TEPCO press release at 2:41 a.m. Eastern
20 time stated that the emergency diesel generator was
21 shut down to Units 1, 2 and 3, resulting in the
22 complete loss of AC power for those units.

23 And an IAEA of, as of 2:45 p.m. Eastern
24 time indicated that the Unit 1 water level was about
25 51 inches above the top of the core. For Unit 2, core

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1 coverage was about 138 inches. And for Unit 3, IAEA
2 indicated that power is being supplied.

3 And then we just got a recent TEPCO press
4 release that stated that they're implementing measures
5 to reduce the pressure of the reactor containment
6 vessel for those units that cannot confirm certain
7 levels of water injection by RCC in order to fully
8 secure safety. And they also said that they're
9 monitoring off-site, and one of the monitoring posts
10 is also indicating a higher than normal levels. "We
11 will continue to monitor discharge of radioactive
12 material from the exhaust stack and the discharge
13 canal," et cetera.

14 MALE PARTICIPANT: The only other issue to
15 add to Bill's summary is that we know that NISA, the
16 Japanese regulatory authority, declared a heightened
17 state of alert and a precautionary evaluation,
18 evacuations up to three kilometers were ordered, and
19 residents between three kilometers and 10 kilometers
20 were ordered to stay in place and centrally, shelter
21 in place, stay indoors.

22 PATTY: Okay, thank you. I think others
23 may have questions.

24 MIKE WEBER: Just iterate, so, as Bill
25 Borchardt has cautioned us, this scenario that we

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1 developed would be consistent with this, but that's
2 all it was.

3 CINDY PETERSON: Bill, this is Cindy
4 Peterson in Region III. Just, we got some breaking
5 news here that might be of interest.

6 We been notified -- or not notified --
7 we've been informed that Exelon has been asked by GE
8 to run simulator runs on Dresden, which is similar to
9 Unit 1, which is an iso-condenser plant, and Quad
10 cities, which is similar to Unit 2 (audio feedback)
11 plant. And (audio feedback) Exelon is supporting them
12 with running some scenarios to see how the events will
13 evolve.

14 BILL RULAND: Okay.

15 CINDY PETERSON: So you may want to, Bill,
16 hook up with somebody in Exelon, and if you call me,
17 we can try to work out who it is you may talk to.
18 They may have some additional information that could
19 be of use --

20 BILL RULAND: Okay.

21 CINDY PETERSON: -- should you wish to go
22 that far.

23 MIKE WEBER: Cindy, again, who asked them
24 to run that calculation?

25 CINDY PETERSON: Our understanding is

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FJ 2535 of 2725

1 General Electric asked them, but the connection
2 clearly is with and, we believe, tied to a request
3 from TEPCO. That's not confirmed.

4 MIKE WEBER: We did reach out earlier in
5 the day to NEI, and also, Marty, you reached back to
6 INPO and WANO. Do you want to update on that?

7 MARTY: The information is still trickling
8 in. That was INPO that just called, and they're
9 getting some insights from WANO Tokyo that the Unit 2
10 containment pressure is about two times its design. I
11 just gave the whole -- we need to confirm our
12 pressures.

13 MALE PARTICIPANT: Right.

14 MARTY: Is that about right?

15 MALE PARTICIPANT: Right.

16 MARTY: Radiation levels around Unit 1 to
17 control rooms are running about a thousand times what
18 they normally run and that evacuations have been
19 called for.

20 What INPO and NEI are going to be doing is
21 they're going to be setting up conference call and
22 sharing information at a regular interval. NEI source
23 is the Tokyo equivalent of NEI, and so they have been
24 communicating, but they're not getting much more than
25 we're getting. Most of the information is disjointed,

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1 and it's a little bit confused at this point in time.

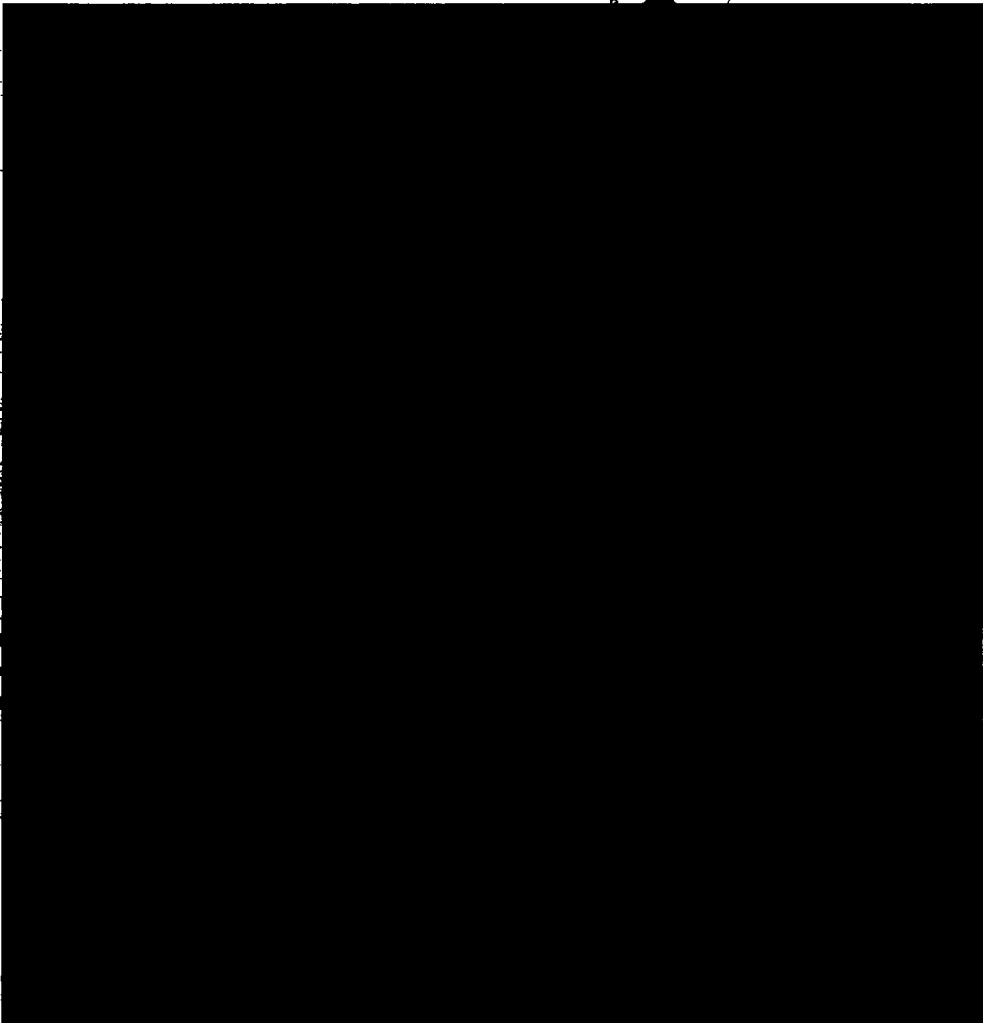
2 But you can see -- and I've not been able
3 to connect with anybody from WANO yet.

4 MIKE WEBER: Thanks.

5 We have many preparations to continue to
6 staff a skeleton crew overnight. We would expect the
7 situation to continue to develop, and we continue to
8 perform a communication/coordination function here in
9 the off-center.

10 Anything else? Here?

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MIKE WEBER: Understood.

LARRY CAMPER: This is Larry Camper. What are we doing to communicate externally? I mean, I've heard three or four salient points here, which I'll recap.

I mean, Mike, earlier, you pointed out that this is an extreme event, and then there's this question of, is this within design basis for our facilities?

There are certain analyses going on. You know, Cindy, you pointed out what's going on at Dresden and Quad cities.

We're staffing overnight and so forth and so on.

I mean, it strikes me that there are three salient points that come out of this discussion. Are we communicating externally, and if so, how?

MIKE WEBER: What we've prepared to do is

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1 to respond to questions as asked. But as an agency,
2 we do not intend to get out in front of the rest of
3 the US government or out in front of Japan. So, if
4 asked, you know, how is it preparing the United
5 States, what steps have you taken to prepare against
6 it, we can answer those kinds of questions.

7 REBECCA: This is Rebecca, and I was
8 interested to find out, is a protective measures team
9 being put in place? Have we modeled to see whether or
10 not, if this happened, what area will be impacted,
11 looking at the radiological data and things like that?
12 Or have we thought about that?

13 MIKE WEBER: No, the protective measures
14 team has not been put in place, but Bill has an
15 update.

16 BILL RULAND: Yeah, there's about, about,
17 four people. And the reactor safety team is going to
18 be about the same. These are skeleton crews,
19 basically a couple of analysts and a coordinator, so
20 it's basically a, a bare-bones skeleton crew to be
21 able to help answer the questions if asked.

22 MIKE WEBER: If there were a release and
23 it was a sizable relief, we could expect that the
24 plume will migrate to the east towards Hawaii and then
25 to the United States, based on current meteorological

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1 conditions. And so we can anticipate, there could be
2 questions about, well, you know, what does that mean
3 to the United States? And, what actions need to be
4 taken? But that's hours down the road, and that would
5 not be done by NRC. That would be done in
6 coordination with other agencies like EPA, DOE,
7 Department of Defense, FEMA.

8 Other questions?

9 MIKE SNODDERLY: Yes, this is Mike
10 Snodderly. I just wanted to follow up on what -- I
11 heard Bill say that they had looked at some SORCA
12 analyses that had been done for a BWR plant that had
13 lost RCC for 14 hours and so are those conditions
14 consistent with what --

15 BILL RULAND: As to, to kind of reiterate
16 what Bill Berghardt had said, you know, we don't want
17 to -- you know, the purpose of our analyses was to try
18 to understand what was going on such that we would be
19 able to answer questions about it. And what we did
20 was we looked at the sort of analysis and we tried to
21 decide what the time line would be, what the time line
22 would be, and the time line is consistent with the
23 SORCA analysis --

24 MIKE SNODDERLY: Thank you.

25 BILL RULAND: -- including the, the

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1 venting. The timing of the venting is consistent with
2 that SORCA analysis.

3 MALE PARTICIPANT: Okay, thanks. We're
4 going to go on mute here for a minute.

5 (Whereupon there was a long pause on the
6 record.)

7 MATT HAHN: Hey, this is Matt Hahn with
8 ILTAB. Has there been anything new or different with
9 Diablo Canyon or Region IV, what they're planning on,
10 or what they're doing out there right now?

11 MIKE WEBER: All the US nuclear facilities
12 and materials are not at risk at this point. So,
13 Region IV has stood down in their emergency response,
14 and the tsunami did not cause adverse damage to
15 nuclear facilities. So, for US assets, we're secured.

16 LARRY: Mike, has that been communicated
17 publicly?

18 MIKE WEBER: I don't know.

19 LARRY: Well, I tell you, I'm not coming
20 away with a warm-and-fuzzy about public communication
21 here. I mean, the point you just made is, is a very
22 valuable point to be communicated, and in our entire
23 conversation, I've not heard some orchestrated
24 approach to how the United States government,
25 whichever entity that is, will communicate as to the

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1 status.

2 I, I'm concerned about eight, you know, a
3 strong public reaction or overreaction and I think
4 there needs to be some concern or attention to how
5 this all gets communicated. I mean, we have a role to
6 play here. It's, it's a refined role, that is true,
7 but I'm not just not coming away comfortably with
8 public communication.

9 MIKE WEBER: Yeah, Larry, did you see the
10 press releases?

11 LARRY: No, I did not, Mike.

12 MIKE WEBER: Okay, well. . .

13 ELLIOTT: Mike, it's Elliot. We have put
14 out -- excuse me, Larry, or whoever was speaking -- we
15 got two releases out. The most recent one was filed
16 probably an hour ago. You can find on the web. It
17 says that senior officials at the Headquarters are
18 following events. In addition, the agency's regional
19 office will continue to monitor the notice of unusual
20 events at Diablo for the duration of that event," and
21 it goes on.

22 LARRY: Great. Okay, sorry. I didn't see
23 that.

24 ELLIOTT: And, in the keeping people
25 current department, I know we've all seen the last

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1 TEPCO press release. I had just been sent a, a short
2 little snap bulletin from Reuters. It says, "TEPCO
3 says it has lost the ability to control reactor
4 pressure at three of the reactors." And I don't know
5 whether that, technically, whether that supersedes
6 what we were looking at, but I just had a press person
7 ask me about it.

8 (Whereupon, the parties engaged in off mic
9 conversation.)

10 MIKE WEBER: That's, that's breaking news.

11 We haven't gotten that through any official channels.

12 ELLIOTT: It's probably a time lag with
13 TEPCO getting stuff up on its English-language site.

14 MIKE WEBER: Yeah, it may be.

15 MALE PARTICIPANT: You know, and sometimes
16 they confuse reactor vessel, containment vessels.

17 MIKE WEBER: Okay. Do we want to go back
18 on mute?

19 Are we done with the call?

20 No more questions from the commission
21 assistants?

22 The --

23 MALE PARTICIPANT: (Inaudible) -- and I
24 have a question. Are we planning on having a
25 regularly scheduled update call?

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1 MALE PARTICIPANT: That's what I just
2 trying to get to. Mike mentioned earlier, we're
3 staffing up -- I'm sorry -- planning for the second
4 shift to come in. Bill's noted it is sort of a
5 skeleton crew, but there's enough in terms of
6 communication going on within the government that we'd
7 like to stay on top of this and use the Ops Center as
8 our focal point for that.

9 In terms of updated briefings, I think the
10 way we left it with you all last time was that, as
11 significant events develop, then we would reach back
12 out. It just may be --

13 Eleven o'clock is the turnover time?

14 MALE PARTICIPANT: Turnover.

15 MALE PARTICIPANT: So, Mike, since he's,
16 he'll be the one who's going to be stuck here, maybe
17 if we try to offer a brief at 11:15 so that you and
18 them, being the two parts, a relieving group and the
19 off-guard will both be here, then anybody else who's
20 interested in hearing the status would hear that
21 knowledge and then we'll look at that in full.

22 Do we have the next release planned?

23 MALE PARTICIPANT: Sure.

24 MALE PARTICIPANT: What time is that?

25 Seven a.m.?

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1 MALE PARTICIPANT: Yeah, and we'll do it
2 again at 7:15.

3 MALE PARTICIPANT: Is that, is that all
4 right?

5 MALE PARTICIPANT: Yeah.

6 JOHN MONNINGER: This is John Monninger.
7 I think the notion of any type briefing, you know, we
8 would agree with, if any, new, significant information
9 comes along, it would be appropriate.

10 PATTY BUBAR: John, this is Patty Bubar.
11 I was actually going to ask questions. I'm glad you
12 spoke up. Will we get any feedback from what's coming
13 out of the deputy's meeting at the White House, or
14 with the White House?

15 JOHN MONNINGER: To tell you the truth, I,
16 I'm not sure, but I'll chat with Joshua on that.

17 PATTY BUBAR: Okay.

18 JOHN MONNINGER: I think, you know, as
19 Bill mentioned -- I guess, as both Bills mentioned --
20 you know, we did do some analysis, but what is really
21 important here is to make sure that we do not
22 inappropriately communicate, you know, the preliminary
23 analysis that the NRC has done for whatever purposes.
24 You know, the communications should be maintained
25 through Public Affairs and through, you know, other --

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1 PATTY BUBAR: Right. Well, why I thought
2 if there was a coordinated government communication
3 strategy that comes out of the discussion, that, you
4 know, that would be helpful to know.

5 JOHN MONNINGER: So we'll get back to you
6 on that, Patty.

7 PATTY BUBAR: Thank you.

8 MIKE WEBER: If there are no other
9 questions, we'll plan to have a follow-up call at
10 11:15 tonight, 2315.

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NOT FOR PUBLIC DISCLOSURE

1 (CONFERENCE CALL INITIATED.)

2 KEVIN WILLIAMS: Hello, this is Kevin
3 Williams. Can you hear me?

4 MIKE WEBER: Go ahead, Kevin. We are
5 here.

6 KEVIN WILLIAMS: Okay. I'm down here at
7 USAID and I was just talking with [REDACTED]
8 (phon), and he wanted me to relate to you guys what
9 their needs are down here.

10 MIKE WEBER: Okay.

11 KEVIN WILLIAMS: And I think what they're
12 really wanting is someone who can interpret, you know,
13 the information that's put out in relation to the
14 plant. You know, their, what's going on, what's
15 happening, how are they evaluating, how are they
16 responding. And they are going to have someone come
17 from DOE come down here as well. There's an
18 individual from Atlanta that's coming down just to
19 assist with USAID.

20 But what they're looking for more so is
21 the interpretation of the information that's being put
22 out. For example, I think I just saw something on
23 there that the radiation levels at the plant are a
24 thousand times normal.

25 MIKE WEBER: Yeah.

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1 KEVIN WILLIAMS: You know, and they want
2 to put it --

3 MALE PARTICIPANT: Kevin, why are they
4 doing that versus the NRCC or just calling back here
5 to the Ops Center?

6 KEVIN WILLIAMS: I'm sorry. Repeat the
7 question.

8 MALE PARTICIPANT: Why, why did USAID see
9 the need to do that instead of relying on established
10 inter-agency coordination mechanisms like the NRCC or
11 just calling the Ops Center?

12 KEVIN WILLIAMS: They're not wanting to do
13 it. They're just, they're just wanting to know how to
14 interpret appropriately as they're, you know, talking
15 to their management.

16 MIKE WEBER: Can't they just call our ops
17 center with questions?

18 KEVIN WILLIAMS: I believe so, yeah.

19 JEFF TEMPLE: I have a --

20 KEVIN WILLIAMS: Pardon me?

21 (Whereupon, the parties engaged in
22 simultaneous conversation.)

23 JEFF TEMPLE: Yeah, this is Jeff Temple.
24 You mentioned about a nine o'clock conference call
25 they're having?

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1 KEVIN WILLIAMS: There's a nine o'clock
2 conference call, but I believe that's within their
3 organization and their, their scope of, of how they
4 interact. And I'm getting, now, a good appreciation
5 for their process. I wanted to participate in that
6 nine o'clock call so I'd have a better, better
7 understanding of what they're really trying to get at.

8 And then I think really all they need is a
9 point of contact back at the NRC, whether that's
10 calling in through the Ops Center or following the
11 established protocol. I think that's probably the
12 best way to do it.

13 MIKE WEBER: We heard that NRCC was likely
14 going to stand down.

15 KEVIN WILLIAMS: I haven't heard that. I
16 mean, I understand that. I know, here, they're
17 ramping up to do more of the 24/7 staffing.

18 MALE PARTICIPANT: Yeah. Right.

19 MIKE WEBER: Kevin, do they have whole
20 (inaudible)?

21 KEVIN WILLIAMS: I don't know. I just got
22 here, actually. I'm trying to figure out what, you
23 know, what their, what their role is.

24 MIKE WEBER: So it sounds like it's an
25 international response coordination function rather

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1 than a domestic response.

2 KEVIN WILLIAMS: Yeah, and I'm just trying
3 to have a better feel for the, how I can convey that
4 back to them.

5 MALE PARTICIPANT: (Off mic) -- take a
6 look at these?

7 MIKE WEBER: Hey, Kevin, two things. As
8 you're on your on your BlackBerry, I know they have a
9 notorious problem with over-modulating the mic, so, if
10 you kind of hold the microphone into that thing a
11 little farther away from your mouth, we'd probably be
12 a little more clearly.

13 In terms of staffing here, we have the
14 liaison team, and that is the gateway, if you will,
15 for our federal partners to be asking for information.

16 So I would encourage whoever is helping coordinate
17 the USAID effort and asking these questions to use
18 that, that resource.

19 KEVIN WILLIAMS: Okay.

20 MIKE WEBER: The second thing is I know
21 you just got that down there too long ago, but what
22 does the picture look like in terms of, do we need to
23 plan to have somebody down there around the clock?

24 KEVIN WILLIAMS: No. I think what they're
25 really looking for is just an, a point of contact.

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1 And I think the thing that Mike Weber has just talked
2 about it is something that we could put into, into
3 play, and they'd have a way of getting the
4 information.

5 MIKE WEBER: Okay, great.

6 KEVIN WILLIAMS: But there is, there is a
7 nine o'clock call tonight I wanted to get in on and
8 just get a better feel for, you know, now we can
9 assist and probably get back and say, okay, here's how
10 I think this ought to play out.

11 MIKE WEBER: Okay. Sounds good.

12 Do you need any additional support from us back here,
13 Kevin?

14 KEVIN WILLIAMS: No. The only thing I
15 actually really was wondering and this could go with
16 the initial that everybody was, you know, what, in
17 proper context, you know, what's really going on at
18 the plant in Japan, you know, to have a better feel
19 for what's going on there. Are they able to get, you
20 know, whatever they were trying to get back so that
21 they could provide the, get the cooling water going or
22 something like that?

23 MIKE WEBER: Yeah, we have no concern,
24 reports back, Kevin, in terms of restoration of
25 capabilities. You know, the, the scenario that, that

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1 we're hearing is, is what's in the press. So, and I'm
2 sure they have access to that down there as well.

3 KEVIN WILLIAMS: Yes, they do.

4 MIKE WEBER: So, you know, we're trying
5 not to speculate at this point. Although, you know,
6 we, we do have folks looking at the event, we don't
7 want to be out too far because there could be a lot of
8 information that we don't have. But clearly it's a
9 serious event.

10 KEVIN WILLIAMS: Right, understood.

11 JOHN MONNINGER: The report of a thousand
12 times background -- it would make sense to say we're
13 venting containment?

14 KEVIN WILLIAMS: Yes, right, that's what I
15 understood.

16 JOHN MONNINGER: Right, okay.

17 KEVIN WILLIAMS: And I can explain that.

18 JOHN MONNINGER: Okay.

19 KEVIN WILLIAMS: John, is there a specific
20 number under the, the basic number I called in to get
21 the (inaudible) too.

22 JOHN MONNINGER: Yes, you can just call
23 back into HOOs, and they'll, they'll patch you through
24 to the liaison team.

25 KEVIN WILLIAMS: Okay. Understood.

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FJ 2552 of 2725

1 JOHN MONNINGER: And, and they'll do that
2 for you or for, you know, who, over the USAID people
3 are.

4 KEVIN WILLIAMS: Right, understood.

5 MIKE WEBER: And Kevin, so you know, we
6 are staffing up another shift that will turnover at
7 about 11 o'clock here, and we will have another
8 Commissioner Assistants brief at 11:15. So, depending
9 on where you are, you know, if somebody is relieving
10 you, they'll want to call in for that call, and you
11 should assure the USAID folks down there that, you
12 know, we're, we're going to be here to support them if
13 they have questions.

14 KEVIN WILLIAMS: Right. Okay.

15 JOHN MONNINGER: Thank you.
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1 (CONFERENCE CALL INITIATED.)

2 MIKE WEBER: Hey, Michael. Go ahead.

3 MICHAEL DUDEK: Just a brief update from
4 down here at FEMA. I have, I have a little bit of the
5 synopsis of the deputies meeting in case you haven't
6 heard her, and I have a status of where they're going
7 and what they're doing over the weekend.

8 MIKE WEBER: Sounds good. Let's hear it.

9 MICHAEL DUDEK: Do you, first of all, do
10 you have any additional questions for me?

11 MIKE WEBER: Yes. Tell us what you're
12 going to tell us.



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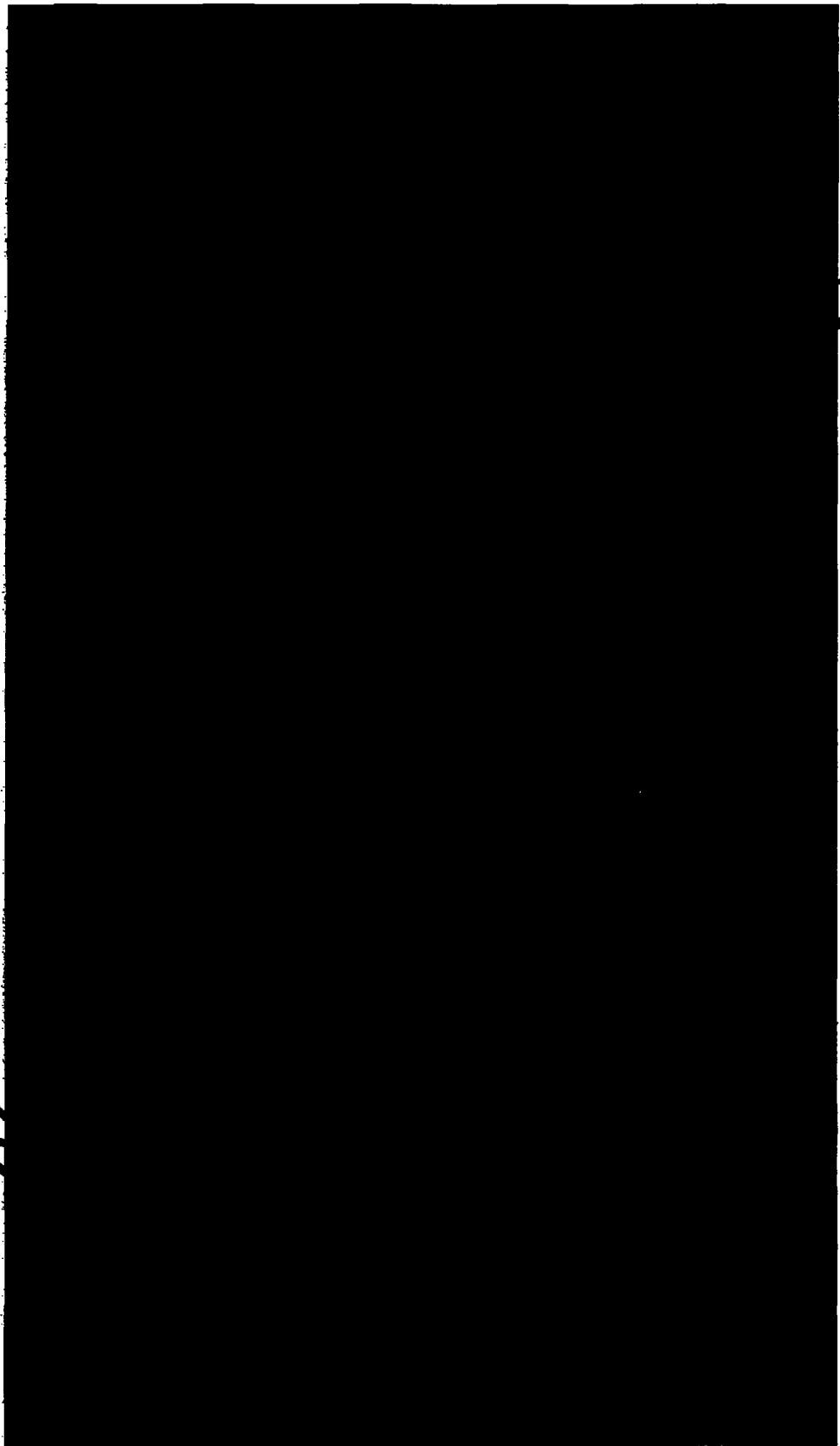
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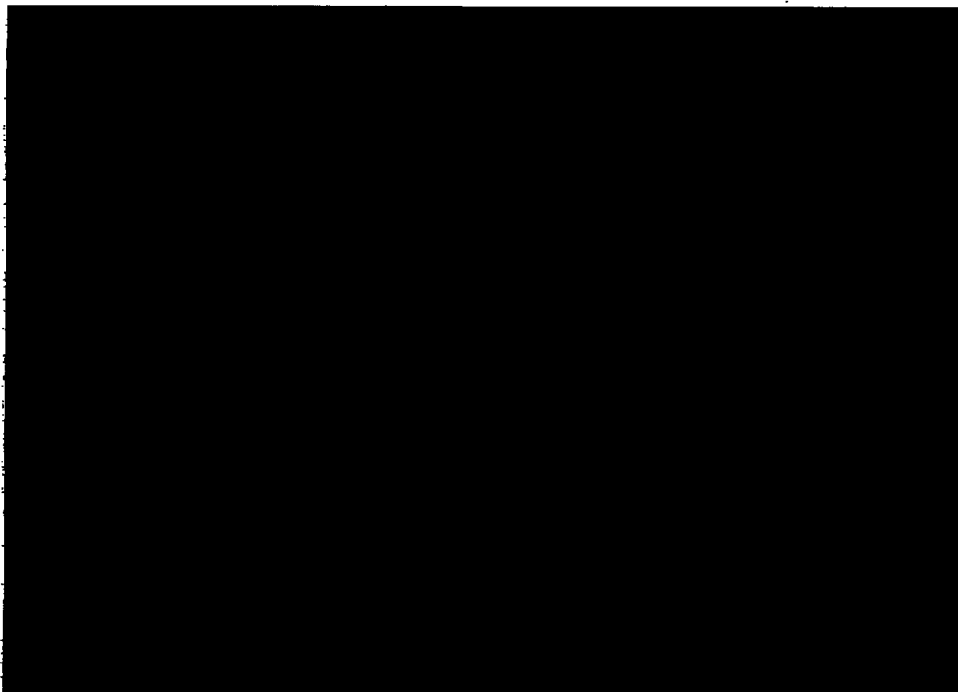
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11 MIKE WEBER: Anything else, Michael?

12 MICHAEL DUDEK: Other than that, the NRCC
13 is standing down. They're going to affect skeleton
14 crew starting at eight o'clock. They'll be having a
15 skeleton crew monitor the situation throughout the
16 weekend.

17 I specifically requested that if they
18 need anything from the NRC. They said, put your name
19 and your number on your monitor, and so we know of a
20 contact information of you, but other than that, we
21 don't need anything from you. So I, I've been given
22 the okay to leave if, if, if and when you guys give me
23 the okay.

24 It's pretty quiet. It's starting to empty
25 out down here. I know there's a turnover briefing at

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1 eight o'clock that I'm going to stay, stay and listen
2 to. But other than that, they weren't anticipating
3 any major actions until Sunday, where one of the
4 senior FEMA representatives goes in front of Meet the
5 Press. So there was going to be a, a flurry of
6 information requests before that.

7 MALE PARTICIPANT: (Off mic).

8 MIKE WEBER: So you're going to put your,
9 the Ops Center and the Ops Center phone number on your
10 monitor?

11 MICHAEL DUDEK: That's correct.

12 MIKE WEBER: Okay. We can assure that we
13 have coverage.

14 MALE PARTICIPANT: So (inaudible) down, or
15 did you've got them?

16 MALE PARTICIPANT: No, I don't.

17 MIKE WEBER: Oh, you don't have them.

18 MALE PARTICIPANT: Well --

19 MALE PARTICIPANT: Well, oh, all right,
20 the Chairman, the Chairman and Josh Baskin got them.

21 MIKE WEBER: Okay, thank you, Michael.
22 Appreciate you heading out there. We'll be in touch.

23 I think he was planning to stay for the
24 eight o'clock call.

25 Do you need to do that, or can you depart

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1 now?

2 MICHAEL DUDEK: It's pretty empty here
3 right now. There may not even be an eight o'clock
4 call, so I'm going to ask a couple more questions and
5 probably head out.

6 MIKE WEBER: Yeah. That sounds good.
7 Thanks, Mike.

8 MICHAEL DUDEK: All right. Thank you very
9 much.

10 MIKE WEBER: And we'll be in touch if we
11 need you to, you know, for a subsequent shift or
12 something, but it doesn't sound like the NRCC's going
13 to be the focal point of the federal response.

14 MICHAEL DUDEK: It doesn't appear so. I
15 mean I'm, I live downtown. I live two blocks away.
16 If you need me to go to DHS or anywhere else, I'm
17 always available.

18 MIKE WEBER: Great. Thank you, Michael.
19 Appreciate it.

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1 (CONFERENCE CALL INITIATED.)

2 MIKE WEBER: Good evening, Chairman.

3 CHAIRMAN JACZKO: Hello?

4 MIKE WEBER: Hello, Chairman. We're here.

5 CHAIRMAN JACZKO: Great. Any -- what's
6 the latest information you have?

7 MIKE WEBER: We have, now, a substantial
8 update from the last time we briefed you.

9 CHAIRMAN JACZKO: Okay. Who all is on
10 now?

11 MIKE WEBER: It's just the Headquarters
12 executive team here.

13 CHAIRMAN JACZKO: Okay.

14 MIKE WEBER: We have Bill Borchardt,
15 Nader, Bill Ruland, Mike Weber, Brian McDermott, Scott
16 Morris, Tim McGinty, and Eric Leeds is standing here,
17 as well as other staff.

18 CHAIRMAN JACZKO: Okay, good. Okay, well,
19 can someone give me a rundown, then, of what our plans
20 are for this evening and then tomorrow?

21 BRIAN McDERMOTT: Yes, sir. We've got --
22 this is Brian McDermott -- we've got folks coming on
23 at 11 p.m. this evening for a, for a second shift.
24 We're planning to have them come over. Dan Dorman
25 will be our representative for the executive team.

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1 Scott Morris will be here with him as the response
2 advisor.

3 The plan that have come in, in time for an
4 11:15 Commissioner Assistants briefing, so we'll keep
5 all the commissioner assistants up to speed at that
6 time, kind of do that as they're during their
7 turnover.

8 CHAIRMAN JACZKO: Is there a reason we're
9 doing that at 11:15?

10 BRIAN McDERMOTT: Because the shift
11 turnover was planned at that point in time, and that
12 would allow the, both the on-coming and off-going
13 leads for the executive team to, to take part in that
14 call.

15 CHAIRMAN JACZKO: Okay, can I, can I just
16 make a suggestion? I, I think right now that -- and
17 I'd be interested in your thoughts on this -- I don't
18 know what we want to interject that into a shift
19 turnover. If, if we need to do a shift turnover, we
20 do a shift turnover and let that -- I mean, we are in
21 monitoring, quasi-monitoring mode. So let's deal with
22 that issue separately.

23 If we need to do a briefing for commission
24 TAs or someone else, let's do that separately so that
25 it doesn't distract from the turnover and the

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1 continuity of our, our monitoring activities.

2 BILL RULAND: Yeah, Chairman, this is
3 Bill. At 11:15 -- the turnover's really going to be
4 done by 11. The idea of 11:15 was just that we would
5 still have both teams there and sort of make sure we
6 had good continuity. So the actual turnover will
7 happen between 10:30 and 11 --

8 CHAIRMAN JACZKO: Okay.

9 BILL RULAND: -- specifically. And before
10 the off-going shift actually gets out to their cars
11 and gets and heads home, we wanted to do the phone
12 call and have that done.

13 CHAIRMAN JACZKO: Okay.

14 BILL RULAND: And so we're planning to do
15 it at 11:15, and also 715. The day shift turnover
16 will happen 6:30 to 7:00.

17 CHAIRMAN JACZKO: Okay. And what do you
18 plan to do to keep me briefed and updated?

19 BILL RULAND: Whatever you want.

20 CHAIRMAN JACZKO: Well, what, what would
21 you recommend?

22 BILL RULAND: Well, I mean, I think we'll
23 just have the EP director probably give you a call as
24 he's, as the off-going shift is getting ready to
25 depart, to give you a call and give you the latest.

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1 So it will be sometime around 11 o'clock tonight
2 unless something more significant happens.

3 CHAIRMAN JACZKO: Okay.

4 BILL RULAND: But we're dying in a sea of
5 silence here actually.

6 CHAIRMAN JACZKO: Yeah.

7 BILL RULAND: There's no real information
8 other than the few occasional press releases coming
9 out.

10 CHAIRMAN JACZKO: And, and let me just to
11 make an attempt to perhaps recalibrate us a little bit
12 here. This -- and I think you all know this -- but
13 this is not our event. And our function and our
14 focus, I think, going forward need to turn a little
15 bit more towards probably a public communication
16 strategy and a public communication effort in the
17 event that something were to go very badly in, in
18 Japan.

19 So I encourage all of you, in the time
20 that you're there, to be working on preparing
21 materials so that, in the event something were to
22 happen, we are prepared when that happens to have good
23 communication about whether something like this could
24 happen in the United States, what our plants are like,
25 how they're comparable, all those kinds of, kinds of

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FJ 2562 of 2725

1 issues.

2 MALE PARTICIPANT: Yeah, actually,
3 Chairman, we've been working here recently and coming
4 up with a list of questions, and we're going to take
5 that and give them to each of the teams that are here
6 and work up draft responses. So we ought to have at
7 least an outline tomorrow morning, and then, you know,
8 we can circulate those around.

9 CHAIRMAN JACZKO: Okay. I encourage
10 you to have that prepared for me by 11. There's a
11 tremendous -- as much as there's a sea of silence for
12 you guys, there's a tremendous vacuum of information
13 within the federal family, and I think it's imperative
14 that we have information early that we can distribute
15 to fill that vacuum.

16 MIKE WEBER: Okay. We'll give it our
17 best. It's one of those things where it will continue
18 to evolve as we develop that information.

19 CHAIRMAN JACZKO: And that, that's fine.
20 As long as we have interim products, in the event we
21 need to use them, we have something ready to go.

22 MALE PARTICIPANT: Okay.

23 CHAIRMAN JACZKO: Make sense?

24 MALE PARTICIPANT: Yes.

25 CHAIRMAN JACZKO: Okay. And again, just

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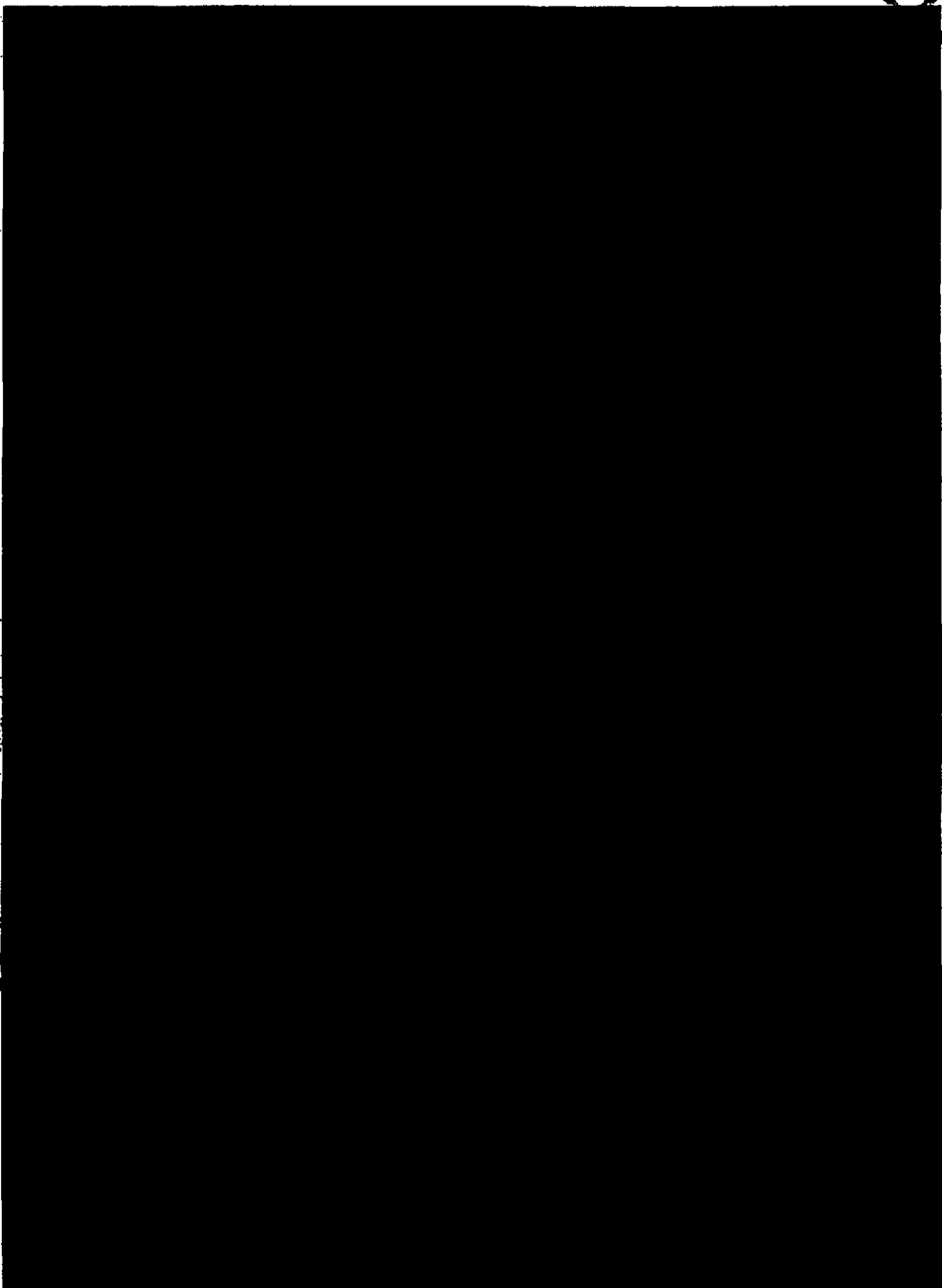
FJ 2563 of 2725

1 to come back to domestically, again, there's no issues
2 at this point that we see with our facilities?

3 MALE PARTICIPANT: That is correct.

4 CHAIRMAN JACZKO: Okay. Okay, good.

5 Anything else that you have for me?
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1 [REDACTED]
2 [REDACTED]
3 And again, I cannot reinforce enough the
4 importance of not speculating and not hypothesizing
5 about what may or may not be happening, and in
6 particular, publicly, so that we just stick to the
7 facts as we know them and do our best to, to stay
8 there.

9 ERIC LEEDS: Okay.

10 CHAIRMAN JACZKO: Anything else that you
11 have?

12 MALE PARTICIPANT: Nothing else on this
13 end, sir.

14 CHAIRMAN JACZKO: Okay. So I'll
15 anticipate, then, a call at approximately 11 unless
16 something were to change dramatically, and then give
17 me a ring earlier.

18 MALE PARTICIPANT: Do you want me to call
19 you earlier, like 10?

20 CHAIRMAN JACZKO: I leave it up to you to
21 do whatever you think is best, the best, the best time
22 within your, within your, you know, your activities.

23 MALE PARTICIPANT: Okay.

24 CHAIRMAN JACZKO: So, sometime, I'll
25 expect a call sometime between 10 or 11, 10 or 11,

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FJ 2565 of 2725

1 again, unless something else changes.

2 MALE PARTICIPANT: I just don't want to
3 inordinately impact on your night.

4 CHAIRMAN JACZKO: No, that's fine. I, I,
5 I'll probably be awake.

6 MALE PARTICIPANT: Okay.

7 CHAIRMAN JACZKO: Okay. Thanks,
8 everybody. I appreciate it.

9 MALE PARTICIPANT: Thank you

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1 (CONFERENCE CALL INITIATED.)

2 CINDY PETERSON: Cindy Peterson here.

3 MALE PARTICIPANT: Yeah, folks, the ANS
4 message went out, and the message should have said
5 that the call would be at 2315 tonight -- that's 11:15
6 tonight -- for the Commissioners' Assistants briefing.

7 CINDY PETERSON: I just got word from my
8 duty officer that there was going to be another call
9 at this time.

10 ANIKA (phon): Hello?

11 MALE PARTICIPANT: There's another call at
12 this time? Let me check with, I'm going to check the
13 bridge. Hold on.

14 SCOTT MORRIS: Ben? Cindy?

15 CINDY PETERSON: Yes?

16 SCOTT MORRIS: Scott Morris here.

17 CINDY PETERSON: Yes, Scott.

18 SCOTT MORRIS: Yeah, there's no other call
19 right now. The next call that's been scheduled was
20 with the commissioners' assistants at 11:15 Eastern.

21 CINDY PETERSON: I was aware of that one,
22 but our duty officer just -- I wonder where he got
23 that message.

24 SCOTT MORRIS: Well, there may be a call,
25 but, but it isn't anything that we are aware of at

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FJ 2567 of 2725

1 Headquarters. It may be some other thing.

2 CINDY PETERSON: Okay. Thank you, Scott.

3 ANIKA: This one at 2315 Eastern time, and
4 that's what the call from him was about. That's what
5 I gather.

6 SCOTT MORRIS: Okay.

7 CINDY PETERSON: What was that, Anika?

8 ANIKA: I said that there was the
9 Commissioner briefing, the phone call at 2315 Eastern.

10 CINDY PETERSON: Right.

11 ANIKA: And that's what the HOO, that's
12 what the calls from the HOO have been about. I just
13 got one.

14 CINDY PETERSON: Did you just get a call
15 from Billy?

16 ANIKA: No.

17 CINDY PETERSON: Okay, I'll call him
18 later. Thanks.

19 ANIKA: Okay. Goodbye.

20 SCOTT MORRIS: This is Scott Morris in the
21 ET room. Do I have one of the HOOs on the line?

22 (No response.)

23 SCOTT MORRIS: Cindy, you're not still
24 there, are you?

25 (No response.)

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1 (CONFERENCE CALL INITIATED.)

2 MARK SATORIUS: I've gotten word from my
3 regional duty officer that there was going to be a
4 brief. Are we just standing by? If we are, I'll just
5 put go back on mute and wait.

6 SCOTT MORRIS: Yes, we just learned that
7 there's going to be a, a call with GE support, General
8 Electric support, and the vice president of Exelon at
9 7:45 to basically share with us what they know about
10 what's going on.

11 MARK SATORIUS: Okay, who's the vice
12 president for Exelon? Just because I probably know
13 him.

14 SCOTT MORRIS: (b)(6)

15 MARK SATORIUS: Okay, yes, know him well.
16 He's currently the site vice president at, at Byron,
17 but he has, he was the site vice president at Quad for
18 about eight or nine years to just give you background.

19 SCOTT MORRIS: He's got a lot of boiler
20 experience then.

21 MARK SATORIUS: Yes, okay. I'm going on
22 mute. Thanks.

23 SCOTT MORRIS: Okay, it should be in the
24 next few.
25

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1 (CONFERENCE CALL INITIATED.)

2 SCOTT MORRIS: Hey, Kevin, is it urgent?
3 We're, we're getting ready to listen in on a
4 conference call, a different conference call here in a
5 minute.

6 KEVIN WILLIAMS: Well, they want to know
7 if somebody from NRC can support them, their DART
8 team, and go to Japan.

9 SCOTT MORRIS: Say that again.

10 KEVIN WILLIAMS: There's a request that
11 the NRC send one person with them to their disaster
12 assistance response team to Japan.

13 MALE PARTICIPANT: Disaster assistance
14 response team.

15 SCOTT MORRIS: Okay, and that's down at
16 Federal Triangle, or where is that?

17 KEVIN WILLIAMS: Well, they're going to --
18 no, no, what they want is somebody to go to Japan.

19 SCOTT MORRIS: Oh, I see. Okay.

20 KEVIN WILLIAMS: And they'd like you to go
21 as soon as possible.

22 SCOTT MORRIS: All right. We'll get, will
23 get back to you, Kevin.

24 KEVIN WILLIAMS: You want me to come back
25 in 20 minutes?

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FJ 2570 of 2725

1 BILL RULAND: They a name as soon as
2 possible or they want to send somebody as soon as
3 possible?

4 KEVIN WILLIAMS: They want to send
5 somebody as soon as possible.

6 BILL RULAND: To do what exactly?

7 KEVIN WILLIAMS: To, to support them on
8 this, this team.

9 BILL RULAND: As a technical advisor or
10 what?

11 KEVIN WILLIAMS: Yeah, yeah. Yeah.

12 BILL RULAND: All right. We'll get back
13 to you.

14

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FJ 2571 of 2725

(CONFERENCE CALL INITIATED.)

PAM COWAN: Yes, this is Pam Cowan from Exelon.

SCOTT MORRIS: Hi, Pam. This is Scott Morris at NRC, and we're in, in the operations center. I have several folks here with me.

PAM COWAN: Okay. Well, why don't we go ahead and do introductions. Why don't we let our folks introduce themselves first, and we'll go ahead.

SCOTT MORRIS: Okay.

PAM COWAN: Okay.

(b)(6): (b)(6), site vice president of Dresden station, is on.

(b)(6). And (b)(6), engineering director at Quad Cities station, is on.

PAM COWAN: Okay, (b)(6).

MALE PARTICIPANT: You're up, Scott.

SCOTT MORRIS: Okay, you've got, here at headquarters, you've got Scott Morris, you've got Mike Weber who's a deputy executive director for operations, you've got Bill Ruland who's heading up our reactor safety team, and a host of other folks that, from just a technical staff.

MALE PARTICIPANT: I think we also have Mark Satorius on, Cindy Peterson --

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FJ 2572 of 2725

1 Is there anybody else from your shop,
2 Mark?

3 MARK SATORIUS: Not that I'm aware of.

4 BILL RULAND: Okay, this is Bill Ruland,
5 and we, we heard through Cindy Peterson -- I guess
6 through the resident staff -- that Exelon was asked to
7 run some scenarios for GE for what's going on at the
8 Japanese nuclear power plant.

9 When we heard that, we asked ourselves
10 that maybe there's some information that you could
11 pass on to us that we don't have. We have high-level
12 information that we've gotten from press releases, and
13 as you're probably well aware, EP, we'll have certain
14 inferences from that.

15 But anyway, so we're, we're looking to, to
16 you, if there's any information that you'd share with
17 us.

18 (b)(6): (b)(6), why don't you go ahead
19 and -- since you kind of, kind of spearheaded this for
20 Exelon, why don't you go ahead and describe what we've
21 been doing and what information we've gotten.

22 (b)(6): Okay. Early this afternoon,
23 I received a call from General Electric, from (b)(6)
24 (b)(6), who's their nuclear vice president,
25 basically, and he asked if we could provide some help

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FJ 2573 of 2725

1 both with operating procedures and severe accident
2 management guidelines for the issue that's occurring
3 in Japan.

4 GE currently is basically trying to staff
5 up around the clock to support them in any way
6 possible. They had 70 GE people on the ground at the
7 plant at the time of the event supporting a refuel
8 outage on one of the other units, and those people had
9 given them some spotty information as they were
10 exiting the facility just before the wave hit.

11 (Whereupon, a joining participant
12 interrupted the telephone conference.)

13 (b)(6): So, so after that phone
14 call, we sent them our QA procedures, which are the,
15 the, the boards, if you will, for the simulator for
16 both the reactor vessel levels, the hundred block, and
17 the containment, the 200 block, for both Dresden and
18 Quad Cities.

19 And the reason that the request of those
20 is that the two plants in question, Fukushima 1 and
21 Fukushima 2 -- I believe I'm pronouncing it correctly
22 -- are very similar to Quad Cities in Dresden. The
23 No. 1 unit is the one that they're having the most
24 trouble with, and it is very similar to Dresden,
25 although about half the thermal power rating.

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FJ 2574 of 2725

1 So they do have an iso-condenser like
2 Dresden has. The Unit 2 is very similar to Quad
3 Cities, and it is 740 megawatts electric, so slightly
4 smaller but similar.

5 They do have a toric, and the concern that
6 they had when they called with the fact that the
7 containment pressure was increasing and the Japanese,
8 it sounded like they were going to have to vent the
9 containment. So GE was trying to prepare to support
10 them in any way possible.

11 What we know from ~~as is~~ that they had no
12 source of off-site power. After approximately an
13 hour, they lost their diesel generators due to the
14 fuel oil storage tanks being ripped from the
15 stanchions that support them, and once the day tanks
16 ran out of fuel, they lost all the diesel. So they
17 were basically on battery power for some period of
18 time. We don't know much more than that as far as
19 parameters go.

20 There was some discussion during our call
21 that they were getting spotty information that the
22 containment was at approximately 80 PSI and, and that
23 they were going to vent.

24 We sent them our severe accident
25 management guidelines also, the SAM G1 and SAM G2,

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FJ 2575 of 2725

1 along with Dresden severe accident management
2 guidelines so they would have all those at GE in case
3 they were asked to support them.

4 They then asked for us to run the
5 simulators at both sites. Dresden was in the middle
6 of a license (audio interference) their exam, so they
7 couldn't run Dresden at the time. So we started the
8 Quad Cities simulator and ran the scenario for about
9 two and a half hours to get some parameters. However,
10 we did not know exactly what the starting conditions
11 were, so we just assumed that they had all their
12 equipment available. And then after approximately an
13 hour on the diesels, we just failed the diesels to see
14 what the containment was going to do.

15 We did not get anything even close to what
16 they got for containment response, so we believe we're
17 missing some vital information from them that, you
18 know, that, what happened or did they have a leak. It
19 would appear to us that, at least on the surface, they
20 would have had to have some kind of leak to have
21 gotten to those kind of containment pressures.

22 And at that point, after the two hours, we
23 froze the simulator and saved the, saved the scenario.

24 And right now, we've got connection with GE. If they
25 need anything through the night, they're going to call

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FJ 2576 of 2725

1 me directly, and then we'll staff the simulator to put
2 in whatever information they give us to run a scenario
3 further to try to assess.

4 That's basically what we know at this
5 point in time.

6 SCOTT MORRIS: This is Scott Morris at NEC
7 Headquarters. The GE support staff that you're
8 interacting with, are these folks here stateside are
9 the people that are over at the site in Japan?

10 (b)(6): They're stateside, from
11 Wilmington.

12 SCOTT MORRIS: Are they in contact? Do
13 they have -- one of the difficulties that we're
14 having, and I imagine it won't come as a surprise, is
15 just getting any kind of reliable information out of
16 the site. And, you know, I was exploring that because
17 I was wondering if that was potentially an opportunity
18 to get some information. So I don't know if GE's been
19 in contact with their staff over there.

20 (b)(6): They talked to their staff,
21 but the problem is that at the facility there, from
22 what they said, the building where they would house
23 all the engineering staff collapsed, and, and
24 basically, the people that left the site are calling
25 them on like either microwave phones or cell phones of

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FJ 2577 of 2725

1 some sort, and they're getting very spotty
2 information.

3 They have nobody at the site that's
4 providing any detailed parameters. They have a
5 translator that, I'll say, looking at every piece or
6 newspaper article and also talking to the people on
7 the ground that they have in the area about what the
8 conditions were prior to leaving the plant. But they
9 don't have any live-time data.

10 SCOTT MORRIS: Okay. Does anybody have
11 any questions?

12 MALE PARTICIPANT: Mark or Cindy, do you
13 guys have any questions?

14 MARK SCOTT: Yes, this is Mark Scott.
15 Yes, I was listening with interest in the support
16 that, that Exelon is providing via their simulators.

17 I don't have any questions right now, no. I don't,
18 Cindy, if she has.

19 SCOTT MORRIS: What I'd like to say on
20 behalf of the NRC, we really do thank you, Exelon
21 making, making yourself available to provide this
22 information. This has been helpful. As you know, the
23 information is sketchy, and each piece fills in the
24 picture.

25 What, the new information we got was about

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FJ 2578 of 2725

1 the fuel oil tanks, and not only the fuel oil tanks,
2 but apparently this engineering building collapsed.
3 So it might be likely that the staff that would help
4 analyze the accident or, or analyze the event that
5 would be helping might have, might have been hurt when
6 that building collapsed.

7 (b)(6): And, and that is also GE's
8 concerned that they don't know if or how many
9 engineers they would have there to assist them with
10 getting either water or power restored in some
11 fashion.

12 SCOTT MORRIS: And, and, and we, of
13 course, you know, in particular if there's somebody
14 from GE listening, you know, we feel, we were
15 concerned, of course, for the staff that you have over
16 there, and I suspect they're very, they're concerned
17 to. And you know, we're thinking about them.

18 (b)(6): I think GE was able to
19 account for a hundred percent of their staff, the 70
20 people that they had there, and none of those people
21 were injured.

22 SCOTT MORRIS: Okay.

23 (b)(6): So they do know that. That,
24 that's about as far as it goes though, from, from at
25 least the conversations we had earlier.

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FJ 2579 of 2725

1 MALE PARTICIPATION: Can I ask a
2 clarification question? Do either one of the
3 isolation condensers, is this thing the high
4 containment pressure nevertheless?

5 (b)(6): That's correct.

6 MALE PARTICIPANT: So it's either water
7 coolant safety relief valve into containment, or --

8 MARK SATORIUS: That shouldn't -- this is
9 Mark Satorius. That shouldn't happen. If they're
10 getting containment pressure increases, there's got to
11 be in RCF leak, I believe.

12 (b)(6): Well, I mean, there's some
13 conflicting information. And the other thing to keep
14 in mind is if your iso-condenser doesn't have make-up,
15 it loses its effectiveness within about a half-hour.

16 MARK SATORIUS: Right. It loses its
17 natural circulation drive if it doesn't have make-up.

18 (b)(6): Right. So, you know, we did
19 ask if they could give us some specific parameters, we
20 might be better suited to help them. So, if we get
21 any more data, how should we get hold of the NRC?

22 SCOTT MORRIS: Just call. What you do is
23 you call into the Headquarters Operations Officer and
24 just say you want to speak to the reactor safety team.

25 (b)(6): Reactor safety team, okay.

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FJ 2580 of 2725

1 The next other thing -- we did, you know,
2 provide a suggestion that if they have any sort of
3 contingencies like we have for B5B regulations, that
4 would be probably the most effective use of resources
5 at this time.

6 So if we get any more information, we'll
7 get a hold of, you know, any more specific data, we'll
8 get a hold of somebody at the reactor safety team.

9 SCOTT MORRIS: That's great, and we're
10 staffed, we're going to be staffed 24/7.

11 (b)(6): They they did say that the
12 wave at the plant location was like 35 feet when it
13 hit.

14 (b)(6): And I, what I didn't know
15 about -- a couple of the things you might, I don't
16 know whether you know or not, all of the facilities at
17 the Japanese plants, everything is above grade.
18 There's nothing buried, and that's why the tanks got
19 broken off because they're actually aboveground. And
20 the other thing is they don't have event-specific
21 EOPs. They never transitioned to the symptom-specific
22 EOPs. So that's one of the reasons they wanted our
23 EOPs and our severe accident management guidelines, is
24 for addressing the symptoms instead of trying to
25 follow the vent procedure.

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1 MALE PARTICIPANT: When you said the
2 entire unit's above grade, that includes the ECCS pump
3 rooms and all that?

4 (b)(6): Well, those may be -- what I
5 mean, it's like, there's no buried tanks or piping.

6 MALE PARTICIPANT: Okay. Okay. It's
7 rock.

8 MALE PARTICIPANT: So basically, a wave, a
9 35-foot wave would do, wreak some havoc with all that
10 aboveground stuff.

11 (b)(6): Exactly.

12 MALE PARTICIPANT: So, either one of the
13 isolation condensers, do you know if they were able to
14 provide long-term cooling make-up to the shell side?

15 (b)(6): We didn't get that
16 information. The last information I saw on a press
17 release was that they had some kind of make-up, but it
18 wasn't a term that I was used to. But, you know, that
19 was my concern, that the iso-condenser works fine if
20 you have, have a make-up source. But it appeared to
21 me that they had no capability of making it up to the
22 shell.

23 SCOTT MORRIS: I think we, we got the
24 information we needed.

25 MALE PARTICIPANT: Yeah.

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FJ 2582 of 2725

1 SCOTT MORRIS: So I, if you get anything
2 new, just give us a, a call at the Ops Center and ask
3 for the reactor safety team.

4 (b)(6): Okay.

5 SCOTT MORRIS: We really appreciate it.
6 Thank you.

7 PAM COWAN : Thank you.

8 (Whereupon, several participants
9 disconnected.)

10 MARK SATORIUS: Hey, Scott?

11 SCOTT MORRIS: Yes?

12 MARK SATORIUS: Or Bill Ruland?

13 BILL RULAND: Yes, Mark.

14 MARK SATORIUS: Yeah, it's Mark Satorius.

15 Did Mark Ring join the bridge?

16 BILL RULAND: No.

17 MARK RING: Yes, I did, Mark Satorius.

18 MARK SATORIUS: Okay. Mark Ring is
19 probably as knowledgeable -- he's the branch chief for
20 both Quad and Dresden. He's as knowledgeable as you
21 can get on issues such as make-up for the iso-
22 condenser and things like that. If you would like to
23 ask him how Dresden works, he can help you.

24 SCOTT MORRIS: Yeah, just tell him to call
25 -- if you could -- tell him to call and just give us

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FJ 2583 of 2725

1 his cell phone number.

2 MARK SATORIUS: Who's that? Mark Ring?

3 SCOTT MORRIS: Yeah.

4 MARK SATORIUS: He's, he's on the bridge.

5 MARK RING: I'm on now.

6 SCOTT MORRIS: Well, what's your cell
7 number?

8 MARK RING: (b)(6).

9 MALE PARTICIPANT: Have him call the Ops
10 Center and put him on the --

11 SCOTT MORRIS: Right. Right. Right.
12 Right.

13 Mark, if you wouldn't mind, can you just
14 call back to the Ops Center and ask to be put on with
15 the reactor safety team?

16 MARK RING: Sure.

17 SCOTT MORRIS: That'd be great.

18 MARK RING: Yes.

19 SCOTT MORRIS: Anything else?

20 (No response.)

21 SCOTT MORRIS: Thank you.

22 MARK SATORIUS: Hey, Scott?

23 SCOTT MORRIS: Yes.

24 MARK SATORIUS: Just before you go, as you
25 develop names for who might be the correct person or

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FJ 2584 of 2725

1 the most useful person to provide, if there's going to
2 be a team sent to Japan, give me a call because Mark
3 ring is one, and either the senior resident at Quad or
4 the senior resident at Dresden might be an option as
5 well.

6 SCOTT MORRIS: Okay. All right, Mark.
7 Thank you.

8 MARK SATORIUS: All right. I'm going to
9 drop off.

10 Hey, Scott, is there still going to be a
11 briefing at 10:15?

12 SCOTT MORRIS: I believe it's at, there's
13 going to be a commissioner assistants, yes, your time.

14 MARK SATORIUS: Yeah, and 11:15 yours,
15 okay.

16 SCOTT MORRIS: Yeah.

17 MARK SATORIUS: Thank you. Okay, dropping
18 off.

19 PAM COWAN: Hey, Scott?

20 SCOTT MORRIS: Yes, ma'am.

21 PAM COWAN: This is Pam. Hey, I was
22 curious, did you say you were sending a team to Japan?

23 SCOTT MORRIS: I don't think that
24 decision's been made yet. I don't know that we've
25 gotten any sort of formal request for that.

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FJ 2585 of 2725

1 PAM COWAN: Okay.

2 SCOTT MORRIS: In fact, I know we haven't
3 gotten a formal request that yet. That's something
4 that we have, we have, we have staff at various
5 federal agencies around the city, and collectively,
6 the federal government is trying to figure out what's
7 the proper way to respond and support. And we'll
8 obviously be part of that, but at this point, it's not
9 clear.

10 PAM COWAN: Okay. All right, so we'll
11 just keep you up to date if we get any new substantive
12 new information comes about.

13 SCOTT MORRIS: All right, Pam. Thank you
14 very much.
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1 (CONFERENCE CALL INITIATED.)

2 TOM D'AGOSTINO: I think we can just get
3 the job done across the board and answer any
4 questions.

5 We had an opportunity to talk to General
6 Cartwright again after the meeting earlier this
7 evening, and what we found out -- he an opportunity to
8 talk to something

9
10 (b)(5)

11 they were okay.

12 They're very comfortable with where they
13 were on aerial measurement. And so they did not need
14 her aerial monitoring system. So were standing down.

15 I mean, we are not completely standing down but we're
16 not going to be shipping off something tomorrow. I
17 just wanted you to know that.

18 CHAIRMAN JACZKO: Thank you.

19 TOM D'AGOSTINO: But the other thing he
20 said, which was quite interesting, is his Chief of
21 Defense said they did need, and I think the term was
22 "engineering assistance," and if they could get
23 engineering assistance from the United States, that
24 would be good. And Cartwright told him, well, Energy
25 and the Nuclear Regulatory Commission are the right

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FJ 2587 of 2725

1 place for that assistance.

2 What they ended up agreeing to was that
3 the Government of Japan would officially put the
4 request through the Ambassador, which of course is the
5 right channel, officially through the Ambassador, and
6 that the Ambassador would have, would obviously get
7 some specific information and would be in the position
8 of channeling that to the right, to the right U.S.
9 government organization to provide the engineering
10 assistance that they're requesting.

11 We told General Canine that, you know,
12 we -- in the Department of Energy, as you note Gregg,
13 we do energy research -- obviously, we work with the
14 NRC. We don't do a lot of civil programs. You all
15 have the experts that understand BWRs and PWRs and
16 have done accident analysis and the like.

17 But at the same time, we want to make sure
18 that, you know, you know, one, that the Ambassador
19 understands, understands that and that, should the
20 Government of Japan put in an official request for
21 engineering assistance, that it's very important that
22 it gets to the NRC, for sure, and to DOE as well, but
23 probably the NRC, I mean, my guess is, has the more
24 up-to-date accident analysis on the civil power plants
25 out there.

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FJ 2588 of 2725

1 So we all, so that's kind of -- Steve, I'm
2 going to ask Steve if I think you could add anything
3 to what I've just said before we open it up for
4 questions.

5 STEVE AOKI: I guess the only other thing
6 that we thought is, at some point, if they really are
7 looking for engineering support, that we probably do
8 have to have a line out to GE, but we haven't done
9 anything on that front yet. On that front yet.

10 CHAIRMAN JACZKO: Hey, Tom, I'm Scott
11 Morris answer, but I think we're slightly ahead of
12 that, so --

13 TOM D'AGOSTINO: Oh, good.

14 CHAIRMAN JACZKO: So we'll be ready to
15 provide resources.

16 And Scott, maybe you can fill, fill him in
17 on where we are with GE.

18 SCOTT MORRIS: Well, we just -- yes, this
19 is Scott Morris. We, just within the last hour, had a
20 conversation with, not with GE but rather with Exelon,
21 which, as you know, has a large fleet of reactors.
22 They were actually contacted today by GE support and
23 asked them for a bunch of their emergency operating
24 procedures, severe accident management guidelines,
25 they asked them to run some simulator scenarios and

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1 try to assess, you know, try to look forward a little
2 bit and see, you know, how much time they may have for
3 various things.

4 So they, they've been in close contact
5 with GE. We have not been, directly. We did learn a
6 couple of things about what had occurred at the site
7 because, because apparently General Electric has
8 approximately 70 of their staff at that site. So --

9 CHAIRMAN JACZKO: Well, Tom, we'll, we'll
10 make sure to reach out to GE and, and so if we do get
11 the request in, we'll have our people available and
12 we'll make sure that we have a contact for GE that
13 they can, that they can come to.

14 TOM D'AGOSTINO: Okay.

15 CHAIRMAN JACZKO: Does that make sense?

16 TOM D'AGOSTINO: Yeah, absolutely



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23 TOM D'AGOSTINO: Okay, great. That sounds
24 good. That would be, that would be awesome.

25 CHAIRMAN JACZKO: Okay, good.

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1 TOM D'AGOSTINO: Okay, good. Now, I, I've
2 just been notified, Michele Flournoy (phon) wants to
3 talk to me urgently. Has she, has she talked to you,
4 Greg?

5 CHAIRMAN JACZKO: No, she's not talked to
6 me but I think our teams are in touch. Our technical
7 folks, I think, are talking with some of the modeling
8 folks.

9 TOM D'AGOSTINO: Okay. Okay, yeah,
10 definitely on the modeling side for sure.

11 CHAIRMAN JACZKO: Yes.

12 TOM D'AGOSTINO: Okay. Well, thank you.
13 I wanted to make sure you had that about the
14 engineers, engineering assistance. Okay, good.

15 CHAIRMAN JACZKO: We'll get a hold of
16 Michele, then, here shortly on another item.

17 TOM D'AGOSTINO: All right, great. Thank
18 you.

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1 (CONFERENCE CALL INITIATED.)

2 SCOTT MORRIS: Josh?

3 JOSH BASKIN: Yes, sir?

4 SCOTT MORRIS: Hey, Scott Morris and Mike
5 Weber.

6 JOSH BASKIN: Hello, gentlemen.

7 MIKE WEBER: Hello, Josh.

8 JOSH BASKIN: How are you?

9 MIKE WEBER: Good. How are you?

10 JOSH BASKIN: The Chairman's still there.
11 He's probably just going to come down and join you
12 for when you're ready to brief him and then probably
13 head home to try and get some sleep for a little bit.

14 MIKE WEBER: Okay.

15 JOSH BASKIN: What time would you want to
16 do that? Does 10:30-ish work for you, or what, what
17 do you think?

18 MIKE WEBER: Yeah, that works.

19 JOSH BASKIN: Okay, so I'll ask him to do
20 that, come down around 10:30.

21 MIKE WEBER: Okay.

22 JOSH BASKIN: And then we'll probably pack
23 him patch in Elliott and maybe Becky as well if that
24 works. I think they have staff in the Ops Center, so
25 that might be sufficient, but they might jump on too.

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1 MIKE WEBER: Okay.

2 JOSH BASKIN: All right, great. And then
3 I will join also on the 11:15. And if, if there are
4 any questions that show that the participants don't
5 know quite understand where we are, I'll, I might jump
6 in . . .

7 SCOTT MORRIS: Okay.

8 JOSH BASKIN: If that makes sense.

9 SCOTT MORRIS: That makes sense.

10 JOSH BASKIN: Great. Okay, I will ask him
11 to come join you at about 10:30 then.

12 MIKE WEBER: Okay.

13 JOSH BASKIN: Thank you.

14 SCOTT MORRIS: Thank you, Josh.

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1 (CONFERENCE CALL INITIATED.)

2 SCOTT MORRIS: The nuclear story's getting
3 more and more attention on the networks. They haven't
4 made the jump yet to what happens if this occurs in
5 the United States.

6 CHAIRMAN JACZKO: Okay.

7 SCOTT MORRIS: So, what are plants like?

8 Our staff are outside the ops center
9 getting increasingly concerned about, where is NRC
10 communicating all the (inaudible) And we've had a
11 number of urges for, hey, let's be more proactive.

12 CHAIRMAN JACZKO: Yeah.

13 SCOTT MORRIS: And we've not done that.

14 We did get language from the White House,
15 but I would --

16 MALE PARTICIPANT: Okay.

17 MALE PARTICIPANT: Yes, I did.

18 SCOTT MORRIS: So it's basically, we're
19 not taking a position we are working with the
20 Japanese.

21 CHAIRMAN JACZKO: Okay.

22 SCOTT MORRIS: And, but we still have
23 developed the Qs and As. And we just took a look at
24 those draft questions and answers, and they're off
25 making some tweaks to those.

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1 CHAIRMAN JACZKO: Okay.

2 SCOTT MORRIS: It's about three pages.

3 CHAIRMAN JACZKO: Okay.

4 MALE PARTICIPANT: Questions and answers -
5 - they're structured so that there's a public
6 response, and then there's a more detailed technical
7 response so, as you're using them, you have something
8 to draw from.

9 CHAIRMAN JACZKO: Right.

10 SCOTT MORRIS: You probably would not want
11 to speak on the technical right way.

12 CHAIRMAN JACZKO: Yeah, okay.

13 SCOTT MORRIS: In terms of --

14 CHAIRMAN JACZKO: Let me ask you, do you
15 think we should be communicating more?

16 SCOTT MORRIS: Um, I think, given that
17 it's a foreign incident, we should not be
18 communicating.

19 CHAIRMAN JACZKO: Okay.

20 SCOTT MORRIS: But I think we need to be
21 ready to communicate when they make that jump to, what
22 are the --

23 CHAIRMAN JACZKO: To the US.

24 SCOTT MORRIS: -- what are the US plants
25 designed to --

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1 CHAIRMAN JACZKO: They're designed to --

2 SCOTT MORRIS: If there is a release, is
3 that going to impact the United States. And that's
4 the kind of questions and answers that we had
5 developed. But it's so unlike NRC in terms of our
6 communication --

7 MARGIE: (Off mic.)

8 SCOTT MORRIS: Okay, I got that. Thank
9 you.

10 CHAIRMAN JACZKO: It feels funny.

11 SCOTT MORRIS: Because we're in a battle
12 rhythm to communicate, you know, share with the
13 public, be open, let them know what we're thinking,
14 what we're doing. I mean --

15 CHAIRMAN JACZKO: Yeah.

16 SCOTT MORRIS: -- it's not our role in
17 this case.

18 CHAIRMAN JACZKO: Yeah.

19 SCOTT MORRIS: But it will become when
20 they shift their focus to the United States.

21 CHAIRMAN JACZKO: Okay. So should we go
22 through the latest status, and then --

23 SCOTT MORRIS: Sure. Sure.

24 CHAIRMAN JACZKO: -- a couple questions
25 then.

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1 SCOTT MORRIS: Sure.

2 CHAIRMAN JACZKO: An overview?

3 MALE PARTICIPANT: Unfortunately, there
4 hasn't been a lot of technical information that we've
5 gotten.

6 CHAIRMAN JACZKO: Oh, yeah?

7 MALE PARTICIPANT: -- from any any
8 channels other than what we're getting from news media
9 outlets and the occasional press release, and they've
10 actually been kind of few and far between.

11 SCOTT MORRIS: There has been some
12 increased attention at the B-1 reactor.

13 (Whereupon, the parties made off-mic
14 comments on the record.)

15 SCOTT MORRIS: So we're trying to track
16 that down. We know that precautionary evacuations
17 were previously ordered for the unit, but we don't
18 have -- unless Margie has some new information.

19 MARGIE: No.

20 SCOTT MORRIS: We don't have any
21 information about the plant status of the plant, so if
22 there is something going on there, you know, that's
23 news to us.

24 CHAIRMAN JACZKO: Okay.

25 SCOTT MORRIS: We are reaching back

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1 through our Japanese counterparts a bit.

2 MALE PARTICIPANT: The best technical
3 information we've gotten actually came through out,
4 that call we had with Exelon, where we learned what
5 some of the damage, basically, the reason behind why
6 the diesel ran for a little while and then stopped
7 running.

8 The reactor safety guys are on the phone
9 with GE right now.

10 CHAIRMAN JACZKO: Okay.

11 MALE PARTICIPANT: And the, the real
12 headline out of that phone call is that GE's folks
13 down in Wilmington have had zero contact with their
14 people over there. They know that they're safe and
15 they weren't, I think they were off site or something.

16 But they really have no input from them at all about
17 the status of the facility. So it's frustrating.

18 And, of course, there's been a lot of
19 folks speculating. I mean, (inaudible) was on and a
20 handful of, you know, professors from around the
21 country, but --

22 CHAIRMAN JACZKO: Peggy, is Elliott on?

23 PEGGY: No, I'm not sure he knew about the
24 10:30. He knew about the 11:15.

25 CHAIRMAN JACZKO: Okay.

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1 Elliott, are you on?

2 ELLIOTT: Yes. Yes, I am. I, I had a
3 little difficulty connecting.

4 CHAIRMAN JACZKO: Is there any value in us
5 even putting out something that just says, you know,
6 people shouldn't be speculating, or we're not
7 speculating?

8 ELLIOTT: Here's, there's a lot of
9 feedback here.

10 The, the only issue I have is that events
11 over there are unfolding so quickly.

12 CHAIRMAN JACZKO: Okay.

13 ELLIOTT: It could reach conclusion by the
14 time I put something out.

15 CHAIRMAN JACZKO: Okay. Okay.

16 MALE PARTICIPANT: You know, I guess to
17 put a final thought on that, they've already had Matt
18 Walls (phon) on, so they've got --

19 CHAIRMAN JACZKO: Can we, can we
20 (inaudible) one conversation here?

21 MALE PARTICIPANT: They've already had
22 one; I mean they've already had one reporter
23 interviewing another one right now.

24 CHAIRMAN JACZKO: Right.

25 MALE PARTICIPANT: So there is obvious

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1 lack of factual information. You know, so --

2 CHAIRMAN JACZKO: So, from a technical
3 standpoint, we don't know too much more than we did
4 two or three hours ago.

5 MALE PARTICIPANT: (Inaudible).

6 CHAIRMAN JACZKO: And so summarize for me
7 what you think the technical situation to be.

8 MALE PARTICIPANT: Well, we actually --

9 MALE PARTICIPANT: We have Bill's --

10 (Simultaneous conversation)

11 BILL RULAND: Chairman, we actually were
12 on the phone right now with General Electric.

13 CHAIRMAN JACZKO: Okay.

14 BILL RULAND: General Electric has been
15 basically getting the information off the wire that we
16 have, but they've been using the simulator, the
17 Dresden and Quad simulators, to try to tease out the
18 information.

19 CHAIRMAN JACZKO: I'm sorry, can I just,
20 before you go on, can I just double back? We had an
21 earlier call that indicated we would get a request for
22 assistance. Did that ever --

23 PEGGY: You mean with USAID?

24 SCOTT MORRIS: No. No, this is from the
25 Ambassador of Japan.

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1 CHAIRMAN JACZKO: If we do get that
2 request, did get that request, did we identify a GE
3 point of the contact for them?

4 SCOTT MORRIS: Well, we were talking with
5 them --

6 BILL RULAND: We were talking to them
7 right now.

8 CHAIRMAN JACZKO: So, if we get a request
9 from the Japanese for technical assistance, we have
10 someone here we can provide and we have a contact?

11 SCOTT MORRIS: Yes, sir.

12 CHAIRMAN JACZKO: Okay.

13 MALE PARTICIPANT: And it turns out nobody
14 from TEPCO has talked to GE.

15 CHAIRMAN JACZKO: Okay. And have we
16 reached out to NISA again?

17 MARGIE: Okay, I put you on the email
18 because Kirk (inaudible).

19 CHAIRMAN JACZKO: Okay.

20 MARGIE: We reached out to (inaudible) and
21 NISA, and (inaudible) sent her here.

22 CHAIRMAN JACZKO: Okay.

23 MARGIE: -- have somebody within hours.

24 CHAIRMAN JACZKO: Okay, that's --

25 MARGIE: Because what Kirk is going to

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1 need is -- someone in, a contact of his says we he
2 will be giving you the recent (inaudible), but he
3 hasn't gotten it yet.

4 CHAIRMAN JACZKO: Okay.

5 MARGIE: You can be monitoring it on the
6 email and you'll get something from Kirk.

7 CHAIRMAN JACZKO: Okay.

8 MALE PARTICIPANT: What we did, Andrea, we
9 reached both directions to kind of prime the pump.
10 But we have not received a formal (inaudible).

11 CHAIRMAN JACZKO: Okay.

12 MARGIE: (Inaudible) just in case you get
13 something (inaudible). You're going to be getting
14 stuff from all kinds of people. We've been getting
15 stuff from all kinds of people. (Inaudible) break it
16 up.

17 (Audio interference.)

18 SCOTT MORRIS: Do you want Bill to --

19 CHAIRMAN JACZKO: Yes.

20 SCOTT MORRIS: Okay, good. He's here.

21 BILL RULAND: Basically, the information
22 continues to be sparse. But just to reiterate, we --
23 and GE confirmed our view of what they have been
24 seeing. They did a simulator run --

25 CHAIRMAN JACZKO: Summarize for me what

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1 that is.

2 BILL RULAND: And -- basically that, you
3 know (inaudible) all the plants. Three of the plans
4 are, you know, have loss of off-site power; haven't
5 been able to restore any AC power. Their simulator
6 run, they predicted that Unit 1 would be about two and
7 a half to three PSIG. After three hours, instead,
8 they were at about 80 pounds in the containment, which
9 indicates to them and us that there's some sort of a
10 leak, you know, a loss-of-coolant accident at the
11 plant. And it looks like that plant is the worst.

12 CHAIRMAN JACZKO: You know already that
13 they've already entered that phase?

14 BILL RULAND: We checked the INES scale,
15 and they're at least at a Level III, which is a
16 serious incident. And the only reason we don't think
17 there are any more is we have sparse information.
18 They, I think I told you that the reason the diesel
19 failed is that all the diesel tanks were all above,
20 the fuel tanks were all above ground, and the tsunami
21 ripped the fuel tanks off, off their foundation.

22 GE said GE has like 70 people on site, but
23 they're now off-site. They were undermanaged.

24 But as far as we can tell, it continues to
25 proceed like we had thought. You know, our initial

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1 estimate is, if the worst plant, we start seeing any
2 damage, the earliest possible to see that damage would
3 be probably about midnight.

4 CHAIRMAN JACZKO: And that was Unit 2;
5 right?

6 BILL RULAND: Right.

7 ELLIOTT: And you mentioned three plants.

8 BILL RULAND: Right. Right. Not only
9 three plants, it -- and we just heard from GE that
10 apparently --

11 CHAIRMAN JACZKO: By "three plants," the
12 three units.

13 ELLIOTT: -- three units. Three units --
14 apparently, we heard from GE that there was an initial
15 earthquake at about two o'clock Eastern time, and that
16 additional earthquake caused the plant on the other
17 side of the island a loss of power, and the entire,
18 that entire island is completely dark. . .

19 CHAIRMAN JACZKO: Really?

20 BILL RULAND: Yes. And that's what,
21 that's what he just --

22 MALE PARTICIPANT: That's what he said.

23 BILL RULAND: And this is, you know, this
24 is secondhand, unverified, but they, GE has people on
25 the ground in Japan.

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1 CHAIRMAN JACZKO: Can we work to get that
2 confirmed and try and share that with the inter-agency
3 community?

4 BILL RULAND: So anyway, that's what we
5 heard. But as, as we said before, the same scenario,
6 you know, appears to us that there's been no
7 intervening actions or evidence that would say that
8 they're not proceeding down that path. But it's,
9 again, this is strictly, you know, gleaned from wire
10 service reports.

11 You know, what troubles us a little bit is
12 that TEPCO is not talking to GE. You know, GE's not
13 getting any information other than what we're getting.

14 ELLIOTT: There's been no news, related
15 news coverage of "radioactive steaming releases" from
16 -- but again, that's just --

17 BILL RULAND: Right.

18 ELLIOT: But again, that's just, I don't
19 know valid --

20 BILL RULAND: And, and that was, that's
21 the last report we saw was it was a thousand times
22 greater than background, which is consistent --

23 MALE PARTICIPANT: In the control room?

24 BILL RULAND: -- right -- which is
25 consistent with venting containment but not core

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1 damage.

2 CHAIRMAN JACZKO: Did we have these -- can
3 you put these in a piece of paper for me, all of
4 these facts?

5 BILL RULAND: Sure. We, we, we have, we
6 have the briefing sheet that Tony used, and we'll see
7 if we can, we need to update that.

8 CHAIRMAN JACZKO: Yeah. And I want to
9 emphasize this. I think this is fundamentally a
10 communication error.

11 MALE PARTICIPANT: Yes, Sir.

12 CHAIRMAN JACZKO: So it's important, when
13 we have information, to get it done into paper as
14 possible for two reasons. One, it allows us to have a
15 reference for what information we know and we don't
16 know, and it allows us to share that information as
17 immediately as possible.

18 BILL RULAND: We can really make a point
19 of doing that. As a matter of fact, we've been
20 organizing our press releases and, and that data.

21 CHAIRMAN JACZKO: Okay, good.

22 MALE PARTICIPANT: Can I go?

23 MALE PARTICIPANT: Yes, please.

24 CHAIRMAN JACZKO: Yes.. If you can get
25 back to me -- and again, with all the information we

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1 have, let's make sure we've kind of resourced it, so
2 we indicate what the source of it is and --

3 (Simultaneous conversation.)

4 MALE PARTICIPANT: -- the previous sheet
5 we had, just, you know, all the press releases.

6 CHAIRMAN JACZKO: Okay. Good. Thank you.

7 (Simultaneous conversation.)

8 MARGIE: I'm sorry -- we (inaudible) about
9 doing something similar. So it's read it out, and
10 think about something similar and give it to a contact
11 in TV and just say, we're working on this, people are
12 working on this for you, and (inaudible).

13 CHAIRMAN JACZKO: Let's try to do that.
14 Let's do that.

15 MARGIE: (Inaudible) TEPCO. I can try --

16 SCOTT MORRIS: They should work through
17 regulator.

18 MARGIE: -- okay.

19 SCOTT MORRIS: All right.

20 Yeah, Ruland, go ahead?

21 BILL RULAND: Yeah, the other thing I was
22 going to mention was that, with respect to providing
23 engineering assistance --

24 CHAIRMAN JACZKO: Yeah.

25 BILL RULAND: -- we've identified an

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1 individual who's ready to go.

2 CHAIRMAN JACZKO: Okay.

3 BILL RULAND: It turns out that military
4 flights, but I guess all commercial flights in and out
5 of Japan --

6 SCOTT MORRIS: I think Mark is going to --
7 are you going to talk to that?

8 MARGIE: Okay. Okay, so let's just go to
9 it so I don't forget.

10 Okay, so we (inaudible) come to my email
11 as well.

12 Jim Trapp is the, he has experience from
13 Dresden, so there's competence. We sat down with him
14 and briefed him on Japan. He seems like a very like
15 he's very focused internationally. The one concern I
16 have is that he's going into a rural area and don't
17 speak too much Japanese. (Inaudible). We've done
18 that with Kirk, but the USAID team.

19 What we typically do is they're going, all
20 of the team, we put the individual, the (inaudible)
21 individuals would get together with a (inaudible),
22 everything that they're doing, take advantage of what
23 they're getting from (inaudible). It turns out that
24 there's a military flight, but it's leaving too early.

25 CHAIRMAN JACZKO: Okay, we've got to get

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1 somebody off the team --

2 MARGIE: It's leaving in an hour. They
3 didn't tell us that, so --

4 CHAIRMAN JACZKO: Okay, well, we need to
5 get somebody on that.

6 MARGIE: Well, what they want to do is
7 they want to fly into Narita.

8 MALE PARTICIPANT: Tomorrow morning

9 MARGIE: That's what USAID wants to do is
10 fly --

11 CHAIRMAN JACZKO: We don't have anyone we
12 can get on an earlier flight.

13 MARGIE: Sir, it's leaving in an hour.
14 They, they didn't, neither called --

15 CHAIRMAN JACZKO: Let's, let's double back
16 and say we can't get somebody on there.

17 MARGIE: I don't know --

18 CHAIRMAN JACZKO: 11:30, that's all?

19 MALE PARTICIPANT: That's 45 minutes.

20 MARGIE: They just told me 15 minutes ago.

21 MALE PARTICIPANT: Half an hour to
22 anywhere.

23 CHAIRMAN JACZKO: Okay, you have to solve
24 it. I'd like to run that into the ground and make
25 sure that we don't miss an opportunity to get somebody

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1 out there earlier. If it's not the best person, we
2 run that and we, we'll, yeah, we'll get the person on
3 AID flight later, but we'll --

4 MARGIE: No, no, no --

5 CHAIRMAN JACZKO: But let's get somebody --

6 -

7 MALE PARTICIPANT: He's not, not from
8 here, but we have --

9 MARGIE: They need a current passport.
10 They can't get onto the country without a passport,
11 and that, I can't make happen.

12 MALE PARTICIPANT: Right.

13 (Simultaneous off-mic conversation.)

14 MALE PARTICIPANT: We can run down reactor
15 safety team members. They have the whole -- just give
16 call --

17 MALE PARTICIPANT: We have an hour, less
18 than an hour, 45 minutes.

19 MARGIE: Can you, can you please ask
20 (inaudible) to call Kevin and see --

21 MALE PARTICIPANT: We lift off from Dulles
22 at 11:30.

23 CHAIRMAN JACZKO: Okay, so you'll work on
24 that. If we can't find somebody, we can't, but let's
25 not -- yeah.

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1 MARGIE: Okay. All right. And we know
2 there is --

3 MALE PARTICIPANT: But there is a
4 commercial flight tomorrow.

5 MARGIE: There is. There is, there's some
6 place in Korea and what we're working on that now is
7 getting him hooked up with the team.

8 I absolutely agree with you. I just
9 wanted to go separate, and they didn't tell us it was
10 leaving 11 (inaudible) tomorrow morning.

11 CHAIRMAN JACZKO: Right.

12 MARGIE: Okay. This is the (inaudible).

13 CHAIRMAN JACZKO: Sure.

14 MARGIE: With working with other
15 countries, what we had decided early on is that we
16 would not give other countries anything that we were
17 analyzing based on hypothesis -- that's my word for it
18 -- so we decided, because that wouldn't be a good
19 idea. They'd say (inaudible) said, whatever.

20 Okay, so we have the Russians on the
21 ground. We didn't share much; only what was public.

22 IRSN has recently called. That's a
23 technical organization. And I said you are not to go
24 (inaudible). But we've asked them to call our number.
25 What they're comfortable with, which I think is okay,

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1 is just giving them the specific information that's
2 been confirmed, not our analysis.

3 CHAIRMAN JACZKO: Okay. Yeah, that's
4 fine. No problem then.

5 MALE PARTICIPANT: Bill Ruland
6 (inaudible).

7 CHAIRMAN JACZKO: [REDACTED]
8 [REDACTED]
9 [REDACTED]

10 [REDACTED] Let's put it this way. By the
11 time this other plane will get off the ground in the
12 morning, Bill is there.

13 MALE PARTICIPANT: But it's not our event.

14 MARGIE: It's still (inaudible) hooking
15 them up. I've got two people working on that right
16 now (audio interference) get somebody on the team who
17 really has --

18 BILL RULAND: Well, what's the viability
19 of asking DOD to or whoever to wait an hour --

20 MARGIE: I did. I said, you can go
21 tomorrow morning; wait.

22 BILL RULAND: -- we're not, we're not
23 going to wait.

24 CHAIRMAN JACZKO: So let me get -- do you,
25 do you think it's worth grabbing the first plane?

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1 BILL RULAND: If the view is you need
2 somebody on the team and the only way to get them
3 there is to be with the initial team. I wouldn't send
4 Jack Ramsay because (audio interference).

5 CHAIRMAN JACZKO: So what's your, what's
6 your thought? Do you think you're more valuable
7 getting on a plane and going to Japan or staying here?

8 BILL RULAND: Well, it's either Tony Ulises
9 or myself. Both have, I have a (audio interference) -
10 - taking my official passport.

11 MARGIE: By official you (inaudible)
12 personal because it's --

13 BILL RULAND: No, not with me. I think
14 Tony Ulises might have an official passport -- I mean
15 he might have a personal.

16 Let me, let me go check. Tony Ulises might
17 have a personal passport with him. Let me see.

18 MARGIE: (Inaudible) because we don't
19 (inaudible) but I can see if I can get that --

20 CHAIRMAN JACZKO: Okay. So let's do
21 everything we can to get somebody on that plane.

22 MALE PARTICIPANT: Certainly, if it's
23 somebody in the NRC, it would be Northern Virginia.

24 CHAIRMAN JACZKO: Okay. Keep, keep
25 working on it and let me know what we've got.

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1 MARGIE: Can you check -- we need
2 dosimetry and Ki.

3 MALE PARTICIPANT: Dosimetry and --

4 MARGIE: We thought we had a CT scan.

5 MALE PARTICIPANT: Yeah, we --

6 SCOTT MORRIS:

7 MALE PARTICIPANT: We did, and the
8 dosimetry is out of date and (inaudible).

9 SCOTT MORRIS: Ki?

10 MARGIE: We have Ki. I think (inaudible)

11 --

12 SCOTT MORRIS: Okay, great. And the
13 status report is (inaudible) he lives 15 minutes away.
14 He's going toward Dulles.

15 CHAIRMAN JACZKO: Okay. Let's do
16 everything we can to --

17 MALE PARTICIPANT: But he would have to
18 get on the plane --

19 MARGIE: Well, they're holding it for 15
20 minutes, 20 minutes, I think. I mean, we can see if
21 they --

22 CHAIRMAN JACZKO: Okay, let's, let's do
23 what we need to do to notify people that we're working
24 to get somebody on the plane and see what we can do.

25 MALE PARTICIPANT: Okay. Sure.

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1 MARGIE: Can I just confirm?

2 CHAIRMAN JACZKO: Sure.

3 MARGIE: I'm going to put together a
4 message.

5 CHAIRMAN JACZKO: Okay.

6 MARGIE: And put together message and see,
7 to give a contact if we need to get that through
8 (inaudible). We get somebody else on --

9 MALE PARTICIPANT: That's the guy to --

10 MARGIE: Okay, we're going to get, we're
11 going to get him on this flight, and we'll try to get
12 them all the information that we just got from --

13 MALE PARTICIPANT: We're going to try to
14 get him on on this flight.

15 MARGIE: I, I, I understand, and I'll do
16 all I need to do.



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But again, it's not our event. We're not interfering with the regulators.

CHAIRMAN JACZKO: Yeah, okay.

MALE PARTICIPANT: What I don't have knowledge of -- Margie walked out -- is what, you know, what access have we had? Are we getting a frequent update from our NISA counterpart in --

MALE PARTICIPANT: I think what she said was, no, we're not getting any.

MALE PARTICIPANT: Yeah.

CHAIRMAN JACZKO: What about IAEA? Are we getting anything more from IAEA?

MALE PARTICIPANT: We've got one --

SCOTT MORRIS: One more press release just in the book.

CHAIRMAN JACZKO: Do we have a contact directly with their ops center?

SCOTT MORRIS: Yes.

MALE PARTICIPANT: Yes.

SCOTT MORRIS: And we have been going back to them on a periodic basis, you know, but again, all they're --

MALE PARTICIPANT: All they're getting, like GE and everybody else, we're getting --

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FJ 2616 of 2725

(Audio interference.)

MALE PARTICIPANT: Are you ready to leave?

MALE PARTICIPANT: I'm ready to go whenever you are, to go to the airport, yes.

MALE PARTICIPANT: We'll get that process facilitated. We'll --

MALE PARTICIPANT: You want me to get my passport? I don't keep my personal --

(Simultaneous conversation.)

MALE PARTICIPANT: Personal.

MALE PARTICIPANT: (Inaudible).

MALE PARTICIPANT: Perfect. Follow me.

MALE PARTICIPANT: Okay.

MALE PARTICIPANT: Thanks.

CHAIRMAN JACZKO: Thanks, guys.

MALE PARTICIPANT: And as a backup group, let's keep the second person ready to go.

MALE PARTICIPANT: Okay.

CHAIRMAN JACZKO: Okay, so let's go back then. So, diplomatic channels, that'll get better access to information (audio interference) would be worthwhile.

MALE PARTICIPANT: I agree.

MALE PARTICIPANT: You don't happen to have your passport on you, do you?

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FJ 2617 of 2725

1 MALE PARTICIPANT: We're hamstrung in our
2 ability to provide anything meaningful in terms of
3 (inaudible).

4 CHAIRMAN JACZKO: Have we done, have we
5 put together an update, the kind of update sheet we
6 had before with the latest information?

7 MALE PARTICIPANT: That's right. Bill was
8 going to go up then do --

9 (Simultaneous conversation.)

10 MALE PARTICIPANT: I was looking for it.
11 I couldn't find it.

12 SCOTT MORRIS: But what we did on the SET
13 report is that we placed priority on the Qs & As --

14 SCOTT MORRIS: Okay.

15 SCOTT MORRIS: -- to get those ready
16 because we really didn't have any substantive updates
17 based on new information.

18 CHAIRMAN JACZKO: Okay. Fine.

19 SCOTT MORRIS: We can update them, but
20 it's a little bit of a longer time cycle than getting
21 the Qs & As in place.

22 CHAIRMAN JACZKO: I think what Bill just
23 told me, I think is information that we probably
24 should share --

25 MALE PARTICIPANT: Okay.

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1 CHAIRMAN JACZKO: -- at an OOU, whatever
2 sensitivity level we need to share it.

3 SCOTT MORRIS: Okay.

4 CHAIRMAN JACZKO: I'm going to forward you
5 an email from an individual at the White House and
6 make sure, if you could, make sure to add them to one
7 of the distributions.

8 MALE PARTICIPANT: Okay.

9 CHAIRMAN JACZKO: I'll go do that right
10 now, and I'll call him back.

11 (Audio interference.)

12 MALE PARTICIPANT: While you're looking at
13 that, that PMT is working on scenarios with NOAA and
14 with NNSA.

15 CHAIRMAN JACZKO: Okay.

16 SCOTT MORRIS: We talked about three
17 scenarios. We encouraged them to do a fourth
18 scenario.

19 The scenarios are the Unit 1 source term
20 with a vented containment, like currently is going on.

21 CHAIRMAN JACZKO: Okay.

22 SCOTT MORRIS: Another one would be a 10-
23 percent tap release, filtered.

24 CHAIRMAN JACZKO: Okay.

25 SCOTT MORRIS: And then another one would

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1 be a 10-percent gap unfiltered release.

2 CHAIRMAN JACZKO: Okay.

3 SCOTT MORRIS: And a fourth one we pushed
4 for was a core melt scenario, where we it goes through
5 the base mat and you have a ground release.

6 CHAIRMAN JACZKO: And that would be in
7 order of a larger scenario.

8 MALE PARTICIPANT: Right.

9 CHAIRMAN JACZKO: And so, but the fourth
10 one, they were reluctant to do, or?

11 SCOTT MORRIS: They weren't reluctant to
12 do it. They just weren't working on it yet. It
13 sounded like they were near to having the first three
14 more or less done.

15 CHAIRMAN JACZKO: Okay.

16 MALE PARTICIPANT: So they're really doing
17 the other one. The other thing we talked about with
18 respect to the scenarios is whether we should be doing
19 a scenario for Unit 1 or for Unit 2?

20 CHAIRMAN JACZKO: Um-hmm.

21 MALE PARTICIPANT: They were using Unit 1
22 because (inaudible). Unit 1's a smaller unit. Unit 2
23 seemed to be the one more in trouble.

24 CHAIRMAN JACZKO: Yeah. So they're going
25 to go back and look at that, and what would the

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1 difference be in terms of the (inaudible).

2 MALE PARTICIPANT: There has been press
3 reporting about the Daiini facility.

4 SCOTT MORRIS: Right. We talked about
5 that before when Bill was in here, but we still don't
6 have knowledge about what is their condition.

7 CHAIRMAN JACZKO: Okay.

8 SCOTT MORRIS: So I think that's the
9 substantive update.

10 MALE PARTICIPANT: The Qs and As?

11 MALE PARTICIPANT: No.

12 SCOTT MORRIS: Now these are, these are
13 drafts. We realize these will continue to evolve.

14 MALE PARTICIPANT: We can share them when

15 --

16 SCOTT MORRIS: Folks on the phone don't
17 have them.

18 MARGIE: I'll get these out of here.

19 SCOTT MORRIS: Okay.

20 BILL RULAND: Do you have them?

21 Been Speaker.

22 FEMALE SPEAKER: I don't have them.

23 BILL RULAND: For those on the phone,
24 we've put together 10 or 11 Qs and As. We can share
25 those with you.

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1 MALE PARTICIPANT: That would be great.

2 SCOTT MORRIS: If you want to take those
3 with you.

4 MALE PARTICIPANT: Yeah.

5 SCOTT MORRIS: We'll continue to work
6 these overnight.

7 CHAIRMAN JACZKO: Okay, good.

8 SCOTT MORRIS: And by tomorrow morning, we
9 should be better on the answers.

10 CHAIRMAN JACZKO: Okay

11 SCOTT MORRIS: And I think one thing
12 we can do is continue to watch news coverage and just
13 anticipate questions that may continue to evolve
14 overnight and be ready to respond.

15 CHAIRMAN JACZKO: Yeah.

16 SCOTT MORRIS: At some point, the question
17 will be, do you want to share these with the other
18 federal partners? And --

19 CHAIRMAN JACZKO: Probably not until we
20 feel like there's less draft.

21 MALE PARTICIPANT: Correct.

22 CHAIRMAN JACZKO: Understand that I could
23 use these at any moment, so if there's anything in
24 here that is not accurate, let's not put it in. But -

25 -

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1 MALE PARTICIPANT: I'd say it's all
2 accurate.

3 SCOTT MORRIS: Yes, sir.

4 MALE PARTICIPANT: It may not be --
5 (inaudible).

6 (Laughter.)

7 CHAIRMAN JACZKO: Okay, thank you. And
8 we've reached out to people so they know who's coming?
9 Okay, thank you. I appreciate it.

10 Okay. What else?

11 SCOTT MORRIS: I think that's all.

12 BILL RULAND: We're, we're going to do a
13 turnover and we're going to do a specific brief at
14 11:15.

15 CHAIRMAN JACZKO: And let's do it, keep
16 that short and to the facts.

17 SCOTT MORRIS: Right.

18 CHAIRMAN JACZKO: I think they'll want
19 that to become a what-if scenario.

20 SCOTT MORRIS: Right.

21 CHAIRMAN JACZKO: So it's very important.
22 Josh will be on the line. If it gets that way, he'll
23 take the heat for cutting it off at the pass. Good
24 luck.

25

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1 [REDACTED]
2 [REDACTED]
3 [REDACTED]
4 [REDACTED]
5 At this point, would you say that there's
6 anything that I should respond to with that?

7 SCOTT MORRIS: I think it's --

8 MALE PARTICIPANT: Our, our simulation,
9 based on what we know, seems to have this thing
10 turning in the wrong direction.

11 SCOTT MORRIS: So, but that's not a
12 significant update --

13 MALE PARTICIPANT: It's not a significant
14 update. Since your last conference call, we haven't
15 had anything to suggest to us that it's, it's breaking
16 and things are getting better or worse.

17 MALE PARTICIPANT: (Inaudible).

18 CHAIRMAN JACZKO: Okay. I tell you, if I
19 respond and say that, that is -- from what can gather,
20 it's continuing --

21 MALE PARTICIPANT: If nothing else
22 changes, then it's going to continue to get worse.

23 CHAIRMAN JACZKO: Okay.

24 SCOTT MORRIS: And we're challenged by not
25 having plant status?

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1 MALE PARTICIPANT: No good news is bad
2 news. Very bad news.

3 CHAIRMAN JACZKO: Okay, well, that's
4 probably, if we can get Bill if he gets back, a kind
5 of sense --

6 SCOTT MORRIS: In his --

7 CHAIRMAN JACZKO: -- in the update of his
8 and get that around to the federal family as soon as
9 possible in an email, that would be --

10 SCOTT MORRIS: Okay.

11 CHAIRMAN JACZKO: -- that's important.

12 SCOTT MORRIS: All right.

13 CHAIRMAN JACZKO: It's not significantly
14 new information, but it is information, though
15 slightly differently characterizing it.

16 CHAIRMAN JACZKO: The last update really
17 was the IAEA summary of the status of the three units.

18 MALE PARTICIPANT: Yeah, which was not
19 very positive.

20 CHAIRMAN JACZKO: Yeah, right. But I
21 think putting in writing what generally you just told
22 me, again, would be appropriate in sourcing and put it
23 out to people. So we should have that by 11:30.

24 MALE PARTICIPANT: They have all the
25 facts. They have all facts.

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FJ 2625 of 2725

1 MALE PARTICIPANT: Yeah, we'll get it
2 reviewed during turnover.

3 CHAIRMAN JACZKO: Okay, so --

4 SCOTT MORRIS: Let's get them on.

5 CHAIRMAN JACZKO: -- follow me closely.
6 I'll do my best. And if we need to postpone anything
7 to get that together -- you know, again, as I think
8 about this, this is fundamentally a communication
9 event for us, so the priority is on getting access to
10 information and getting it distributed because nobody
11 else in the federal government has as much information
12 as we do, nor does anyone else in the federal
13 government have the expertise that we have. We want
14 to continue to give them our expert judgment because,
15 otherwise, they'll be filling in the dimensions.

16 MALE PARTICIPANT: We can interpret this -

17 -

18 CHAIRMAN JACZKO: Exactly.

19 SCOTT MORRIS: Okay. Great.

20 CHAIRMAN JACZKO: Thanks, everybody.

21 SCOTT MORRIS: Thank you.

22 CHAIRMAN JACZKO: And if things changed,
23 call me any hour. If you want to give me a call a
24 couple hours just to give me an update, then fine.

25 MALE PARTICIPANT: There'll be a new, new

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1 crew in here starting about seven tomorrow morning.

2 CHAIRMAN JACZKO: And so, then, let's
3 plan, absent anything materializing overnight,
4 updating me at -- what would be a good time in the
5 morning?

6 MALE PARTICIPANT: How about 6:30, 7:00?
7 The seven o'clock time?

8 CHAIRMAN JACZKO: Okay.

9 MALE PARTICIPANT: We'll probably come in
10 at 630-ish.

11 MALE PARTICIPANT: Chairman, before you --
12 (Audio interference.)

13 CHAIRMAN JACZKO: Okay, I'll try to call
14 in at seven. And thanks everybody.

15 MARCE: Scott will be here overnight
16 (inaudible)

17 CHAIRMAN JACZKO: And again, although the
18 threshold, if something happened, if misinformation
19 starts propagating, do what we need to do. I think
20 the federal family is engaged as they can. The White
21 House is engaged as much as it can. But if there's
22 inaccurate information, then we need to correct, let's
23 get out there and correct it.

24 MALE PARTICIPANT: Excuse me, Mr.
25 Chairman.

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1 CHAIRMAN JACZKO: Yes?

2 MALE PARTICIPANT: Are you waiting for
3 that briefing sheet before you leave? (Inaudible)
4 wanted to know how much time he had.

5 SCOTT MORRIS: It'll be thirty minutes.
6 Close. If you've got it, I'd love to see it before it
7 goes out, but --

8 MALE PARTICIPANT: It's going to come here
9 first, I'm sure.

10 CHAIRMAN JACZKO: Okay good.

11 MALE PARTICIPANT: How do we spell Tony's
12 last name?

13 MALE PARTICIPANT: We need that for
14 clearance and all that stuff.

15 MALE PARTICIPANT: Ulises is U-L-S-E-S.

16 MALE PARTICIPANT: U-L-S-E-S, thank you.

17 MALE PARTICIPANT: there's a commercial
18 charter flight that's leaving, a non-military flight,
19 and it's --

20 MALE PARTICIPANT: Anthony --

21 (Simultaneous conversation.)

22 MALE PARTICIPANT: Middle name, anybody?
23 Does anybody have it?

24 MALE PARTICIPANT: I should be in the NRC
25 director.

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FJ 2628 of 2725

1 SCOTT MORRIS: Just look in the NRC
2 directory. It should be in the NRC directory.

3 MALE PARTICIPANT: So, Dan, your tech tag
4 number?

5 CHAIRMAN JACZKO: I'm going to put you on
6 an email that (audio interference) head back to the
7 White House. Are you or Dan --

8 MALE PARTICIPANT: Dan's not going
9 (Audio interference).

10 SCOTT MORRIS: Anything for the folks on
11 the phone?

12 ELLIOTT: Yeah, this is Elliott. I did
13 not hear what our start time in the morning was.

14 SCOTT MORRIS: The call with the Chairman
15 will be at seven o'clock.

16 ELLIOTT: Okay.

17 JOSH BASKIN: None from Josh. Thank you.

18 SCOTT MORRIS: Okay.

19 Becky, anything from you?

20 BECKY: No. I'll be there at seven in the
21 morning. I switch over with Jean.

22 SCOTT MORRIS: Okay, very good.

23 (Whereupon, there was a long pause on the
24 record.)

25 MALE PARTICIPANT: So who do we want share

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1 that with?

2 SCOTT MORRIS: The people we've been
3 pumping information out to in terms of our situation
4 report, including the additional name that the
5 Chairman (audio interference) said.

6 MALE PARTICIPANT: I just want to be clear
7 who we let out to.

8 SCOTT MORRIS: We need to mark it
9 appropriately.

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1 (CONFERENCE CALL INITIATED.)

2 MALE PARTICIPANT: I don't know whether
3 it's reliable information. We have it secondhand.

4 SCOTT MORRIS: They said that there was a
5 total blackout of --

6 MALE PARTICIPANT: On the island.

7 SCOTT MORRIS: -- on the island.

8 MALE PARTICIPANT: And that's not what
9 we're hearing.

10 SCOTT MORRIS: Yeah, definitely not.

11 MALE PARTICIPANT: That's (inaudible)
12 correct because we're talking, or have talked to
13 someone on one of the islands that island that had
14 wattage. The Navy base had a loss of power. So the
15 island itself --

16 SCOTT MORRIS: Yeah.

17 MALE PARTICIPANT: -- is not a total
18 blackout. I, I heard it in here, and I just want to
19 make sure that we don't --

20 SCOTT MORRIS: That's why we said, well --

21 MALE PARTICIPANT: Yeah, and we never saw
22 the outline press release.

23 (Simultaneous conversation.)

24 MALE PARTICIPANT: Yeah, but they may -- I
25 don't think they left all the power.

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FJ 2631 of 2725

1 MALE PARTICIPANT: There are two federal
2 liaisons team members. They're both ex-Navy or
3 current Navy, and both are in Japan, so they're
4 reaching out to their friends and (inaudible) piece,
5 and I think if they can establish any links and get us
6 a TBD, it would be whatever we can find for
7 information in order to preclude those (inaudible).

8 MALE PARTICIPANT: Okay. Thank you.

9 MALE PARTICIPANT: I'm going to leave
10 after I turn it over to Sam.

11 MALE PARTICIPANT: Thank you. I
12 appreciate it.

13 MALE PARTICIPANT: There's a nuclear plant
14 worker on the phone?

15 SCOTT MORRIS: No. She's on the phone off
16 and just --

17 MALE PARTICIPANT: All right, for those of
18 you on the phone, we're going to go on mute.
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1 (CONFERENCE CALL INITIATED.)

2 (Roster playback.)

3 SCOTT MORRIS: Is this a Scott Morris in
4 the Headquarters Operations Center. As you probably
5 know, the NRC is in a monitoring mode right now,
6 monitoring the after-effects of the earthquake and
7 tsunami in Japan, which has affected the two, two
8 units in particular that I'm going to discuss tonight,
9 the Daiichi Unit 1 and 2, both boiling water reactor
10 facilities, Unit 1 being an older, vintage boiling
11 water reactor similar to Oyster Creek or Dresden, Unit
12 2 being slightly more modern but still an, an older
13 Mark 1 containment design.

14 Before I say much about the technical
15 aspects of what's happening at those facilities, I
16 just wanted to just point out that most of what we're
17 getting is from press releases from the company TEPCO,
18 some information from the Japanese regulatory agency,
19 and essentially media reporting that we're getting on
20 the newswires and on the cable news networks.

21 So I will say that it's, the, the, the
22 level of, or, the quantity and quality of information
23 that we're getting is, is less than what we would,
24 that we're normally accustomed to, and it's been
25 rather frustrating.

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1 But aside from that, what we do know is
2 that the units are shut down. They have in fact lost
3 off-site power. The diesel generators apparently did
4 start and run for a period of time, but a 35-, what's
5 been reported as a 35-foot wave hit the site, and what
6 we've learned is that most of the infrastructure
7 supporting the facility is above ground, including the
8 diesel fuel oil storage tank, which apparently was
9 swept off its stanchions, and that's essentially the
10 reason why the diesel ultimately stopped operating and
11 the plants were eventually in station blackout
12 scenario, with only their battery power and steam-
13 driven pumps available.

14 Unit 1 is an iso-, isolation condenser
15 plant, so it's a passive design for, you know, core
16 isolation cooling. But Unit 2 has a reactor core
17 isolation cooling system, what's basically a small
18 steam turbine that can provide makeup. And at least
19 until such time as, or, while makeup water is
20 available. It's not clear at this point whether even
21 those are operating.

22 The, so, essentially, we're in a, what we
23 believe is a, a station blackout scenario, that it's
24 been that way for several, upwards of 12, 14 hours
25 now. What we also know from reporting is that

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1 containment pressure has, has risen substantially.
2 We've heard reports of upwards of 80 pounds, 80 PSIG,
3 in the containment building. That is in excess of the
4 design, design of those containment structures,
5 assuming, of course, that they're built to the same
6 specs that a similar design in the United States is
7 built.

8 We heard that, we also heard reporting
9 that the operators were attempting to vent that
10 containment, to, you know, to relieve some of that
11 pressure, obviously in an effort to ensure that there
12 isn't some catastrophic failure of that containment
13 structure. It's not clear whether that's been
14 successful. We've heard conflicting reports in the
15 media about steam releases, radioactive steam
16 releases, from the facility. None of that's been
17 confirmed.

18 Our reactor safety team here has spoken
19 with General Electric's support facility. They've
20 spoken with Exelon Corporate, who was contacted by GE
21 asking Exelon to run some simulator scenarios on their
22 Quad, Quad Cities simulator as well as their Dresden
23 simulators to run through a few different scenarios to
24 try to get a handle on the type of, you know, timing
25 of what they might expect certain things to happen in

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FJ 2635 of 2725

1 the facility.

2 Our own, the reactor safety team here --
3 again, given the sketchy information that we have and
4 using the knowledge and skills that our team has --
5 basically have determined that, you know, if this
6 continues, if this station blackout situation
7 continues unabated, then there will likely be some
8 kind of core damage, and if containment pressure gets
9 worse, they're going to have to, they're going to have
10 to somehow find a way to relieve that, which obviously
11 would, is not a good thing, but it's better than a
12 catastrophic failure.

13 They've looked at how this would rate on
14 the INES scale, International Nuclear Event Scale, and
15 apparently it was rated the Level III at least.

16 The United States federal family -- there
17 have been a number of meetings convened at the White
18 House level and we've had a number of interactions
19 with our partners, both domestic partners and
20 international partners, and we are prepared to, or we
21 are attempting to -- let me back up.

22 The USAID, which is part of the State
23 Department, is putting together a team of technical
24 assistants from the federal family, including the NRC,
25 to, to get on a military flight this evening to travel

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1 to Tokyo -- I'm sorry, to travel to Japan; I'm not
2 exactly sure where they'll land -- but, in order to
3 provide technical assistance.

4 It's not clear whether our, the NRC
5 technical person will be able to make that military
6 flight tonight. We're hoping to get him on it. It
7 was supposed to leave at 11:30. If not, there's a
8 commercial flight. We're looking at tomorrow morning.

9 But the point I'm trying to make is that we are
10 trying to provide some kind of support to them.

11 We've heard that the, the Japanese
12 government is interested in, in getting engineering
13 assistance from us. We do know that, we have heard
14 through certain channels that they're not looking for
15 the sort of aerial monitoring from the United States
16 but rather just engineering assistance.

17 Let's see. We've put together a series of
18 questions and answers. We're continuing to refine
19 them. We have shared those with the Chairman. And
20 again, we'll, as we learn more, we'll continue to
21 refine those.

22 The staff is working shift work. We're in
23 the middle or just completed a turnover at 11 o'clock,
24 and we'll do another turnover tomorrow morning at, at
25 7:00 a.m. So we're looking at rosters and how to

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1 provide continuing support and follow-up to this event
2 going forward.

3 Subject to your questions, that's all I
4 have.

5 MALE PARTICIPANT: Scott, do you want to
6 talk a little bit about the (inaudible) ET?

7 SCOTT MORRIS: Yes.

8 I, I, I take it from the silence there
9 aren't any questions.

10 Dan Dorman will be leading the executive
11 team through the evening, as well as myself, will be
12 here. We've also got a full complement of our liaison
13 team. We've also got reactor safety team personnel,
14 as well as protective measures personnel and a variety
15 of support staff.

16 MALE PARTICIPANT: But not full teams?

17 SCOTT MORRIS: But not full teams,
18 correct.

19 JOSH BASKIN: Scott, this is Josh Baskin.
20 I just wanted to confirm, is there someone from
21 Commissioner Apostolakis's office on the phone? I
22 heard the other three, but not that one.

23 MALE PARTICIPANT: This is the
24 headquarters operations officer. I placed a lot of
25 people on mute because of the feedback. If you need

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1 to speak, hit star-6 again.

2 MALE PARTICIPANT: Okay, well, I'll stay
3 here until, for another minute or so.

4 MALE PARTICIPANT: Josh, we did not also
5 hear Commissioner Apostolakis's office come on.

6 JOSH BASKIN: Okay. (Inaudible.)

7 MALE PARTICIPANT: Okay.

8 SCOTT MORRIS: There hasn't been -- I'll
9 just add, there hasn't been a lot of, there's
10 obviously been a lot of media interest in what's
11 happening in Japan, but, but we're not, we at the NRC
12 have not received a lot of inquiries, at least not
13 yet. That doesn't mean we're not preparing for that,
14 and that's the basis for us putting together --

15 HOLLY: Au contraire.

16 SCOTT MORRIS: Oh, well, Holly's here to
17 tell me differently. She's just been putting them
18 off, I guess.

19 HOLLY: We have been responding as
20 appropriate to media inquiries, but we've not been
21 anybody out in front of the camera.

22 SCOTT MORRIS: Well, that's fair.

23 HOLLY: That's our strategy for now. That
24 is likely to change over the weekend as, as
25 circumstances change.

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1 There are two press releases out, by the
2 way, and two blog posts.

3 SCOTT MORRIS: Okay. Good.

4 HOLLY: And by the way, we got 200
5 visitors to the blog today -- I'm sorry -- 2,000
6 visitors.

7 SCOTT MORRIS: Two thousand visitors to
8 the blog today.

9 MALE PARTICIPANT: (Inaudible)?

10 HOLLY: There were a few that had to do
11 with speculating what was happening in Japan, and
12 those weren't posted. And we addressed those in the
13 second post that we weren't posting comments based on
14 speculation.

15 SCOTT MORRIS: Okay.

16 Scott.

17 MALE PARTICIPANT: Scott is doing OPA
18 overnight?

19 HOLLY: Scott will be in here all night,
20 and Elliott will be in in the morning.

21 MALE PARTICIPANT: There have been a
22 variety of "technical experts" being interviewed by
23 various media outlets, including, including Ed Lyman
24 and a professor from MIT and a professor from the
25 University of Georgia.

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1 Are there any questions?

2 MIKE FRANOVICH: Scott, this is Mike
3 Franovich. I have just a quick question. I just want
4 to make sure, do we have any information on Daiini? I
5 thought the TEPCO site had indicated that the four
6 units there were now being directed to do containment
7 venting.

8 SCOTT MORRIS: I don't know -- I have not
9 heard that. What we have heard about Daiini he is
10 that -- and for those on the phone who don't know,
11 it's fairly, there's four units at Daiini that are in
12 relative close proximity to the Daiichi facility.
13 What we've heard is that well, we've heard mixed
14 reports, but we, we haven't heard anything that was as
15 dire as what we heard for the Daiichi units, so what
16 you're sharing with us now is new to me, new to us.

17 MIKE FRANOVICH: Yeah, I think it just
18 went, posted on the TEPCO site here just before the
19 phone call.

20 SCOTT MORRIS: Okay. Well, we'll
21 obviously look into that.

22 JENNIFER YULE (phon): Scott, this is
23 Jennifer Yule. What do they mean by "technical
24 assistance"? I mean, obviously, they're following the
25 EOPs, right, the plans for station blackouts?

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1 SCOTT MORRIS: Well, we can only assume
2 because we haven't been in direct contact with them.

3 The, the request that we got -- and by the
4 way, we do have a technical staff member down at USAID
5 who's been on their, participating in their
6 discussions down there. I've not spoken with him
7 directly in the last two hours, but the engineering
8 assistance is all we've heard.

9 MALE PARTICIPANT: Yeah, until that
10 request comes in, Jennifer, we won't know, so -- they
11 don't have, by the way, symptom-based EOPs.

12 JENNIFER YULE: Well, it's pretty clear
13 what's happening with the station blackout, I would
14 think.

15 MALE PARTICIPANT: Oh, yeah.

16 SCOTT MORRIS: Any other questions?

17 JENNIFER YULE: Just to point out, our
18 SORCA analysis for Peach Bottom Unit 1 -- it's a Mark
19 1 design, and this a long-term station blackout. It's
20 something that we've analyzed, and so we've got a
21 pretty detailed time line if you want to look at that,
22 including what the consequences would most likely be
23 from whatever release may happen.

24 SCOTT MORRIS: All right. We, we actually
25 have the chart from that SORCA analysis sitting right

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1 here in front of us.

2 JENNIFER YULE: All right, good.

3 SCOTT MORRIS: Any other questions?

4 (No response.)

5 SCOTT MORRIS: All right, thank you.

6 JOSH BASKIN: Thank you guys very much.

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1 (CONFERENCE CALL INITIATED.)

2 DAN DORMAN: Go ahead, Chairman.

3 CHAIRMAN JACZKO: Hi, Dan. How are you?

4 DAN DORMAN: Hi, chairman.

5 CHAIRMAN JACZKO: Are you getting email?

6 DAN DORMAN: Yes.

7 CHAIRMAN JACZKO: Did you get the email
8 that I just forwarded you?

9 DAN DORMAN: Hang on. I'll check. Yes, I
10 did.

11 CHAIRMAN JACZKO: Can you get me back, in
12 10 minutes, just a high-level analysis of what that
13 means?

14 DAN DORMAN: Yes, sir.

15 CHAIRMAN JACZKO: Ten minutes -- I need it
16 right away.

17 DAN DORMAN: Okay.

18 CHAIRMAN JACZKO: Just in an email --
19 again, just high-level assessment of what we think
20 that means.

21 DAN DORMAN: Yes, sir. Will do.

22 CHAIRMAN JACZKO: Okay. Thank you.

23 DAN DORMAN: Okay.

24 Hey, Bill?

25 BILL RULAND: I don't know what it is.

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1 (CONFERENCE CALL INITIATED.)

2 CHAIRMAN JACZKO: Hey, Dan.

3 MALE PARTICIPANT: Dan is not here right
4 now, sir.

5 CHAIRMAN JACZKO: Okay. Is he working to
6 get me an answer back on the information I gave him?

7 MALE PARTICIPANT: Yes.

8 CHAIRMAN JACZKO: Okay, Good. I need it
9 as soon as possible.

10 MALE PARTICIPANT: They're --

11 MALE PARTICIPANT: Hey, Dan?

12 MALE PARTICIPANT: -- they're hovering in
13 the other room right now. Mike went to go tap their
14 shoulders.

15 CHAIRMAN JACZKO: Okay. Thanks. Just if
16 you can get back to me in, as soon as possible.

17 MALE PARTICIPANT: Absolutely. Yes, sir.

18 CHAIRMAN JACZKO: Thank you.

19 MALE PARTICIPANT: Bye-bye.

20 CHAIRMAN JACZKO: Yes, sir.

21 (END OF SERIES.)
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23
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UNITED STATES NUCLEAR REGULATORY COMMISSION



BRIEFING ON STATUS OF EVENTS IN JAPAN AND U.S. FLEET STATUS ON STATION BLACKOUT

APRIL 28, 2011

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Protecting People and the Environment

Station Blackout and Advanced Accident Mitigation (B.5.b) Overview

Pat Hiland, Director

Division of Engineering

Office of Nuclear Reactor Regulation

April 28, 2011

Station Blackout Background

- **WASH-1400, "Reactor Safety Study," issued 1975, indicated that station blackout (SBO) could be an important contributor to the total risk from nuclear power plant accidents**
- **In 1980, the Commission designated the issue of station SBO as Unresolved Safety Issue (USI) A-44, "Station Blackout"**
- **NRC issued the final SBO Rule (10 CFR 50.63) on June 21, 1988**
- **SBO Rule requires each plant to be able to cope and recover from an SBO event**

Station Blackout Staff Evaluations

- **NRC issued Regulatory Guide (RG) 1.155, "Station Blackout," on August 1988 and endorsed NUMARC 87-00 industry guidance to implement the SBO Rule**
- **All 104 plants met the SBO rule requirements at the time of the staff's review**
 - **Safety Evaluations**
 - **Pilot Inspections**
- **License Renewal Application reviews - Staff verifies the scoping and aging management of systems, structures, and components required for SBO in accordance with 10 CFR 54.4(a)(3) and 10 CFR 54.21**

Station Blackout - New Reactors

- **All new standard reactor designs must include an alternate ac (AAC) power source with diverse design to cope with an SBO for 8-hours**
- **New reactors with passive designs cope with an SBO with battery power for 72-hours**

B.5.b Requirements

NRC Imposed Requirements after the events of September 11, 2001

- **Interim Compensatory Measures Order EA-02-026**
- **License Condition**
- **10 CFR 50.54(hh)(2)**

10 CFR 50.54(hh)(2)

“Each licensee shall develop and implement guidance and strategies intended to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities under the circumstances associated with loss of large areas of the plant due to explosions or fire”



U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Station Blackout Preparedness and Coping

George Wilson

**Branch Chief, Division of Engineering
Office of Nuclear Reactor Regulation**

April 28, 2011

SBO Rule

- **Rule in Federal Register 10CFR50.63**
“Loss of all alternating current power”
- **SBO Rule requires each plant to be able to cope and recover from an SBO event of specified duration**
- **NRC issued Regulatory Guide (RG) 1.155, “Station Blackout,” on August 1988 and endorsed NUMARC 87-00 industry guidance to implement the SBO Rule**

SBO Coping

- **Rule provided guidance on how to calculate the plant specific SBO duration.**
- **The coping duration based on following factors:**
 - **The redundancy of the onsite emergency ac power sources**
 - **The reliability of the onsite emergency ac power sources**
 - **The expected frequency of loss of offsite power**
 - **The probable time needed to restore offsite power**
- **SBO event ends when either offsite or onsite power is restored**

Coping Methods

- **AC independent**
 - 44 plants rely on batteries only
 - Maximum duration 4 hours
- **Alternate AC**
 - 60 plants in this category
 - Emergency Diesel Generators from adjacent unit with excess capacity
 - Gas turbine generators, diesel generators and hydro units
 - Appendix R Diesel generators

Staff Review of SBO Rule Implementation

- **NRC staff reviewed and approved by safety evaluations all 104 plants SBO submittals.**
- **NRC staff conducted pilot inspections at 8 sites (2 per region) using NRC Temporary Instruction 2515/120**
- **Inspection results revealed that the licensees were implementing the SBO Rule consistent with NRC requirements and staff's safety evaluations**

Design Overview

- **Battery coping plants - maximum coping duration is 4 hours**
- **Battery life may be extended to required duration by load shedding**
- **Effects of loss of ventilation.**
- **Condensate, compressed air and RCS inventories verified for adequacy**
- **Procedures developed for SBO**
- **Operator training**

SBO Procedures

- 1. Specific actions for restoration of AC power**
- 2. Ensure support equipment functional without AC**
- 3. High priority on steam driven pumps**
- 4. Identify RCS leakage paths**

Grid Interface

- **Grid Interface Enhancements**

- **Grid operator evaluates network on daily basis**
- **Plant procedures for degraded grid conditions**
- **Plant controlled work in switchyard**
- **High priority for TSO to restore power**
- **New guidelines from NERC**

Summary

- **Only one U.S plant has had an SBO, it was in 1990 (App. 1 hour)**
- **SBO compliance evaluated for**
 - **License renewal**
 - **Power uprates**
 - **License amendment requests**
 - **New Reactors**
- **Staff interfacing with FERC to maintain reliability with future changes in generation mix and transmission system upgrades.**



U.S. NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Extensive Damage Mitigating Guidelines (B.5.b)

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Office of Nuclear Reactor Regulation

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B.5.b Strategies

- **Details Designated Official Use Only - Security Related Information**
- **Flexible, Deployable Strategies Providing Alternate Means to Accomplish Key Safety Functions**

Phased Approach

- **Phase 1 – Readily Available Materials and Personnel**
- **Phase 2 – Spent Fuel Pools**
- **Phase 3 – Core Cooling and Containment**

Phase 1 – Readily Available

- **Existing Programs & Equipment**
- **Best Practices from Initial Response**
- **Lessons Learned from Analyses**

Phase 1 Strategies

- **Memoranda of Understanding**
- **Fire Fighting Enhancements**
- **Passive Measures**

Phase 2 - Spent Fuel Pool Cooling

- **Make-up Water**
- **Cooling Spray**
- **Power Independence**

Phase 3 - Core Cooling and Containment

- **Key Safety Functions Based on Plant Specifics**

Boundary Conditions:

- **Loss of All Internal Power Distribution**
- **Minimum Staffing**

Utility of B.5.b Strategies in SBO

- **Entry Conditions More Conservative than SBO**
- **Use of Strategies Has Potential to Extend Duration for Supplying Key Safety Functions**

Acronyms

- **B.5.b – Mitigating Strategies Requirements from Order EA-02-026, Section B.5.b, the Subsequent License Conditions, and 10 CFR 50.54(hh)(2)**
- **SBO – Station Blackout**

TABLE OF CONTENTS

	TAB No
The Station Blackout Rule 10CFR50.63	1
Statement of Considerations Federal Register	2
Regulatory Guide 1.155 Station Blackout	3
New Reactors SECY-90-016 Station Blackout Requirements	4
New Reactors Staff Requirements Memoranda	5
SBO Rule Office Of General Counsel Memo April 2008	6
SBO Rule Office Of General Counsel Memo License Renewal	7
NUREG -1776 Regulatory Effectiveness of the Station Blackout Rule	8
NUREG/CR-6891 Analysis of Loss of Offsite Power events: 1986-2004	9
Update to NUREG/CR-6891 LOOP events up to 2009	10
Summary of Coping Methods (US Plants)	11
Summary of Recent Inspection Findings	12
Station Blackout Event at Vogtle Nuclear Plant	13
NERC Standard for Nuclear Plant and Grid Interface	14
TI 2515/120 Inspection of Implementation of Station Blackout Rule	15
TI 2546/183 Followup to Fukushima Daiichi Nuclear Station Event	16
IN 2011-05 Tohoku-Taiheiyou-Okai Earthquake Effects On Japanese Plants	17
Examples of EDG problems concurrent with LOOP events	18

Condition of licenses - 10 CFR 50.54	19
NRC ICM Order EA-02-026	20
Applicability of Mitigating System Strategies Requirements of Order EA-02-026	21
B.5.b Requirements: Strategies Beneficial to SBO	22
Summary Report B5.B	23
Updated Status – Baseline ROP	24
Temporary Instruction 2515/171	25
ISG-06 – Compliance with 10 CFR 50.54(hh)(2) and 10 CFR 52.80(d)	26

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[Page 783-784]

TITLE 10--ENERGY

CHAPTER I--NUCLEAR REGULATORY COMMISSION

PART 50--DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES-- Table of Contents

Sec. 50.63 Loss of all alternating current power.

(a) Requirements. (1) Each light-water-cooled nuclear power plant licensed to operate must be able to withstand for a specified duration and recover from a station blackout as defined in Sec. 50.2. The specified station blackout duration shall be based on the following factors:

- (i) The redundancy of the onsite emergency ac power sources;
- (ii) The reliability of the onsite emergency ac power sources;
- (iii) The expected frequency of loss of offsite power; and
- (iv) The probable time needed to restore offsite power.

(2) The reactor core and associated coolant, control, and protection systems, including station batteries and any other necessary support systems, must provide sufficient capacity and capability to ensure that the core is cooled and appropriate containment integrity is maintained in the event of a station blackout for the specified duration. The capability for coping with a station blackout of specified duration shall be determined by an appropriate coping analysis. Licensees are required to have the baseline assumptions, analyses, and related information used in their coping evaluations available for NRC review.

(b) Limitation of scope. Paragraph (c) of this section does not apply to those plants licensed to operate prior to July 21, 1988, if the capability to withstand station blackout was specifically addressed in the operating license proceeding and was explicitly approved by the NRC.

[[Page 784]]

(c) Implementation--(1) Information Submittal. For each light-water-cooled nuclear power plant licensed to operate on or before July 21, 1988, the licensee shall submit the information defined below to the Director of the Office of Nuclear Reactor Regulation by April 17, 1989. For each light-water-cooled nuclear power plant licensed to operate after the effective date of this amendment, the licensee shall submit the information defined below to the Director by 270 days after the date of license issuance.

(i) A proposed station blackout duration to be used in determining compliance with paragraph (a) of this section, including a justification for the selection based on the four factors identified in paragraph (a) of this section;

(ii) A description of the procedures that will be implemented for station blackout events for the duration determined in paragraph (c) (1) (i) of this section and for recovery therefrom; and

(iii) A list of modifications to equipment and associated procedures, if any, necessary to meet the requirements of paragraph (a) of this section, for the specified station blackout duration determined in paragraph (c) (1) (i) of this section, and a proposed schedule for implementing the stated modifications.

(2) Alternate ac source: The alternate ac power source(s), as defined in Sec. 50.2, will constitute acceptable capability to withstand station blackout provided an analysis is performed which demonstrates

that the plant has this capability from onset of the station blackout until the alternate ac source(s) and required shutdown equipment are started and lined up to operate. The time required for startup and alignment of the alternate ac power source(s) and this equipment shall be demonstrated by test. Alternate ac source(s) serving a multiple unit where onsite emergency ac sources are not shared between units must, as a minimum, the capacity and capability for coping with a station blackout in any of the units. At sites where onsite emergency ac sources are shared between units, the alternate ac source(s) must have the capacity and capability as required to ensure that all units can be brought to and maintained in safe shutdown (non-DBA) as defined in Sec. 50.2. If the alternate ac source(s) meets the above requirements and can be demonstrated by test to be available to power the shutdown buses within 10 minutes of the onset of station blackout, then no coping analysis is required.

(3) Regulatory Assessment: After consideration of the information submitted in accordance with paragraph (c)(1) of this section, the Director, Office of Nuclear Reactor Regulation, will notify the licensee of the Director's conclusions regarding the adequacy of the proposed specified station blackout duration, the proposed equipment modifications and procedures, and the proposed schedule for implementing the procedures and modifications for compliance with paragraph (a) of this section.

(4) Implementation Schedule: For each light-water-cooled nuclear power plant licensed to operate on or before June 21, 1988, the licensee shall, within 30 days of the notification provided in accordance with paragraph (c)(3) of this section, submit to the Director of the Office of Nuclear Reactor Regulation a schedule commitment for implementing any equipment and associated procedure modifications necessary to meet the requirements of paragraph (a) of this section. This submittal must include an explanation of the schedule and a justification if the schedule does not provide for completion of the modifications within two years of the notification provided in accordance with paragraph (c)(3) of this section. A final schedule for implementing modifications necessary to comply with the requirements of paragraph (a) of this section will be established by the NRC staff in consultation and coordination with the affected licensee.

[53 FR 23215, June 21, 1988, as amended at 63 FR 50480, Sept. 22, 1998]

Rules and Regulations

Federal Register

Vol. 53, No. 119

Tuesday, June 21, 1988

This section of the FEDERAL REGISTER contains regulatory documents having general applicability and legal effect, most of which are keyed to and codified in the Code of Federal Regulations, which is published under 50 titles pursuant to 44 U.S.C. 1510.

The Code of Federal Regulations is sold by the Superintendent of Documents. Prices of new books are listed in the first FEDERAL REGISTER issue of each week.

NUCLEAR REGULATORY COMMISSION

10 CFR Part 50

Station Blackout

AGENCY: Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The Nuclear Regulatory Commission is amending its regulations to require that light-water-cooled nuclear power plants be capable of withstanding a total loss of alternating current (ac) electric power (called "station blackout") for a specified duration and maintaining reactor core cooling during that period. This requirement is based on information developed under the Commission's study of Unresolved Safety Issue A-44, "Station Blackout." The amendment is intended to provide further assurance that a loss of both offsite power and onsite emergency ac power systems will not adversely affect the public health and safety.

EFFECTIVE DATE: July 21, 1988.

FOR FURTHER INFORMATION CONTACT: Aleck Serkiz, Division of Reactor and Plant Systems, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Telephone: (301) 492-3555.

SUPPLEMENTARY INFORMATION:

Background

The alternating current (ac) electric power for essential and nonessential service in a nuclear power plant is supplied primarily by offsite power. Redundant onsite emergency ac power systems are also provided in the event that all offsite power sources are lost. These systems provide power for various safety functions, including reactor core decay heat removal and containment heat removal, which are

essential for preserving the integrity of the reactor core and the containment building, respectively. The reactor core decay heat can also be removed for a limited time period by safety systems that are independent of ac power.

The term "station blackout" means the loss of offsite ac power to the essential and nonessential electrical buses concurrent with turbine trip and the unavailability of the redundant onsite emergency ac power systems (e.g., as a result of units out for service of maintenance or repair, failure to start on demand, or failure to continue to run after start). If a station blackout persists for a time beyond the capability of the ac-independent systems to remove decay heat, core melt and containment failure could result.

The Commission's existing regulations establish requirements for the design and testing of onsite and offsite electric power systems that are intended to reduce the probability of losing all ac power to an acceptable level. (See General Design Criteria 17 and 18, 10 CFR Part 50, Appendix A.) The existing regulations do not require explicitly that nuclear power plants be designed to assure that core cooling can be maintained for any specified period of loss of all ac power.

As operating experience has accumulated, the concern has arisen that the reliability of both the onsite and offsite emergency ac power systems might be less than originally anticipated, even for designs that meet the requirements of General Design Criteria 17 and 18. Many operating plants have experienced a total loss of offsite power, and more occurrences can be expected in the future. Also, operating experience with onsite emergency power systems has included many instances when diesel generators failed to start. In a few cases, there has been a complete loss of both the offsite and the onsite ac power systems. During these events, ac power was restored in a short time without any serious consequences.

In 1975, the results of the Reactor Safety Study (WASH-1400)¹ showed

¹ Copies of all NRC documents are available for public inspection and copying for a fee at the NRC Public Document Room at 1717 H Street, NW., Washington, DC 20555. Copies of published documents may also be purchased through the U.S. Government Printing Office by calling (202) 275-2060 or by writing to the Superintendent of Documents, U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013-7082.

that station blackout could be an important contributor to the total risk from nuclear power plant accidents. Although this total risk was found to be small and not undue, the relative importance of the station blackout accident was established. Subsequently, the Commission designated the issue of station blackout as an Unresolved Safety Issue (USI); a Task Action Plan (TAP A-44) was issued in July 1980, and studies were initiated to determine whether additional safety requirements were needed. Factors considered in the analysis of risk from station blackout included: (1) the likelihood and duration of the loss of offsite power; (2) the reliability of the onsite ac power system; and (3) the potential for severe accident sequences after a loss of all ac power, including consideration of the capability to remove core decay heat without ac power for a limited time period.

The technical findings of the staff's studies of the station blackout issue are presented in NUREG-1032, "Evaluation of Station Blackout Accidents at Nuclear Power Plants, Technical Findings Related to Unresolved Safety Issue A-44." Additional information is provided in supporting contractor reports: NUREG/CR-3228, "Station Blackout Accident Analyses," published in May 1983; NUREG/CR-2989, "Reliability of Emergency AC Power Systems at Nuclear Power Plants," published in July 1983; NUREG/CR-3992, "Collection and Evaluation of Complete and Partial Losses of Offsite Power at Nuclear Power Plants," published in February 1985; and NUREG/CR-4347, "Emergency Diesel Generator Operating Experience, 1961-1983," published in December 1985. The major results of these studies are given below.

- Losses of offsite power can be characterized as those resulting from plant-centered faults, utility grid blackout, and severe-weather-induced failures of offsite power sources. Based on operating experience, the frequency of total losses of offsite power in operating nuclear power plants was found to be about one per 10 site-years. The median restoration time was about one-half hour, and 90 percent of the offsite power losses were restored within approximately 3 hours (NUREG/CR-3992).

- The review of a number of representative designs of onsite emergency ac power systems has

indicated a variety of potentially important failure causes. However, no single improvement was identified that could result in a significant improvement in overall diesel generator reliability. Data obtained from operating experience in the period from 1976 to 1980 showed that the typical individual emergency diesel generator failure rate was about 2.5×10^{-3} per demand (i.e., one chance of failure in 40 demands), and that the emergency ac power system unavailability for a plant which has two emergency diesel generators, one of which was required for decay heat removal, was about 2×10^{-3} per demand (NUREG/CR-2989).

• Compared to the data in NUREG/CR-2989, updated estimates of emergency diesel generator failure rates indicated that diesel generator reliability has improved somewhat from 1976 to 1983. For the period 1981 to 1983, the mean failure rate for all demands was about 2.0×10^{-3} per demand (i.e., one chance of failure in 50 demands). However, the data also indicate that the probability of diesel generator failures during actual demands (i.e., during losses of offsite power) is greater than that during surveillance tests (NUREG/CR-4347).

• Given the occurrence of a station blackout, the likelihood of resultant core damage or core melt is dependent on the reliability and capability of decay heat removal systems that are not dependent on ac power. If sufficient ac-independent capability exists, additional time will be available to restore ac power needed for long-term cooling (NUREG/CR-3226).

• It was determined by reviewing design, operational and site-dependent factors that the expected frequency of core damage resulting from station blackout events could be maintained near 10^{-6} per reactor-year with readily achievable diesel generator reliabilities, provided that plants are designed to cope with station blackout for a specified duration. The duration for a specific plant is based on a comparison of the plant's characteristics to those factors that have been identified as the main contributors to risk from station blackout (NUREG-1632).

The staff's technical findings show that station blackout does not pose an undue risk to public health and safety. The findings summarized above show that recovery from loss of offsite power occurs for the most part in less than 4 hours, emergency diesel generator reliability is high (i.e., >0.95), and that given a station blackout the likelihood of core damage is more dependent on decay heat removal systems that are non-ac-dependent. However, plant

design and operational characteristics, plus site-dependent factors (such as anticipated weather conditions) introduce a level of variability which warrants a need for plant-specific coping analyses to provide greater assurance that core cooling can be maintained until ac power is restored. Thus the Commission believes that § 50.63 of 10 CFR Part 50 will bring about a significant increase in protection to the public health and safety. As a result of station blackout coping analyses, improved guidance will be provided to licensees regarding maintaining minimum emergency diesel generator reliability to minimize the probability of losing all ac power. In addition, the Commission is amending its regulations by adding a new § 50.63 to require that all nuclear power plants be capable of coping with a station blackout for some specified period of time. The period of time for a specific plant will be determined based on a comparison of the individual plant's design with factors that have been identified as the main contributions to risk of core damage resulting from station blackout.

These factors, which vary significantly from plant to plant because of considerable differences in design of plant electric power systems as well as site-specific considerations, include: (1) Redundancy of onsite emergency ac power sources (i.e., number of sources minus the number needed for decay heat removal), (2) reliability of onsite emergency ac power sources (usually diesel generators), (3) frequency of loss of offsite power, and (4) probable time to restore offsite power. The frequency of loss of, and time to restore, offsite power are related to grid and switchyard reliabilities, historical weather data for severe storms, and the availability of nearby alternate power sources (e.g., gas turbines). Experience has shown that long duration offsite power outages are caused primarily by severe storms (hurricanes, ice, snow, etc.).

The objective of the rule is to reduce the risk of severe accidents resulting from station blackout by maintaining highly reliable ac electric power systems and, as additional defense-in-depth, assuring that plants can cope with a station blackout for some period of time. The rule requires all plants to be able to cope with a station blackout for a specified acceptable duration selected on a plant-specific basis. All licensees and applicants are required to assess the capability of their plants to cope with a station blackout (i.e., determine that the plant can maintain core cooling with ac power unavailable for an

acceptable period of time), and to have procedures and training to cope with such an event. Licensees may use an alternate ac power source if that source meets specific criteria for independence and capacity and can be shown to be available within one hour to cope with a station blackout. A coping analysis is not required for those plants that choose this alternate ac approach if the alternate ac can be demonstrated by test to be available to power the shutdown buses within 10 minutes of the onset of station blackout. Use of an alternative ac source, one that minimizes common mode failure, is a preferred option since this approach will also benefit other safety concerns.

On the basis of station blackout studies conducted for USI A-44 and presented in the reports referenced above, the NRC staff has developed Regulatory Guide 1.155 entitled "Station Blackout," which presents guidance on (1) maintaining a high level of reliability for emergency diesel generators, (2) developing procedures and training to restore offsite and onsite emergency ac power should either one or both become unavailable, and (3) selecting a plant-specific acceptable station blackout duration which the plant would be capable of surviving without core damage. Application of the methods in this guide would result in selection of an acceptable station blackout duration (e.g., 2, 4, 8, or 16 hours) which depended on the specific plant design and site-related characteristics acceptable to the staff. However, applicants and licensees could propose alternative methods to those specified in the regulatory guide in order to justify other acceptable durations for station blackout capability. Additionally, the regulatory guide on station blackout presents guidance on quality assurance and specifications for alternate ac source(s) and non-safety-related equipment required for coping with station blackout. The equipment installed to meet the station blackout rule must be implemented so that it does not degrade the existing safety-related systems. This is to be accomplished by making the non-safety-related equipment independent to the extent practicable from existing safety-related systems. The guidance provided in the regulatory guide illustrates the specifications that the staff would find acceptable for non-safety systems and equipment. The quality assurance guidance for the non-safety-related equipment for which there are no existing NRC quality assurance requirements (e.g., Appendix B, Appendix R) embody the following elements: (1) Design control and

procurement document control, (2) instructions, procedures and drawings, (3) control of purchased material, equipment and services, (4) inspection, (5) test and test control, (6) inspection, test and operating status, (7) non-conforming items, (8) corrective action, (9) records, (10) audits. NRC inspections will focus on the implementation and the effectiveness of these quality controls as described in the regulatory guide.

Based on the rule and regulatory guide, those plants with an already low risk from station blackout would be required to withstand a station blackout for a relatively short period of time and probably would need few, if any, modifications as a result of the rule. Plants with currently higher risk from station blackout would be required to withstand somewhat longer duration blackouts. Depending on their existing capability, these plants might need to make hardware modifications (such as increasing station battery capacity or condensate storage tank capacity) in order to cope with the longer station blackout duration. The rule requires that each light-water-cooled nuclear power plant licensed to operate must be able to withstand for a specified duration and recover from a station blackout. The rule requires each plant to perform a coping analysis and identify the coping duration, along with the basis therefor and a description of procedures established for coping and recovery. If modifications to equipment or plant procedures are necessary, these are to be identified and a schedule provided for implementing such changes.

It should be noted, based on all evidence that staff has on hand, that no undue risk exists with, or without, the promulgation of the station blackout rule. However, station blackout may still remain an important contributor to residual risk. This station blackout rule will enhance safety by accident prevention and thereby reduce the likelihood of a core damage accident being caused by a station blackout occurrence. This does not mean, however, that further enhancements in reducing the overall residual risk are not achievable by additional improvements in severe accident management, given the assumption that core damage occurs, whether from station blackout sequences or other causes (such as small or large loss-of-coolant accident sequences). Initiatives that provide such safety enhancements (through improvements of core damage management procedures) are currently being pursued apart from the station blackout rule. Therefore, this rule should

be viewed as being in the same accident prevention context as the ATWS rule (§ 50.82) and the fire protection rule (§ 50.48) in that it recognizes, as the other two rules recognize, multiple failure possibilities resulting from common cause effects that should be addressed. This concern has been recognized in the Introduction to Appendix A of 10 CFR Part 50.

Proposed Rule

On March 21, 1988, the Commission published a proposed rule in the Federal Register (51 FR 9829) that would require (1) light-water-cooled nuclear power plants to be capable of coping with a station blackout for a specified duration, and (2) licensees to determine the maximum duration for which their plants as currently designed are able to cope with a station blackout. A 90-day comment period expired on June 19, 1988.

On April 3, 1988 (13 days after the proposed rule was published), the NRC published in the Federal Register (51 FR 21494) a notice of availability and request for comments on a draft regulatory guide entitled "Station Blackout" (Task SI 501-4). This draft guide provided guidance for licensees to comply with the proposed station blackout rule. Many letters commenting on the proposed rule also included comments on the draft regulatory guide. Responses to these comments provided below address the public comments on the draft guide as well as on the proposed rule.

Comments on the Proposed Rule

The Commission receives 53 letters commenting on the proposed rule.³ Forty-five of these were from the nuclear industry, comprised of electric utilities, consortiums of electric utilities, vendors, a trade association, and an architect/engineering firm. Other letters were submitted by the Union of Concerned Scientists, the Department of Nuclear Safety of the State of Illinois, a representative of the Professional Reactor Operator Society, a citizens group, a consultant, and three individuals. Largely, the industry comments were opposed to generic rulemaking to resolve the station blackout issue. The Nuclear Management and Resources Council (NUMARC), formerly the Nuclear Utilities Management and Resources Committee, submitted, along with its comments on the proposed rule, a set of four industry initiatives that it believes

would resolve this issue without rulemaking. Thirty-nine of the industry letters supported NUMARC's submittal. NUMARC proposed a fifth initiative (see item 21) by letter dated October 6, 1987. On the other hand, the Union of Concerned Scientists, the Illinois Department of Nuclear Safety, and the citizens group supported the Commission's objective in the proposed rule, but did not believe the rule and guidance associated with the rule went far enough to reduce the possibility of a serious accident that could be initiated by a total loss of ac power.

Every letter was reviewed and considered by the staff in formulating the final resolution of USI A-44. Because of the large number of comments, it was not practical to prepare formal responses to each one separately. However, since many comments were on similar subjects, the discussion and response to the comments have been grouped into the following subjects:⁴

1. Quality classification of modifications.
2. Whether the backfit analysis adequately implements the Backfit Rule.
3. Cost-benefit and whether § 50.63 meets "substantial increase in the overall protection of the public health and safety".
4. Whether NRC should require substantial improvements in safety that go beyond those proposed in this rulemaking.
5. The need for generic rulemaking.
6. Applicability of the proposed § 50.63 to specific plants.
7. Plant-specific features and capabilities.
8. The source term used to estimate consequences.
9. Specificity on the extent of required coping studies.
10. Acceptable duration for coping with a station blackout.
11. Credit for alternate or diverse ac power sources.
12. Trends on the reliability of ac power sources.
13. Sharing of emergency diesel generators between units at multi-unit sites.
14. Certification of the definitions of station blackout and diesel generator failure.
15. Specificity and clarification of requirements.
16. Technical comments on NUREG-1032.
17. Relationship of USI A-44 to other NRC Generic Issues.
18. An alternative of plant-specific probabilistic assessments.
19. Procedures and operator actions during station blackout.
20. Schedule provisions in the proposed § 50.63.
21. Industry initiatives.

The comments and responses to each of these subjects are presented on the following pages.

³ Copies are available for public inspection and copying for a fee at the NRC Public Document Room at 1717 H Street, NW, Washington, DC.

⁴ The first four subjects are ones on which the Commissioners specifically requested public comments when the proposed rule was published.

1. Quality Classification of Modifications

The Commission requested comments on whether the staff should give further consideration to upgrading to safety grade the plant modifications needed (if any) to meet the proposed rule. Upgrading to safety grade would further ensure appropriate licensee attention is paid to maintaining equipment in a high state of operability and reliability.

Comments—The prevailing view by industry on this subject is represented by the following comments submitted by NUMARC:

Quality classification is unnecessary—Equipment used to prevent or respond to a station blackout should be sufficiently available and operable to meet its required function. To this extent, the Commission's desire that appropriate attention be paid to maintaining a sufficiently high state of operability and reliability is appropriate. The point of departure begins with the method for achieving this objective. Specifically, by itself, a "safety grade" classification scheme does not solely equate with high states of equipment operability and reliability. Such classification systems too often can become a documentation exercise more than a process for providing the requisite level of system functionality.

Duquesne Light agreed with this view and expressed the following comments:

Any plant modifications or additional equipment required to meet the proposed rule should not be specified safety grade. For equipment which is to be manually started and placed in service for testing or in the event of a loss of power condition there is no necessity for specifying safety grade since adequate reliability can be obtained through normal surveillance testing and the proper maintenance of commercial power plant equipment. The cost difference in safety grade vs. commercial grade modifications is significant and must be emphasized.

The opposite point of view was taken by the Illinois Department of Nuclear Safety.

No credit should be given for the capability of equipment to respond to a station blackout unless the equipment was originally designed, constructed, inspected, performance tested, qualified, certified for the intended safety-related purpose, and the equipment is maintained to the highest industry safety standard.

Gulf States Utilities commented,

The proposed rule does not provide sufficient direction on the quality classification of plant modifications that may be required to meet the rule. . . . the quality classification of plant modifications implemented to meet the proposed rule should be commensurate with classification of the system they support.

Response—The proposed § 50.83 does not specifically address the topic of safety classification of plant

modifications; however, detailed guidance is provided in Regulatory Guide 1.155 dealing with quality assurance and equipment specifications for non-safety-related equipment. Any safety-related equipment used either presently, or in modifications resulting from this rule, should meet the criteria currently applied to such equipment.

The technical analyses performed for USI A-44 (NUREG-1032) show that plant-centered events (i.e., those events in which design and operational characteristics of the plant itself play a role in the likelihood of loss of offsite power), and area- or weather-related events (e.g., grid reliability or external influences on the grid) are the dominant causes of loss of offsite power. Neither seismic events nor events related to single failure causes were found to be major contributions to loss of offsite power. Therefore, both the staff's findings and public comments received do not support an explicit need for plant modifications for coping with station blackout to be seismically qualified.

The substantial increase in protection sought by this rule can be achieved by modifications which meet criteria somewhat less stringent than generally required by safety grade criteria. Safety-related equipment modifications to meet all safety-grade-related criteria would be more burdensome and expensive and would likely achieve only a very small further reduction in risk. The major contributors to the residual risk of loss of offsite power are adequately dealt with by modifications which conform to the quality assurance and equipment specification guidance provided in Regulatory Guide 1.155.

2. Whether the Backfit Analysis Adequately Implements the Backfit Rule

In addition to comments on the merits of the proposed rule, the Commission specifically requested comments on whether the backfit analysis for this rule adequately implements the Backfit Rule, § 50.109 of 10 CFR Part 50.

Comments—The Commission received two differing views in response to this request. On one hand, NUMARC expressed the view that the proposed rule does not meet the backfit rule standard because the analysis of the factors set forth in § 50.109(c) were not adequately considered by the staff. Specifically, NUMARC stated:

1. Installation and continuing costs associated with the backfit have been underestimated.

2. Potential impacts on radiological exposure of facility employees should be further addressed.

3. The relationship to proposed and existing regulatory requirements should be considered further.

4. Potential impacts of differences in facility, type, design, or age should be considered further.

5. The reduction in risk from offsite releases to the public has been overestimated.

On the other hand, the Ohio Citizens for Responsible Energy (OCRE) and the Union of Concerned Scientists commented that the backfit rule should not apply to the proposed rule. OCRE took the position that "application of the backfit rule to [NRC] rulemaking is plainly illegal," and the Commission is not empowered to consider costs to licensees in deciding whether to impose new requirements. The Union of Concerned Scientists commented that the cost-benefit analysis should not be applied in this case because safety improvements are needed to secure compliance with existing NRC regulations, specifically General Design Criterion 17, Electric Power Systems (Appendix A to 10 CFR Part 50).

Response—NUMARC's comments on the backfit analysis were taken into account by the staff in revising the draft version of NUREG-1109, "Regulatory Backfit Analysis for the Resolution of Unresolved Safety Issue A-44, Station Blackout," and a separate appendix that addresses the factors in § 50.109(c) was added to that report. All but Item 2 above are on the same subjects as letters from other commenters and are discussed in more detail under subjects 3 (Item 1), 6 (Item 4), 8 (Item 5), and 17 (Item 3) in this section. NUMARC's Item 2, the potential impact on radiological exposure of facility employees, would need to be assessed in detail only if it were a major factor in the value-impact analysis. The effect of radiological exposure on facility employees, if any, would be extremely small in comparison to the reduction in radiological exposure to the public from accident avoidance. Therefore, this factor would have no impact on the overall value-impact analysis.

Contrary to OCRE's and the Union of Concerned Scientists' comments, the Commission may subject the rulemaking process to internal controls. Moreover, the Commission is empowered to consider the costs of incremental safety improvements which go beyond the level of safety necessary to ensure no undue risk to the public health and safety. See *UCS, et al., v. NRC*, D.C. Cir. Nos. 85-1757 and 88-1219 (August 4, 1987). The improvements embodied in § 50.83 go beyond the level of safety necessary to ensure no undue risk.

Finally, contrary to the Union of Concerned Scientists' comment on GDC 17, new station blackout measures cannot be imposed on licensees as a matter of compliance with GDC 17, under the compliance exception in the backfit rule, § 50.109(a)(4)(i). GDC 17 does not explicitly require that each plant be able to withstand station blackout for a specified time, or that each licensee perform a coping assessment and make whatever modifications may be necessary in the light of that assessment. Nor are any of these highly specific requirements logically compelled by any part of GDC 17. Moreover, GDC 17 has never been interpreted by the staff or the Commission to contain these specific requirements. Thus, to impose them under GDC 17 would amount to a backfit which resulted from a new staff and Commission interpretation of GDC 17.

The issue in this rulemaking is whether some additional protection is warranted beyond that already provided. The Commission is entitled to inquire, and seek public comment on, whether additional safety measures should be imposed where there is a substantial increase in the overall protection of public health and safety and the cost of implementation is justified in view of this increased protection.

3. Cost-Benefit Analysis and Whether § 50.63 Meets the "Substantial Increase in the Overall Protection of the Public Health and Safety"

Chairman Zech and Commissioner Roberts requested comments on the analysis of cost benefit, value impact, and safety improvements and the station blackout standing on the overall risk (e.g., is the reduction of risk only a small percentage of the overall risk or is it a major component of an already small risk?). Chairman Zech and Commissioner Roberts were particularly interested in specific comments assessing whether or not this proposal meets the "substantial increase in the overall protection of the public health and safety" threshold now required by the backfit rule.

Comments. One of the major comments by industry on the cost-benefit analysis was that the costs of implementing the proposed requirements have been underestimated. NUMARC and the Atomic Industrial Forum (AIF) commented that the cost estimates for hardware modifications reported in NUREG/CR-3840, "Cost Analysis for Potential Modifications To Enhance the Ability of a Nuclear Plant To Endure Station Blackout," were too

low. Commonwealth Edison and other utilities felt that performance of an analysis to determine the maximum duration a nuclear plant could cope with a station blackout would be substantially costlier than what is estimated in NUREG-1109. Industry also expressed concern that the interpretations associated with the proposed rule could lead to substantial costs above those addressed by the NRC staff in its backfit analysis. AIF commented that "The estimate of 120 NRC man-hours per plant [for NRC review] * * * appears inadequate to account for technical review and evaluation of the determination of maximum coping capability and of the description of station blackout procedures which the rule would require each licensee to submit."

(B) Several commenters expressed the view that the NRC failed to consider all the risks associated with a station blackout in its value-impact assessment. The Union of Concerned Scientists thought independent failures, in addition to failures that lead to a station blackout, should be included. One individual stated that "both NRC reports (NUREG-1109 and NUREG-1032) are completely deficient in that neither look at sabotage." OCRE commented that seismic events should also be considered.

(C) With respect to safety improvements and overall risk, different points of view were expressed. On one hand, NUMARC commented that, while the risk reduction might be large for a limited number of plants, the risk reduction associated with the majority of plants will be small. Thus, as a general matter, the reductions in risk offered by the proposed rule constitute a small percentage of the overall risk, a risk which is already small (and acceptable). AIF stated that there is no standard by which to conclude that "substantial additional protection will be realized."

A different view was expressed by the Union of Concerned Scientists who stated that "station blackout is clearly a major component of the total risk posed by operating nuclear plants. The magnitude of the total risk is largely unknowable due to the enormous uncertainty which surrounds probabilistic assessments."

Response.—(A) In order to adequately respond to industry's comments above, the staff and NRC contractors reviewed the cost estimates associated with implementing the station blackout rule. Based on this review, the estimated costs for hardware modifications were reviewed and are in the range of from 20

percent to almost 140 percent greater than the estimates in NUREG/CR-3840, depending on the specific modification considered. On average, the cost estimates for hardware backfit were found to be approximately 80 percent greater than estimated in NUREG/CR-3840. However, the cost estimates in NUREG/CR-3840 were not used by the staff in the value-impact analysis in the draft version of NUREG-1109 where estimates approximately 100 percent greater than the NUREG/CR-3840 estimates were used. Therefore, the revised cost estimates used in the final value-impact analysis are not significantly different from the estimates used in the draft version.

Industry's comments on the costs to assess a plant's capability to cope with a station blackout were based on the proposed rule that required an assessment of the maximum coping capability and the potentially unbounded nature of such an assessment. Based on public comments, the Commission has revised the final rule to modify the requirement for licensees to determine the maximum coping capability. (See response to public comments in subject number 9.) Instead, a coping assessment is required only for a specific duration. The cost for such a study is estimated to be from 70 to 100 percent higher than the original estimates by the staff, and these revised costs are used in the final value-impact analysis.

The staff revised its estimate of the resource burden on NRC for review from 120 to 175 person-hours per reactor. This revision was based on technical review required for other comparable NRC activities.

(B) The technical analyses performed for USI A-44 indicated that the contribution to core damage frequency from independent failures, in addition to failures that must occur to get to a station blackout, is low. Likewise, results of USI A-44 studies and other probabilistic risk assessments have shown that, for station blackout sequences, the contribution to core damage frequency from seismic events is low.

Not all events can be analyzed on a probabilistic basis. Sabotage is an example. Even though sabotage was not explicitly considered in the staff's value-impact analysis, it is discussed in NUREG-1109 under other considerations. These considerations support the conclusion that a station blackout rule will provide a substantial safety benefit.

(C) The revised value-impact analysis performed for the resolution of USI A-44

indicates that there are substantial benefits in terms of reduced core damage frequency and reduced risk to the public that result from the station blackout rule, and the costs are warranted in light of these benefits. The best estimate for the overall value-impact ratio is 2,400 person-rem per million dollars. Even if those plants with the highest risk (and therefore the greatest risk reduction) were not considered, the value-impact ratio for the remaining plants is still favorable (i.e., about 1,500 person-rem per million dollars).

Analyses reported in NUREG-1150, "Reactor Risk Reference Document" (draft issued for comment in February 1987),* indicate that station blackout is a dominant risk contributor to overall residual risk for most of the six plants analyzed. These results support the comment by the Union of Concerned Scientists in response to the Commissioner's request for comments on this subject.

4. Whether NRC Should Require Substantial Improvements in Safety that Go Beyond Those Proposed in this Rulemaking

Commissioner Asselstine requested comments on whether the NRC should require substantial improvements in safety with respect to station blackout, like those being accomplished in some other countries, which can be achieved at reasonable cost and which go beyond those proposed in this rulemaking.

Comments—NRC received eight letters that included comments on this subject. Five of these were from the nuclear industry, none of which felt that the approach to station blackout taken in European countries should be used to justify safety improvements that go beyond the proposed § 50.63. The main justification for industry's argument is that foreign countries may have reasons for requiring activities that differ from, or exceed, those in the U.S. For example, Washington Public Power Supply Systems (WPPSS) commented, "It is not apparent that the details of U.S. grid stabilities and onsite power reliabilities are substantially similar enough to those found abroad to warrant a simple adoption of those [European] measures."

In another comment from industry on this subject, NUMARC stated that there are several reasons why many of the features for coping with a station blackout in new French nuclear power plants may already exist at most U.S.

plants. In fact, they said, "The French approach to station blackout does not appear to depart significantly from current regulatory approaches in the U.S." Similarly, AIF stated, "The assertions of extensive station blackout coping capability at foreign (notably European) nuclear power plants are not sufficiently substantiated to serve as even part of the basis for the proposed requirements."

Three other letters (Union of Concerned Scientists, OCRE, and Illinois Department of Nuclear Safety) supported the NRC rulemaking to require all plants to be able to cope with a station blackout, but urged the Commission to go beyond the proposed rule. The Illinois Department of Nuclear Safety stated that:

The goal of holding the expected frequency of core damage from station blackout to 10^{-6} per reactor-year is not sufficiently stringent. With relatively modest modifications to the proposed rule, a frequency of 10^{-7} appears achievable at reasonable cost. Specifically, the rule should require no less than 20 hour decay heat removal capacity instead of only four or eight hours in the proposed rule. In the event of a blackout.

Response—The staff agrees with industry's comments that foreign countries may have valid reasons for imposing requirements that differ from or exceed those in the U.S. For example, it appears that there is a higher frequency of losses of offsite power in France than in the U.S. This experience, along with French safety objectives, led the French to design their new standard nuclear power plants to be able to cope with every-long duration station blackout (i.e., up to three days). The French safety approach and their station blackout design features are documented in NUREG-1206, "Analysis of French (Paluel) Pressurized Water Reactor Design Differences Compared to Current U.S. PWR Designs," June 1986.

The Commission believes that the staff has adequately considered foreign approaches in preventing core melt from station blackout in developing the resolution of USI A-44. Although the rule requires plants to be able to cope with station blackout for a specific duration, that duration is not specified in the rule. Guidance to determine an acceptable duration is included in Regulatory Guide 1.155. This guidance should apply to most plants, but if there were adequate justification, different requirements (either more or less stringent than the regulatory guide) could be applied to specific plants. The use of alternate ac sources provides a means to achieve further incremental decreases in core melt frequency.

5. The Need for Generic Rulemaking

Comments—Five letters from the nuclear industry commented that generic rulemaking is not necessary to resolve the station blackout issue. Their reasons for this issue were as follows:

A generic rulemaking is inappropriate since the historic number of sites experiencing a loss of all offsite power is small. (Texas Utilities)

The station blackout issue should be handled on a plant-specific basis and does not need to be resolved by generic rulemaking. Each plant has unique probability for a loss-of-power event based on transmission system, location of plant, and onsite power systems. (Duquesne Light)

The Commission need not pursue generic rulemaking in order to resolve a non-generic issue. In the proposed station blackout rule, the number of plants of concern is acknowledged to be limited. (NUMARC)

Station blackout has been found not to be a generic issue. Station blackout risk is plant specific and, according to the staff's own analyses, the proposed requirements are expected to result in modifications at no more than a few facilities, if at any. Requiring all licensees to undertake extensive analyses under the provisions of the proposed rules when only a small group of plants may have a need for remedial action is not appropriate. (AIF)

Response—The Commission believes that a rule is appropriate to ensure that station blackout is addressed at all nuclear power plants. The plant-specific features that contribute to risk for station blackout (e.g., diesel generator configuration, probability of loss of offsite power) are considered by the staff in the station blackout regulatory guide to determine an acceptable coping duration for each plant. Even though not all sites have experienced a loss of offsite power, there is not sufficient assurance that such events would not occur in the future. Since historic experience has shown that a total loss of offsite power occurs about once every 10 site-years, and many nuclear plants have operated for less than 10 years, it is not surprising that some plants have experienced a loss of offsite power while others have not.

Even though it is likely that many plants will not need hardware modifications to comply with the rule, the assessment of station blackout coping capability for a specific duration and implementation of associated procedures will affect a safety benefit for all plants. The "limited number of plants of concern" in NUMARC's letter refers to those plants having the highest risk from station blackout (i.e., those that would need hardware modifications). Without a plant-specific assessment, these plants can not be

* Free single copies may be obtained from the Division of Information Support Services, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

identified. Even excluding these plants from consideration, the staff's analysis has shown that the improvements in safety associated with the rule are consistent with backfit considerations set forth in § 50.109.

8. Applicability of the Proposed § 50.63 to Specific Plants

Comments—Four letters included comments or questions regarding the applicability of the rule to specific plants. For example, does the rule apply to high-temperature gas-cooled reactors (HTGR) (i.e., Fort St. Vrain)? What about TMI-2 or plants that are near completion but will not have an operating license prior to the amendment's effective date? Houston Power and Lighting Company wrote:

Proposed Section 50.63 provides scheduler guidance for implementing station blackout-related modifications on plants that already hold operating licenses or will be licensed to operate prior to the effective date of the amendment. Plants who may be NTOL's (near-term operating license) but will not be licensed prior to the amendment's effective date should be accorded the same compliance period under parts (c) and (d) of this section. Otherwise this proposed rule could be interpreted to imply that plants not licensed prior to the effective amendment date must comply with the rule and make all necessary modifications prior to receiving an O.L. [operating license]. The rule should be amended to address plants which are scheduled to receive an O.L. within a short time following implementation of this rule.

Response—Rather than identifying specific plants for which the rule does not apply, § 50.63(a) specifies when it does apply (i.e., "each light-water-cooled nuclear power plant licensed to operate"). Since Fort St. Vrain is an HTGR, the generic rule would not apply. Station blackout will be considered individually for that plant based on its unique design. Since TMI-2 is not licensed to operate, likewise the rule would not apply to that plant. Any plant licensed to operate after the date the rule becomes effective will comply with the same 270-day schedule for information submitted applied to plants previously licensed. This affords NTOLs the same compliance features as plants already licensed to operate.

7. Plant-Specific Features and Capabilities

Comments—A number of utilities described plant-specific features and capabilities that reduced the risk posed by a station blackout event compared to the staff's analysis. Examples of such features are given below.

- Availability of alternate, independent ac power sources such as

diesel generators, gas turbines, or nearby "black start" ac power sources.

- Extremely reliable offsite power supplies because of multiple right-of-ways or underground feeders to back up above ground transmission lines.

- Dedicated shutdown systems and associated diesel generators to meet the fire protection requirements of Appendix R to 10 CFR Part 50.

- Common or shared systems between two units at multi-unit sites such as direct current (dc) power, auxiliary feedwater, or diesel generators.

Response—The analyses performed for USI A-44 clearly show that plant-specific features do affect the risk from station blackout, and the station blackout regulatory guide takes this into account in providing guidance on different acceptable coping durations depending on the most significant of these features. Those plants with extremely reliable offsite and onsite ac power supplies need only have a very short (e.g., 2-hour) coping duration to be acceptable. Plants that have a dedicated shutdown system with its own independent power supply could take credit for this system to cope with a station blackout. The final rule and Regulatory Guide 1.155 have been clarified to give credit for alternate ac power supplies (see response to subject 11).

Therefore, the Commission believes that for almost all cases, plant-specific differences have been adequately accounted for in the resolution of USI A-44, but the door is open to licensees who believe their plants have additional capabilities that should be considered by the staff in demonstrating compliance with the rule.

8. The Source Term Used To Estimate Consequences

Comments—NUMARC and others in the industry commented that the consequences of offsite releases that would result from a station blackout event are overestimated, and new source term information would lead to the prediction of much lower consequences for this event. Several commenters felt that the approach taken by the staff to estimate consequences of a station blackout event was improper—decreasing by a factor of three the estimated consequences of the siting source term (SST1) from NUREG/CR-2723, "Estimates of the Financial Consequences of Nuclear Power Reactor Accidents" (September 1982).

AIF felt that "implementation of any requirements resulting from the resolution of USI A-44 should be deferred until the results of the source

term research can be taken into account." They based this statement on the premise that if the consequences used in the staff's value-impact analysis were reduced by a factor of 10, none of the alternatives would be feasible.

The Union of Concerned Scientists expressed a different point of view in their letter which said " . . . available evidence indicates that the consequences of an accident involving station blackout may be even worse than those estimated either in WASH-1400 or the NRC's more recent studies."

Response—NRC has had an extensive research effort underway since about 1981 to evaluate severe accident source terms. The staff has reviewed the results of this research to take into account the public comments received on this subject. Since there is still a great deal of uncertainty regarding source terms and associated consequences, the staff revised its value-impact analysis for USI A-44 considering a range of estimates for consequences of a station blackout.

The NRC research on severe accident source terms has resulted in the development of significant new analytical tools by NRC contractors, as discussed in NUREG-0958, "Reassessment of the Technical Bases for Estimating Source Terms," July 1986. The analytical methods developed, generally referred to as the Source Term Code Package (STCP), have been used to analyze a number of severe accident sequences for five reference plants, namely: Peach Bottom, a BWR Mark I design; Sequoyah, a PWR ice condenser; Surry, a PWR with a sub-atmospheric containment; Grand Gulf, a BWR with a Mark III containment; and Zion, a PWR with a large dry containment (NUREG-1150, "Reactor Risk Reference Document," Draft for Comment, February 1987).

The results of these analyses show that releases from station blackout sequences can be expected to vary significantly depending upon the plant and the specific sequence. Although generalizations are difficult, it appears that calculations using the STCP yield release fractions for most of the sequences range from about one third of an SST1 release (for the case of Surry, without condensation) to roughly one order of magnitude less than this. However, the uncertainties in our present understanding also do not preclude the possibility of a large release, approaching that of the SST1 estimate.

To determine the consequences in terms of person-rem, given the above range of release fractions, data taken from NUREG/CR-2723 indicate that the

variations in person-rem associated with releases of magnitude SST1, SST2 and SST3 are virtually identical to the variations in latent cancer fatalities for the same three releases. Hence, the estimated change in latent cancer fatalities with release fractions provides a reliable indication of change in person-rem as well.

Table 10 in NUREG/CR-2723 presents variations in estimated latent cancer fatalities associated with changes in SST1 release fractions (for all elements except noble gases). This table shows that a release fraction of one-third of an SST1 release would yield a value of about 50 percent of the latent cancer fatalities (and person-rem) of an SST1 release. Similarly, a release fraction of one-third of an SST1 release would yield an estimated person-rem of about 15 percent of that associated with an SST1 release. Consequently, for value-impact calculations, the staff estimated the range of consequences of station blackout, in terms of person-rem, to be from 0.15 to 0.5 of the estimated person-rem of an SST1 release. As noted, the original value-impact analysis was based on 0.3 times the estimated person-rem of an SST1 release.

With regard to a possible delay in the resolution of USI A-44 until "better" source terms become available, key considerations appear to be when better source terms are likely to become available and to what degree uncertainties in phenomenology as well as differences between investigators will be resolved. Although research on source terms is expected to continue well into the future, improvements in our knowledge are expected to be largely evolutionary beyond this point, in that the major phenomena appear to have been accounted for, at least in a first-order fashion, both in NRC as well as industry models. Resolution and narrowing of the remaining uncertainties would also benefit from improved experiments and analytical models that are likely to become available gradually. For these reasons, significantly better source terms than those presently available are likely to be forthcoming only after a number of years. Since the range of severe accident source terms and consequences suggested above from estimating station blackout sequences is sufficiently broad to cover likely improvements in source term knowledge, the resolution of USI A-44 should not be delayed.

9. Specificity on the Extent of Required Coping Studies

Comments—Several letters by industry expressed concern that the studies necessary to demonstrate that a

plant can cope with a station blackout are not well defined and could potentially be unbounded. These comments focused on two main points. First, the proposed rule required plants to determine the maximum duration the plant could cope with a station blackout, yet the draft regulatory guide included specific guidance on acceptable coping durations (e.g., 4 or 8 hours). Determining the maximum duration, rather than assessing the plant's capability for a specific acceptable duration, could be an open-ended requirement. Along these lines, NUMARC stated:

Unless the required coping demonstration is specifically bounded by clearly stated definitions, assumptions, and criteria, there could conceivably be hundreds of supporting special effects analyses which licensees may have to consider as a result of the exercise of discretion by individual staff reviewers. Under the rule as proposed, licensees cannot ascertain the ultimate requirements they will be expected to meet (including the potential plant modifications they will need to make) to demonstrate compliance.

Second, industry also commented on the potential open-endedness of analyses to determine the operability of equipment in environmental conditions resulting from a station blackout (e.g., without heating, ventilation and air conditioning). Unless these analyses were well defined, industry felt the analyses could be much more costly than estimated by the staff. However, NUMARC made the following statement relating to the need for detailed prescriptive requirements by NRC that appears to contradict their earlier statement:

The point is not that regulations must be prescriptive by their very nature. Prescriptive regulations, which outline in detail exactly what steps are required by licensees to satisfy a proposed regulation, are, in many instances, unnecessary and counterproductive.

Response—With regard to the proposed requirement that each plant determine its maximum duration for coping with station blackout, the staff agrees with the industry comments. First of all, it would be difficult to adequately define "maximum duration" in this sense. Second, if licensees determine that their plants can cope with a station blackout for a specified duration and restore ac power through an acceptable coping analysis, the additional safety benefit gained from simply the knowledge that a longer, or "maximum duration," coping duration exists is small. Third, the costs for assessing "maximum duration" will be higher since more extensive analyses will be required to analyze a transient which

would go beyond the coping analysis for a specified duration and recovery from station blackout. Therefore, the rule and regulatory guide have been revised accordingly to delete the requirement for licensees to determine a plant's maximum coping capability.

With regard to the comments on assessments to determine equipment operability during a station blackout, the staff feels strongly that such assessments are necessary to determine a plant's response to station blackout. By deleting the requirement to determine a plant's "maximum" coping capability, the assessment of equipment operability would not be as costly as assumed by industry. Guidance on acceptable coping assessments is provided in the station blackout regulatory guide. Also, guidelines to evaluate the effects of loss of ventilation under station blackout conditions are provided in Appendix E of NUMARC-8700, "Guidelines and Technical Bases for NUMARC Initiative Addressing Station Blackout at Light Water Reactors." These efforts provide additional definitions, criteria, and standards for licensees' assessments of equipment operability without the need for "prescriptive regulations" by NRC.

In order to further evaluate industry's comments on this subject, NRC requested Sandia National Laboratories to identify specific tasks necessary to determine operability of equipment during a station blackout and to estimate the cost to perform these tasks. Results of this study were used in the revised value-impact analysis performed for this issue ("Equipment Operability During Station Blackout Event," NUREG/CR-4842).

10. Acceptable Duration for Coping with a Station Blackout

Comments—Several comments with differing views were directed at guidance in the draft regulatory guide on acceptable station blackout coping durations in order for plants to comply with the proposed rule.

Washington Public Power Supply commented that "it should be possible for certain utilities to demonstrate [an acceptable] zero hour blackout." One individual recommended "that a 30 minute period be a margin, and that no duration under 4 hours be accepted by the staff." NucleDyne Engineering commented that "advanced reactors should require the capability to safely withstand a station blackout of at least 8 hours," and the Illinois Department of Nuclear Safety wrote that "the rule should require no less than 20 hours

heat removal capability instead of 4 or 8 hours."

Response—Although diverse comments were received on this subject, none provided supporting analysis or information to back up the opinions expressed. However, the staff did reanalyze the estimated risk from station blackout events for different plant- and site-related characteristics and revised its guidance on acceptable coping duration accordingly based on a goal of limiting the average contribution to core damage from station blackout to about 10^{-4} per reactor-year. Most plants would still need a 4- or 8-hour coping capability. Those few plants with the most redundant onsite emergency ac power system, coincident with significantly lower than average expected frequency of loss of offsite power, would need only a 2-hour capability to be acceptable. Any plant with minimum redundancy in the onsite emergency ac power system coincident with low reliability and a significantly higher than average expected frequency of loss of offsite power would need to substantially improve its ac power reliability or be able to cope with a station blackout for 16 hours.

11. Credit for Alternate or Diverse AC Power Sources

Comments—Ten letters from the utility industry commented that more credit should be allowed for the availability of alternate power sources such as onsite gas turbines. The comments below represent the utilities' viewpoint.

The station blackout rule should be clarified to allow credit for diverse and very reliable offsite power sources or diverse and very reliable onsite electrical generation. (Public Service Company of Colorado)

The option of providing an additional alternate source of ac power is eliminated by [the proposed resolution]. The inconsistency in this approach can best be understood by considering an example at a generic nuclear power station. (Toledo Edison)

If the licensee were to provide an additional independence diesel generator capable of providing the necessary ac power to prevent station blackout, the licensee . . . would still be required to withstand at least 4 hours without ac power. They would receive no credit for the additional diesel generator in the coping analysis. If the licensee were to use that same diesel engine to power a charging pump, even though it would be of less significance to mitigation of reactor core damage than the diesel generator, the licensee could take credit for it in coping with the blackout. (Toledo Edison)

Since a diesel-powered charging pump will not provide for equipment loading flexibility, lighting, ventilation, instrumentation, etc., it is obviously of lower value than an additional source of ac power. The fixed category

approach taken in [the proposed resolution], however, will not permit taking credit for the same diesel engine when used as a generator though the actual reliability for the machine is the same. (Toledo Edison)

Response—The proposed regulation did not intend to ignore the alternative of adding additional power sources or taking credit for such sources if they already exist. For example, as specified in the regulatory guide, if a licensee added an emergency diesel generator to one of its plants that had minimum redundancy in the onsite emergency ac power system, the acceptable station blackout coping duration could be reduced. For some plants, however, adding a diesel generator would not result in a reduction in the acceptable coping duration, and the point made by Toledo Edison is a valid one. The rule and regulatory guide have been revised to clarify that alternate ac power sources are given credit to cope with a station blackout provided that certain criteria are met (e.g., independence, redundancy, high reliability, maintenance, and testing).

12. Trends on the Reliability of AC Power Sources

Comments—Five letters included comments on the reliability of ac power sources. Four letters from industry felt that improved ac power reliability should be factored into the staff's technical analysis. Examples of these comments include the following:

... the frequency of loss of offsite power activities has been decreasing . . .

(Washington Public Power Supply System);

... offsite power availability in the absence of regulation has significantly improved over the past decade. (Southern California Edison Company);

[NUREG/CR-4347] . . . shows an improvement in diesel generator reliability over that shown in the earlier document [NUREG/CR-2989] (General Electric); and

Typically the reliability of onsite power systems increases during the first few years following startup. (Gulf States Utilities)

The Illinois Department of Nuclear Safety, on the other hand, felt that potential vulnerabilities still exist in onsite emergency ac power systems, and licensees should demonstrate that they have taken steps to reduce the probability of loss of ac power.

Response—The staff and its contractors have extensively analyzed the industry experience and trends in ac power reliability as documented in NUREG-1032, NUREG/CR-2989, NUREG/CR-3992, and NUREG/CR-4347. Trends have shown that two aspects of ac power reliability have improved somewhat—the reduced frequency of losses of offsite power due

to plant-centered events, and a slight improvement in average diesel generator reliability from 1976 through 1983. These factors have been taken into account in the staff's analyses and the resolution of USI A-44. However, data also demonstrate that there are practical limits on ac power reliability, and the defense-in-depth approach of being able to cope with a station blackout is warranted.

13. Sharing of Emergency Diesel Generators Between Units at Multi-Unit Sites

Comments—Several letters from industry stated that some plants with two units on a site have the capability to cross-tie electrical buses between units and therefore have improved flexibility in providing ac power. Since the magnitude of the electrical loads necessary to provide core cooling during a station blackout is significantly less than that required for a design basis accident, it could be possible to provide ac power to both units at the site using only a single diesel generator.

Response—The proposed rule and draft regulatory guide do not prohibit the approach discussed above. If licensees can demonstrate that such cross-tie capability exists, procedures are in place to accomplish the cross-tie and shed nonessential loads (if necessary), and no NRC regulations are violated (such as separation, minimum redundancy, and independence), then credit would be given for this capability as shown in Regulatory Guide 1.155 (i.e., reduced acceptable station blackout coping durations for greater diesel generator redundancy).

14. Clarification of the Definitions of Station Blackout and Diesel Generator Failures

Comments—(A) Three commenters from the utility industry recommended that the definition of station blackout in § 50.2 should be clarified to exclude ac power from the station batteries through inverters. This source of ac power from the station batteries would be available in the event of a loss of both the offsite and onsite emergency ac power sources (i.e., diesel generators).

(B) Several from industry commented that the definition of diesel generator failure should be clarified, particularly with respect to the treatment of short-term failures that can be recovered quickly. Sargent and Lundy Engineers commented that:

A definition of failure on demand for emergency diesel generators needs to be provided. Under the context of a station blackout, a diesel generator which fails to

start automatically upon detection of an offsite power loss, but is successfully started manually from the main control room or from the local control panel, should not be considered a failure on demand.

Response—(A) The staff agrees with comment A and revised the definition of station blackout accordingly.

(B) Based on actual experience, failures of diesel generators to start due to failures in the auto-start system make up less than 20 percent of all diesel generator failures. Therefore, discounting these failures would not have a significant impact on overall diesel generator reliability statistics. However, the staff agrees in principle with comment B and has clarified the station blackout regulatory guide so that auto-start failures of diesel generators need not be counted in determining the failure rate if the diesel generator is capable of being started manually immediately after it does not start automatically.

15. Specificity and Clarification of Requirements

Comments—Public comments were received regarding the specificity and clarification of the proposed rule and draft regulatory guide. These ranged from general to specific comments as the following two excerpts indicate:

We are concerned that, if the proposed rule is adopted, the staff will promulgate regulatory guidance criteria which will be unrealistic and excessive, i.e., compounding the event with other accidents, imposing passive failure criteria, applying seismic, environmental qualification and other qualifications to equipment that could otherwise be used in response to such an event, etc. (Maine Yankee Atomic Power Company)

Definitions of P1 and P2 (in Table 3 of the draft Regulatory Guide) use frequency of extremely severe weather and severe weather interchangeably, thus creating confusion in the definition. (Washington Public Supply System)

Response—Some of the comments on this subject relate to other subjects discussed elsewhere in this section. Some comments were quite specific while others were general in nature or expressed ideas that were not substantiated with backup material. The staff has taken these comments into consideration and revised and clarified the rule and regulatory guide accordingly. Additional guidance is provided in NUMARC-8700 which has been reviewed by the staff and referenced in the regulatory guide as providing a method the staff finds acceptable for meeting the rule.

16. Technical Comments on NUREG-1032

Comments—In addition to comments on the proposed rule and draft regulatory guide, several letters contained comments on the staff's draft technical report, NUREG-1032, "Evaluation of Station Blackout Accidents at Nuclear Power Plants."

Response—NUREG-1032 was issued in draft form for public comment in May 1985 (50 FR 24332). The comments received were reviewed and considered by the staff and resulted in a re-evaluation of the technical analysis. Details of the specific comments and responses are not presented here. Rather, NUREG-1032 was revised extensively over the past year to address the public comments. In general, the overall conclusions on the risk from station blackout events did not change significantly as a result of the reanalysis. One of the major changes resulting from the reanalysis was a revision to the definitions of plant characteristics, especially the clustering of plants into site and weather-related groups (Appendix A in NUREG-1032). These changes are reflected in revisions to the guidance in the station blackout regulatory guide to determine plant-specific acceptable station blackout coping durations.

17. Relationship of USI A-44 to Other NRC Generic Issues

Comments—The major public comment regarding the relationship of USI A-44 to other NRC generic safety issues was that the proposed rule may not be necessary or should be postponed because of ongoing work to resolve related generic issues. Some comments were general in nature such as the following one from Southern California Edison Company:

Promulgation of a final station blackout rulemaking at this time will unnecessarily complicate the final resolution of related generic technical issues. The NRC must develop and implement a program to coordinate the resolution of all power-related generic issues prior to finalizing any individual proposed rule.

AIF suggested that the implementation of any requirements for station blackout be deferred until the requirements from USI A-45, Shutdown Decay Heat Removal Requirements, are known and until the effect of source term changes can be evaluated.

NUMARC mentioned specific proposed and existing regulatory requirements that should be considered because they could reduce the need for a station blackout rule (e.g., B-56, Diesel Generator Reliability, and GI 23, Reactor

Coolant Pump Seal Failures). Other related issues mentioned in the public comments were A-30, Adequacy of Safety-Related DC Power Supplies, and implementation of safe shutdown facilities to meet the fire protection requirements of Appendix R.

Response—The question that needs to be addressed is "should a requirement be imposed now to reduce risk, or should it be postponed until related issues are resolved sometime in the future?" Potentially, this could result in substantial delays, thereby not resolving generic safety issues in a timely manner. The staff has considered the resolution of USI A-44 in light of the related issues mentioned in the comments. Although these issues are identified as separate tasks within NRC they are all managed in a well established program that coordinates all related issues. A brief discussion of the most relevant issues is presented below. (Additional information is provided in NUREG-1109, "Regulatory Analysis for the Resolution of Unresolved Safety Issue A-44, Station Blackout.")

Resolution of USI A-45 will occur at some time following issuance of the station blackout rule (§ 50.83) and after plant-specific station blackout coping evaluations have been performed by licensees per NUMARC/NUGSBO Initiative 5, utilizing guidelines provided in NUMARC-8700. Further, the resolution of USI A-45 is expected to be highly plant-specific and focused on loss of decay heat removal considerations from other causes beyond station blackout. Utilization will be made of A-44 evaluations (as applicable) and any plant equipment modification needs identified from A-45 will be carefully evaluated to maximize effective use of previously identified A-44 equipment needs.

Maintaining emergency diesel generator reliability, the purpose of B-56, is an integral part of the resolution of USI A-44. However, the Commission believes that additional defense-in-depth will achieve a substantial increase in protection to public health and safety.

The resolution of GI 23 (reactor coolant pump seal leakage) deals with loss of reactor coolant system inventory and associated degraded core conditions. USI A-44 deals with station blackout induced effects, which result in loss of ac power, thereby impacting a broader spectrum of plant equipment and safety-related functions. Although the resolution of GI 23 will contribute to establishing a higher level of assurance that seal leakage will be minimized (thereby minimizing the need for power

place water inventory losses over station blackout duration and recovery phase), resolution of GI 23 by itself will not address the broader scope of USI A-44 safety concerns.

Some licensees have implemented dedicated shutdown systems that are independent of normal and emergency ac power to meet Appendix R requirements. If applicable, these features would be credited in the resolution of USI A-44 by providing the capability to cope with a station blackout.

Thus, the resolution of USI A-44 is coordinated with related generic issues, and implementation of a final resolution should not be delayed further. (Response to comments on the effect of source term changes is included in subject number 8.)

18. An Alternative of Plant-Specific Probabilistic Assessments

Comments—Several utilities suggested that, in lieu of the requirements in the rule, licensees should be permitted to submit plant-specific evaluations to demonstrate that the frequency of core damage from station blackout events is 10^{-6} per reactor-year or less. In a similar vein, the suggestion was made that NRC could specify a target level of probability for ac power systems in order to satisfy NRC's criteria for core damage frequency. A few licensees submitted limited probabilistic assessments to show that for some plants station blackout could have a very small probability of severe consequences.

Response—The Commission does not preclude licensees from submitting plant-specific probabilistic assessments to support a determination that station blackout would have a very small probability for causing core damage. However, the requirements of the rule must be met. The Commission would observe that the use of probabilistic assessments was important as input to the regulatory decisionmaking that culminated in the station blackout rule and related guidance. As expressed in the Commission's Safety Goal Policy statement of August 1986 (51 FR 28044), the Commission has acquired a reasonable degree of confidence about the usefulness and value of probabilistic assessments in assisting regulatory decisionmaking on complex safety issues. In short, such assessments are of value in complementing and focusing the more traditional and deterministic defense-in-depth approaches. On the other hand, any licensee must decide whether or not its plant-specific ac power configuration and other related equipment are sufficiently unique to

merit the conduct and submittal of a probabilistic assessment as part of achieving compliance of § 50.63. The Commission's experience also indicates that probabilistic assessments are resource intensive and can be of marginal utility if their only end result is to delay rule compliance.

19. Procedures and Operator Actions During Station Blackout

Comments—(A) Several letters from industry commented that, in response to Generic Letter 81-04, "Emergency Procedures and Training for Station Blackout Events," dated February 21, 1981, utilities already have procedures in place to prepare plant operations for station blackout events. Owners' groups have established generic guidance for station blackout operating procedures for licensees to use in developing plant-specific procedures. A representative of the Professional Reactor Operator Society commented that:

Generic procedures are used by most operating facilities. These procedures are not carried into adequate depth of specific power plant operations. The industry has relied too heavily on generic procedures and has not given a real look at what specific steps must be taken. Extrapolation of these procedures must be required. Specific maintenance procedures must be established and followed.

(B) Other comments on procedures related to the timeliness of operator actions, both inside and outside the control room. Houston Lighting and Power suggested that:

In Section 3.7 (Part 6) [of the regulatory guide], the first sentence should be revised to read, "Consideration should be given to timely operator actions both inside and outside of the control room that . . .," so that credit can be taken for existing equipment that may not have actuation and control from the control room.

Illinois Power Company recommended that:

. . . Section C.3.3, Item 3.a, of the proposed regulatory guide should be modified to read:

a. The system should be capable of being actuated and controlled from the control room, or if other means of control are required (e.g., manual jumping of control logics or manual operation of valves), it should be demonstrated that these steps can be carried out in a timely fashion.

Response—(A) Licensees may take credit for station blackout procedures already in place to comply with the station blackout rule. However, for the most part, these procedures were developed without having the benefit of a plant-specific assessment to determine whether a plant could withstand a station blackout for a specific duration. Therefore, these procedures may need to

be modified after licensees have determined an acceptable station blackout coping duration and evaluated their plant's response to a station blackout of this duration.

(B) The staff agrees with the comments related to operator actions outside the control room, and the regulatory guide was revised accordingly.

20. Schedule Provisions in Proposed § 50.63

Comments—Two letters contained comments on the proposed schedule in § 50.63. OCRE felt the scheduling provisions in the proposed rule were far too generous. One individual recommended that the schedule be modified to require licensees to submit, within 9 months of the date of the amendment, a list of modifications along with a proposed schedule to implement those modifications. (According to the proposed rule, licensees would not have to submit a schedule for implementing equipment modifications until after the staff received and reviewed licensees' submittals on their plant's acceptable station blackout duration.)

Response—The staff agreed in part with these comments, and the schedule was revised accordingly. Section 50.63(c)(1)(iii) now requires that licensees submit within 9 months after the rule is issued a list of equipment modifications and a proposed schedule for implementing them. A final schedule would be developed after NRC has reviewed the licensees' submittal of their plant's acceptable station blackout duration.

21. Industry Initiatives

Comments—In addition to comments on the proposed rule, NUMARC endorsed the following five initiatives* to address the more important contributions to station blackout:

1. Each utility will review their site(s) against the criteria specified in NUREG-1109, and if the site(s) fall into the category of an eight-hour site after utilizing all power sources available, the utility will take actions to reduce the site(s) contribution to the overall risk of station blackout. Non-hardware changes will be made within one year. Hardware changes will be made within a reasonable time thereafter.

* NUMARC initially proposed a set of four initiatives. The fifth initiative regarding the performance of a coping assessment was provided in NUMARC-8700, which was submitted by letter from J. Opeka (NUMARC) to T. Speis (RES) dated November 23, 1987. A copy is available for public inspection and copying for a fee at the NRC Public Document Room at 1717 H Street NW., Washington, DC.

2. Each utility will implement procedures at each of its site(s) for:

- a. Coping with a station blackout event,
- b. Restoration of ac power following a station blackout event, and
- c. Preparing the plant for severe weather conditions (e.g., hurricanes and tornadoes) to reduce the likelihood and consequences of a loss of offsite power and to reduce the overall risk of a station blackout event.

3. Each utility will, if applicable, reduce or eliminate cold fast-starts of emergency diesel generators for testing through changes to technical specifications or other appropriate means.

4. Each utility will monitor emergency ac power unavailability utilizing data utilities provide to INPO on a regular basis.

5. Each utility will assess the ability of its plant(s) to cope with a station blackout. Plants utilizing alternate ac power for station blackout response which can be shown by test to be available to power the shutdown buses within 10 minutes of the onset of station blackout do not need to perform any coping assessment. Remaining alternate ac plants will assess their ability to cope for 1 hour. Plants not utilizing an alternate ac source will assess their ability to cope for 4 hours. Factors identified which prevent demonstrating the capability to cope for the appropriate duration will be addressed through hardware and/or procedural changes so that successful demonstration is possible.

NUMARC previously opposed generic rulemaking and felt that the first four initiatives would resolve the station blackout issue.

Response—These five initiatives now include many of the elements that are included in the NRC resolution of USI A-44. The staff has followed up on the NUMARC initiatives through a series of meetings in 1986 through 1987. The result has been the development of NUMARC-8700 which provides guidelines and criteria acceptable to the staff. The procedures in NUMARC-8700 have been referenced in Regulatory Guide 1.155 as providing guidance acceptable to the staff for meeting the requirements of the rule. Table 1 in Regulatory Guide 1.155 provides a cross-reference to NUMARC-8700 and notes where the regulatory guide takes precedence. NUMARC's previous concerns have been addressed in the development of Regulatory Guide 1.155 and NUMARC-8700.

Finding of No Significant Environmental Impact: Availability

The Commission has determined under the National Environmental Policy Act of 1969, as amended, and the Commission's rules in Subpart A of 10 CFR Part 51, that this rule is not a major Federal action significantly affecting the quality of the human environment, and therefore, an environmental impact statement is not required. There are not any adverse environmental impacts as a result of the rule because there is no

additional radiological exposure to the general public or plant employees, and plant shutdown is not required so there are no additional environmental impacts as a result of the need for replacement power. The environmental assessment and finding of no significant impact on which this determination is based are available for inspection and copying for a fee at the NRC Public Document Room, 1717 H Street NW., Washington, DC. Single copies of the environmental assessment and the finding of no significant impact are available from Mr. Warren Minners, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Telephone: (301) 492-7827.

Paperwork Reduction Act Statement

This final rule amends information collection requirements that are subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et seq.*). These requirements were approved by the Office of Management and Budget approval number 3150-0011.

Regulatory Analysis

The Commission has prepared a regulatory analysis on this final regulation. The analysis examines the costs and benefits of the alternatives considered by the Commission. A copy of the regulatory analysis, NUREC-1109, "Regulatory/Backfit Analysis for the Resolution of Unresolved Safety Issue A-44, Station Blackout," is available for inspection and copying for a fee at the NRC Public Document Room, 1717 H Street NW., Washington, DC 20555.

Regulatory Flexibility Certification

As required by the Regulatory Flexibility Act (5 U.S.C. 605(b)), the Commission certifies that this rule does not have a significant economic impact on a substantial number of small entities. The rule requires that nuclear power plants be able to withstand a total loss of ac power for a specified time duration and maintain reactor core cooling during that period. These facilities are licensed under the provisions of §§ 50.21(b) and 50.22 of 10 CFR Part 50. The companies that own these facilities do not fall within the scope of "small entities" as set forth in the Regulatory Flexibility Act or the small business size standards set forth in regulations issued by the Small Business Administration in 13 CFR Part 121.

List of Subjects in 10 CFR Part 50

Antitrust, Classified information, Fire prevention, Incorporation by reference, Intergovernmental relations, Nuclear power plants and reactors, Penalty,

Radiation protection, Reactor siting criteria, Reporting and recordkeeping requirements.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and 5 U.S.C. 553, the NRC is adopting the following amendments to 10 CFR Part 50.

PART 50—DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

1. The authority citation for Part 50 is revised to read as follows:

Authority: Secs. 302, 303, 304, 105, 181, 182, 183, 188, 189, of Stat. 936, 937, 938, 948, 953, 954, 955, 958, as amended, sec. 234, 63 Stat. 1244, as amended (42 U.S.C. 2132, 2133, 2134, 2135, 2201, 2232, 2233, 2238, 2239, 2282); sec. 201, as amended 202, 208, 68 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5848).

Section 50.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5851). Section 50.10 also issued under sec. 101, 185, 68 Stat. 938, 955, as amended (42 U.S.C. 2131, 2235); sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332). Sections 50.23, 50.35, 50.55, and 50.56 also issued under sec. 185, 68 Stat. 955 (42 U.S.C. 2235). Sections 50.33a, 50.55a and Appendix Q also issued under sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332). Sections 50.34 and 50.54 also issued under sec. 204, 68 Stat. 1245 (42 U.S.C. 5844). Sections 50.58, 50.61, and 50.62 also issued under Pub. L. 97-415, 96 Stat. 2073 (42 U.S.C. 2238). Section 50.78 also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Sections 50.60-50.81 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Section 50.103 also issued under sec. 108, 68 Stat. 839, as amended (42 U.S.C. 2138). Appendix F also issued under sec. 187, 68 Stat. 955 (42 U.S.C. 2237).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273); §§ 50.10 (a), (b), and (c), 50.44, 50.46, 50.48, 50.54, and 50.80 (e) are issued under sec. 181b, 68 Stat. 948, as amended (42 U.S.C. 2201(b)); §§ 50.10 (b) and (c), and 50.54 are issued under sec. 161i, 68 Stat. 949, as amended (42 U.S.C. 2201(i)); and §§ 50.9, 50.55(e), 50.58(b), 50.70, 50.71, 50.72, 50.73, and 50.78 are issued under sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

2. In § 50.2, definitions of "alternate ac source", "safe shutdown" and "station blackout" are added in the alphabetical sequence to read as follows:

§ 50.2 Definitions.

"Alternate ac source" means an alternating current (ac) power source that is available to and located at or nearby a nuclear power plant and meets the following requirements:

- (1) Is connectable to but not normally connected to the offsite or onsite emergency ac power systems;

(2) Has minimum potential for common mode failure with offsite power and the onsite emergency ac power sources;

(3) Is available in a timely manner after the onset of station blackout; and

(4) Has sufficient capacity and reliability for operation of all systems required for coping with station blackout and for the time required to bring and maintain the plant in safe shutdown (non-design basis accident).

"Safe shutdown (non-design basis accident (non-DBA))" for station blackout means bringing the plant to those shutdown conditions specified in plant technical specifications as Hot Standby or Hot Shutdown, as appropriate (plants have the option of maintaining the RCS at normal operating temperatures or at reduced temperatures).

"Station blackout" means the complete loss of alternating current (ac) electric power to the essential and nonessential switchgear buses in a nuclear power plant (i.e., loss of offsite electric power system concurrent with turbine trip and unavailability of the onsite emergency ac power system). Station blackout does not include the loss of available ac power to buses fed by station batteries through inverters or by alternate ac sources as defined in this section, nor does it assume a concurrent single failure or design basis accident. At single unit sites, any emergency ac power source(s) in excess of the number required to meet minimum redundancy requirements (i.e., single failure) for safe shutdown (non-DBA) is assumed to be available and may be designated as an alternate power source(s) provided the applicable requirements are met. At multi-unit sites, where the combination of emergency ac power sources exceeds the minimum redundancy requirements for safe shutdown (non-DBA) of all units, the remaining emergency ac power sources may be used as alternate ac power sources provided they meet the applicable requirements. If these criteria are not met, station blackout must be assumed on all the units.

§ 50.8 [Amended]

3. In § 50.8, paragraph (b), insert the section number 50.63 in numerical order in the list of section numbers.

4. A new § 50.63 is added to read as follows:

§ 50.63 Loss of all alternating current power.

(a) *Requirements.* (1) Each light-water-cooled nuclear power plant licensed to operate must be able to withstand for a specified duration and

recover from a station blackout as defined in § 50.2. The specified station blackout duration shall be based on the following factors:

(i) The redundancy of the onsite emergency ac power sources;

(ii) The reliability of the onsite emergency ac power sources;

(iii) The expected frequency of loss of offsite power; and

(iv) The probable time needed to restore offsite power.

(2) The reactor core and associated coolant, control, and protection systems, including station batteries and any other necessary support systems, must provide sufficient capacity and capability to ensure that the core is cooled and appropriate containment integrity is maintained in the event of a station blackout for the specified duration. The capability for coping with a station blackout of specified duration shall be determined by an appropriate coping analysis. Utilities are expected to have the baseline assumptions, analyses, and related information used in their coping evaluations available for NRC review.

(b) *Limitation of scope.* Paragraph (b) of this section does not apply to those plants licensed to operate prior to July 21, 1988, if the capability to withstand station blackout was specifically addressed in the operating licenses proceeding and was explicitly approved by the NRC.

(c) *Implementation.* (1) *Information Submittal.* For each light-water-cooled nuclear power plant licensed to operate on or before July 21, 1988, the licensee shall submit the information defined below to the Director of the Office of Nuclear Reactor Regulation by April 17, 1989. For each light-water-cooled nuclear power plant licensed to operate after the effective date of this amendment, the licensee shall submit the information defined below to the Director by 270 days after the date of license issuance.

(i) A proposed station blackout duration to be used in determining compliance with paragraph (a) of this section, including a justification for the selection based on the four factors identified in paragraph (a) of this section;

(ii) A description of the procedures that will be implemented for station blackout events for the duration determined in paragraph (c)(1)(i) of this section and for recovery therefrom; and

(iii) A list of modifications to equipment and associated procedures, if any, necessary to meet the requirements of paragraph (a) of this section, for the specified station blackout duration determined in paragraph (c)(1)(i) of this

section, and a proposed schedule for implementing the stated modifications.

(2) *Alternate ac source:* The alternate ac power source(s), as defined in § 50.2, will constitute acceptable capability to withstand station blackout provided an analysis is performed which demonstrates that the plant has this capability from onset of the station blackout until the alternate ac source(s) and required shutdown equipment are started and lined up to operate. The time required for startup and alignment of the alternate ac power source(s) and this equipment shall be demonstrated by test. Alternate ac source(s) serving a multiple unit site where onsite emergency ac sources are not shared between units must have, as a minimum, the capacity and capability for coping with a station blackout in any of the units. At sites where onsite emergency ac sources are shared between units, the alternate ac source(s) must have the capacity and capability as required to ensure that all units can be brought to and maintained in safe shutdown (non-DBA) as defined in § 50.2. If the alternate ac source(s) meets the above requirements and can be demonstrated by test to be available to power the shutdown buses within 10 minutes of the onset of station blackout, then no coping analysis is required.

(3) *Regulatory Assessment:* After consideration of the information submitted in accordance with paragraph (c)(1) of this section, the Director, Office of Nuclear Reactor Regulation, will notify the licensee of the Director's conclusions regarding the adequacy of the proposed specified station blackout duration, the proposed equipment modifications and procedures, and the proposed schedule for implementing the procedures and modifications for compliance with paragraph (a) of this section.

(4) *Implementation Schedule:* For each light-water-cooled nuclear power plant licensed to operate on or before June 21, 1988, the licensee shall, within 30 days of the notification provided in accordance with paragraph (c)(3) of this section, submit to the Director of the Office of Nuclear Reactor Regulation a schedule commitment for implementing any equipment and associated procedure modifications necessary to meet the requirements of paragraph (a) of this section. This submittal must include an explanation of the schedule and a justification if the schedule does not provide for completion of the modifications within two years of the notification provided in accordance with paragraph (c)(3) of this section. A final schedule for implementing modifications

necessary to comply with the requirements of paragraph (e) of this section will be established by the NRC staff in consultation and coordination with the affected licensee.

Dated at Rockville, Maryland, this 13th day of June 1988.

For the Nuclear Regulatory Commission,
Samuel J. Chilk,
Secretary of the Commission.

Backfit Analysis

Analysis and Determination That the Rulemaking To Amend 10 CFR Part 50 Concerning Station Blackout Complies With the Backfit Rule 10 CFR 50.109

The Commission's existing regulations establish requirements for the design and testing of onsite and offsite electrical power systems (10 CFR Part 50, Appendix A, General Design Criteria 17 and 18). However, as operating experience has accumulated, the concern has arisen regarding the reliability of both the offsite and onsite emergency ac power systems. These systems provide power for various safety systems, including reactor core decay heat removal and containment heat removal, which are essential for preserving the integrity of the reactor core and the containment building, respectively. In numerous instances emergency diesel generators have failed to start and run during tests conducted at operating plants. In addition, a number of operating plants have experienced a total loss of offsite electric power, and more such occurrences are expected. Existing regulations do not require explicitly that nuclear power plants be designed to withstand the loss of all ac power for any specified period.

This issue has been studied by the staff as part of Unresolved Safety Issue (USI) A-44, "Station Blackout." Both deterministic and probabilistic analyses were performed to determine the timing and consequences of various accident sequences and to identify the dominant factors affecting the likelihood of core melt accidents from station blackout. Although operational experience shows that the risk to public health and safety is not undue, these studies, which have evaluated plant design features and site-dependent features in detail, show that blackout can be a significant contributor to the overall residual risk. Consequently, the Commission is amending its regulations to require that plants be capable of withstanding a total loss of ac power for a specified duration and to maintain reactor core cooling during that period.

An analysis of the benefits and costs of implementing the station blackout

rule is presented in NUREG-1109, "Regulatory/Backfit Analysis for the Resolution of Unresolved Safety Issue A-44, Station Blackout. The estimated benefit from implementing the station blackout rule is a reduction in the frequency of core damage per reactor-year due to station blackout and the associated risk of offsite radioactive releases. The risk reduction for 100 operating reactors is estimated to be 145,000 person-rem and supports the Commission's conclusion that § 50.63 provides a substantial improvement in the level of public health and safety protection.

The cost for licensees to comply with the rule would vary depending on the existing capability of each plant to cope with a station blackout, as well as the specified station blackout duration for that plant. The costs would be primarily for licensees (1) to assess the plant's capability to cope with a station blackout, (2) to develop procedures, (3) to improve diesel generator reliability if the reliability falls below certain levels, and (4) to retrofit plants with additional components or systems, as necessary, to meet the requirements.

The estimated total cost for 100 operating reactors to comply with the resolution of USI A-44 is about \$60 million. The average cost per reactor would be around \$600,000, ranging from \$350,000, if only a station blackout assessment and procedures and training are necessary, to a maximum of about \$4 million if substantial modifications are needed, including requalification of a diesel generator.

The overall value-impact ratio, not including accident avoidance costs, is about 2,400 person-rem averted per million dollars. If the net cost, which includes the cost savings from accident avoidance (i.e., cleanup and repair of onsite damages and replacement power following an accident), were used, the overall value-impact ratio would improve significantly to about 8,100 person-rem averted per million dollars. These values, which exceed the \$1,000/person-rem interim guidance provided by the Commission, support proceeding with the implementation of § 50.63.

The preceding quantitative value-impact analysis was one of the factors considered in evaluating the rule, but other factors also played a part in the decision-making process. Probabilistic risk assessment (PRA) studies performed for this USI, as well as some plant-specific PRAs, have shown that station blackout can be a significant contributor to core melt frequency, and, with consideration of containment failure, station blackout events can represent an important contributor to

reactor risk. In general, active systems required for containment heat removal are unavailable during station blackout. Therefore, the offsite risk is higher from a core melt resulting from a station blackout than it is from many other accident scenarios.

Although there are licensing requirements and guidance directed at providing reliable offsite and onsite ac power, experience has shown that there are practical limitations in ensuring the reliability of offsite and onsite emergency ac power systems. Potential vulnerabilities to common cause failures associated with design, operational, and environmental factors can affect ac power system reliability. For example, if potential common cause failures of emergency diesel generators exist (e.g., in service, water or oil power support systems), then the estimated core damage frequency from station blackout events can increase significantly. Also, even though recent data indicate that the average emergency diesel generator reliability has improved slightly since 1976, these data also show that diesel generator failure rates during unplanned demand (e.g., following a loss of offsite power) were higher than that during surveillance tests.

The estimated frequency of core damage from station blackout events is directly proportional to the frequency of the initiating event. Estimates of station blackout frequencies for this USI were based on actual operational experience with credit given for trends showing a reduction in the frequency of losses of offsite power resulting from plant-centered events. This is assumed to be a realistic indicator of future performance. An argument can be made that the future performance will be better than the past. For example, when problems with the offsite power grid arise, they are fixed and, therefore, grid reliability should improve. On the other hand, grid power failures may become more frequent because fewer plants are being built, and more power is being transmitted among regions, thus placing greater stress on transmission lines.

The factors discussed above support the determination that additional defense-in-depth provided by the ability of plant to cope with station blackout for a specific duration would provide substantial increase in the overall protection of the public health and safety, and the direct and indirect costs of implementation are justified in view of this increased protection. The Commission has considered how this backfit should be prioritized and scheduled in light of other regulatory activities ongoing at operating nuclear

er plants. Station blackout warrants a high priority ranking based on both status as an "unresolved safety issue" and the results and conclusions reached in resolving this issue. As noted in the implementation section of the rule (§ 50.63(c)(4)), the schedule for equipment modification (if needed to meet the requirements of the rule) shall be established by the NRC staff in consultation and coordination with the licensee. Modifications that cannot be scheduled for completion within two years after NRC accepts the licensee's specified station blackout duration must be justified by the licensee. The NRC retains the authority to determine the schedules for modifications.

In addition, some foreign countries, including France, Britain, Sweden, Germany and Belgium, have taken steps to reduce the risk from station blackout events. These steps include adding design features to enhance the capability of the plant to cope with a station blackout for a substantial period of time and/or adding redundant and diverse emergency ac power sources.

Analysis of § 50.109(c) Factors

1. Statement of the specific objectives of the backfit is designed to achieve.

The NRC staff has completed a review and evaluation of information developed since 1980 on Unresolved Safety Issue (USI) A-44, Station Blackout. As a result of these efforts, the NRC is amending 10 CFR Part 50 by adding a new § 50.63, "Station Blackout."

The objective of the station blackout rule is to reduce the risk of severe accidents associated with station blackout. Specifically, the rule requires all light-water-cooled nuclear power plants to be able to cope with a station blackout for a specified duration and to have procedures and training for such an event. A regulatory guide, to be issued along with the rule, provides an acceptable method to determine the station blackout duration for each plant. The duration is to be determined for each plant based on a comparison of the individual plant design with factors that have been identified as the main contributors to risk of core melt resulting from station blackout. These factors are (1) the redundancy of onsite emergency ac power sources, (2) the reliability of onsite emergency ac power sources, (3) the frequency of loss of offsite power, and (4) the probable time needed to restore offsite power.

2. General description of the activity

required by the licensee or applicant in order to complete the backfit.

In order to comply with the resolution of USI A-44, licensees will be required to—

- Maintain the reliability of onsite emergency ac power sources at or above specified acceptable reliability levels.
- Develop procedures and training to restore ac power using nearby power sources if the emergency ac power system and the normal offsite power sources are unavailable.

- Determine the duration that the plant should be able to withstand a station blackout based on the factors specified in § 50.63, "Station Blackout," and Regulatory Guide 1.155, "Station Blackout."

- If available, an alternate ac power source that meets specific criteria for independence and capacity can be used to cope with a station blackout.

- Evaluate the plant's actual capability to withstand and recover from a station blackout. This evaluation includes:

- Verifying the adequacy of station battery power, condensate storage tank capacity, and plant/instrument air for the station blackout duration.
- Verifying the operability of equipment needed to operate during a station blackout and the recovery from the blackout for environmental conditions associated with total loss of ac power (i.e., loss of heating, ventilation, and air conditioning).

- Depending on the plant's existing capability to cope with a station blackout, licensees may or may not need to backfit hardware modifications (e.g., adding battery capacity) to comply with the rule. (See item 8 of this analysis for additional discussion.) Licensees will be required to have procedures and training to cope with and recover from a station blackout.

3. Potential change in the risk to the public from the accidental offsite release of radioactive material.

Implementation of the station blackout rule will result in an estimated total risk reduction to the public ranging from 85,000 to 215,000 person-rem with a best estimate of about 145,000 person-rem.

4. Potential impact on radiological exposure of facility employees.

For 100 operating reactors, the estimated total reduction in occupational exposure resulting from reduced core damage frequencies and associated postaccident cleanup and repair activities is 1,500 person-rem. No

significant increase in occupational exposure is expected from operation and maintenance activities associated with the rule. Equipment additions and modifications contemplated do not require work in and around the reactor coolant system and therefore are not expected to result in significant radiation exposure.

5. Installation and continuing costs associated with the backfit, including the cost of facility downtime or the cost of construction delay.

For 100 operating reactors, the total estimated cost associated with the station blackout rule ranges from \$42 to \$94 million with a best estimate of \$60 million. This estimate breaks down as follows:

Activity	Estimated number of reactors	Estimated total cost (million dollars)		
		Best	High	Low
Assess plant's capability to cope with station blackout	100	25	40	20
Develop procedures and training	100	10	15	5
Improve diesel generator reliability	10	2.5	4	1.5
Requalify diesel generator	2	5.5	11	2.5
Install hardware to increase plant capability to cope with station blackout	27	17	24	13
Totals		60	94	42

6. The potential safety impact of changes in plant or operational complexity, including the relationship to proposed and existing regulatory requirements.

The rule requiring plants to be able to cope with a station blackout should not add to plant or operational complexity. The station blackout rule is closely related to several NRC generic programs and proposed and existing regulatory requirements as the following discussion indicates.

Generic Issue B-56, Diesel Generator Reliability

The resolution of USI A-44 includes a regulatory guide on station blackout that specifies the following guidance on diesel generator reliability [Regulatory Guide 1.155, Sections C1.1. and C.1.2]:

The minimum emergency diesel generator (EDG) reliability should be targeted at 0.95 per demand for each EDG for plants in emergency ac Groups A, B, and C and at

0.975 per demand for each EDG for plants in emergency ac Group D (see Table 2). These reliability levels will be considered minimum target reliabilities and each plant should have an EDG reliability program containing the principal elements, or their equivalent, outlined in Regulatory Position 1.2. Plants that select a target EDG reliability of 0.975 will use the higher level as the target in their EDG reliability programs.

The reliable operation of onsite emergency ac power sources should be ensured by a reliability program designed to maintain and monitor the reliability level of each power source over time for assurance that the selected reliability levels are being achieved. An EDG reliability program would typically be composed of the following elements or activities (or their equivalent):

1. Individual EDG reliability target levels consistent with the plant category and coping duration selected from Table 2.
2. Surveillance testing and reliability monitoring programs designed to track EDG performance and to support maintenance activities.
3. A maintenance program that ensures that the target EDG reliability is being achieved and that provides a capability for failure analysis and root-cause investigations.
4. An information and data collection system that services the elements of the reliability program and that monitors achieved EDG reliability levels against target values.
5. Identified responsibilities for the major program elements and a management oversight program for reviewing reliability levels being achieved and ensuring that the program is functioning properly.

The resolution of B-58 will provide specific guidance for use by the staff or industry to review the adequacy of diesel generator reliability programs consistent with the resolution of USI A-44.

Generic Issue 23, Reactor Coolant Pump Seal Failures

Reactor coolant pump (RCP) seal integrity is necessary for maintaining primary system inventory during station blackout conditions. The estimates of core damage frequency for station blackout events for USI A-44 assumed that RCP seals would leak at a rate of 20 gallons per minute. Results of analyses performed for B-23 will provide the information necessary to estimate RCP seal behavior during a station blackout. The industry coping analysis guidelines (NUMARC-8700) recognize the possibility of leakages exceeding an assumed 25 gpm per pump and incorporate the need to reevaluate the plant-specific coping analysis if the resolution of GI 23 identifies higher levels.

USI A-45, Shutdown Decay Heat Removal Requirements

The overall objective of USI A-45 is to evaluate the adequacy of current licensing design requirements to ensure that the nuclear power plants do not pose an unacceptable risk as a result of failure to remove shutdown decay heat. The study includes an assessment of alternative means of shutdown decay heat removal and of diverse "dedicated" systems for this purpose. Results will include proposed recommendations regarding the desirability of, and possible design requirements for, improvements in existing systems or an alternative dedicated decay heat removal method.

The USI A-44 concern for maintaining adequate core cooling under station blackout conditions can be considered a subset of the overall A-45 issue. However, there are significant differences in scope between these two issues. USI A-44 deals with the probability of loss of ac power, the capability to remove decay heat using systems that do not require ac power, and the ability to restore ac power in a timely manner. USI A-45 deals with the overall reliability of the decay heat removal function in terms of response to transients, small-break loss-of-coolant accidents, and special emergencies such as fires, floods, seismic events, and sabotage.

Although the recommendations that might result from the resolution of USI A-45 are not yet final, some could affect the station blackout capability, while others would not. Recommendations that involve a new or improved decay heat removal system that is ac power dependent but that does not include its own dedicated ac power supply would have no effect on USI A-44.

Recommendations that involve an additional ac-independent decay heat removal system would have a very modest effect on USI A-44. Recommendations that involve an additional decay heat removal system with its own ac power supply would have a significant effect on USI A-44. Such a new additional system would receive the appropriate credit within the USI A-44 resolution by either changing the emergency ac power configuration group or providing the ability to cope with a station blackout for an extended period of time. Well before plant modifications, if any, will be implemented to comply with the station blackout rule, it is anticipated that the proposed technical resolution of USI A-45 will be published for public comment. Those plants needing hardware modifications for station blackout could

be reevaluated before any actual modifications are made so that any contemplated design changes resulting from the resolution of USI A-45 can be considered at the same time.

Generic Issue A-30, Adequacy of Safety-Related DC Power Supply

The analysis performed for USI A-44 assumed that a high level of dc power system reliability would be maintained so that (1) dc power system failures would not be a significant contributor to losses of all ac power and (2) should a station blackout occur, the probability of immediate dc power system failure would be low. Whereas Generic Issue A-30 focuses on enhancing battery reliability, the resolution of USI A-44 is aimed at ensuring adequate station battery capacity in the event of a station blackout of a specified duration. Therefore, these two issues are consistent and compatible.

Fire Protection Program

Section 50.48 of 10 CFR Part 50 states that each operating nuclear power plant must have a fire protection plan that satisfies GDC 3. The fire protection features required to satisfy GDC 3 are specified in Appendix R to 10 CFR Part 50. They include certain provisions regarding alternative and dedicated shutdown capability. To meet these provisions, some licensees have added, or plan to add, improved capability to restore power from offsite sources or onsite diesels for the shutdown system. A few plants have installed a safe shutdown facility for fire protection that includes a charging pump powered by its own independent ac power source. In the event of a station blackout, this system can provide makeup capability to the primary coolant system as well as reactor coolant pump seal cooling. This could be a significant benefit in terms of enhancing the ability of a plant to cope with a station blackout. Plants that have added equipment to achieve alternate safe shutdown in order to meet Appendix R requirements could take credit for that equipment, if available, for coping with a station blackout event.

7. The estimated resource burden on the NRC associated with the backfit and the availability of such resources.

The estimated total cost for NRC review of industry submittals required by the station blackout rule is \$1.5 million based on submittals for 100 reactors and an estimated average of 175 person-hours per reactor.

The potential impact of differences in lity type, design, or age on the vancy and practicality of the backfit.

The station blackout rule applies to all pressurized water reactors and boiling water reactors. However, in determining an acceptable station blackout coping capability for each plant, differences in plant characteristics relating to ac power reliability (e.g., number of emergency diesel generators, the reliability of the offsite and onsite emergency ac power systems) could result in different acceptable coping capabilities. For example, plants with an already low risk from station blackout because of multiple, highly reliable ac power sources are required to withstand a station blackout for a relatively short period of time; and few, if any, hardware backfits would be required as a result of the rule. Plants with currently higher risk from station blackout are required to withstand somewhat longer duration blackouts; and, depending on their existing capability, may need some modifications to achieve the longer station blackout capability.

9. Whether the backfit is interim or final and, if interim, the justification for imposing the backfit on an interim basis.

The station blackout rule is the final solution of USI A-44; it is not an interim measure.

Doc. 88-13651 Filed 6-20-88; 8:45 am]

BILLING CODE 7580-01-M

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 80-CE-04-AD; Amdt. 39-5961]

Airworthiness Directives; Cessna Models T210M, T210N and P210N Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.
ACTION: Final rule, rescission.

SUMMARY: This amendment rescinds Airworthiness Directive (AD) 80-04-09, Amendment 39-3697, applicable to Cessna Models T210M, T210N and P210N airplanes. Subsequent to the issuance of AD 80-04-09 the FAA completed a detailed review and analysis of the service history of these airplanes and has determined that the actions required by that AD do not provide an increase in protection against fuel vapor problems. This action will delete the necessity of installing an insulated fuel hose on these airplanes,

and eliminate an unnecessary burden on the public.

EFFECTIVE DATE: June 30, 1988.

ADDRESSES: Information pertaining to this action may be examined at the Rules Docket, Office of the Regional Counsel, Room 1558, 601 East 12th Street, Kansas City, Missouri 64108.

FOR FURTHER INFORMATION CONTACT: Mr. Paul O. Pendleton, Aerospace Engineer, Wichita Aircraft Certification Office, ACE-140W, FAA, 1801 Airport Road, Room 100, Mid-Continent Airport, Wichita, Kansas 67209; telephone (316) 946-4427.

SUPPLEMENTARY INFORMATION: Airworthiness Directive AD 80-04-09 (Amendment 39-3697) (45 FR 6950; February 11, 1980), effective February 16, 1980, requires installation of an insulated fuel hose in accordance with Cessna Single Engine Customer Care Service Information Letter SE79-60 on certain Cessna Models T210M, T210N and P210N airplanes.

The FAA has now determined that installation of the insulated fuel hose in accordance with AD 80-04-09 does not provide an increase in protection against fuel vapor problems associated with these airplanes. AD 79-15-01, which required a placard dealing with fuel flow fluctuations, has been determined to be most effective in addressing the fuel vapor problem which has not been reported with any regularity over the past several years. Therefore, the FAA is rescinding AD 80-04-09.

This action permits those airplanes previously modified in accordance with AD 80-04-09 to either operate with the insulated fuel hose or return to the original configuration. This action also permits those airplanes affected by AD 80-04-09 but not currently in compliance with this AD to remain in the original configuration.

This rescission will not result in any increase in cost to the private sector and will remove an unnecessary burden on the public. Therefore, it is found that notice and public procedure hereon are impractical and contrary to the public interest, and good cause exists for making this amendment effective in less than 30 days.

The regulations set forth in this amendment are promulgated pursuant to authority in the Federal Aviation Act of 1950, as amended (49 U.S.C. 1301, *et seq.*), which statute is construed to preempt State law regulating the same subject. Thus, in accordance with Executive Order 12612, it is determined that such regulation does not have federalism implications warranting the

preparation of a Federalism Assessment.

The FAA has determined that this regulation is not major under section 8 of Executive Order 12291. It is impracticable for the agency to follow the procedures of Order 12291 with respect to this rule since the rule must be issued immediately to relieve an unnecessary burden on the public. If this action is subsequently determined to involve a significant regulation, a final regulatory evaluation or analysis, as appropriate, will be prepared and placed in the regulatory docket (otherwise, an evaluation is not required). A copy of it, when filed, may be obtained by contacting the Rules Docket under the caption "ADDRESSES" at the location identified.

List of Subjects in 14 CFR Part 39

Air transportation; Aircraft, Aviation safety, Safety.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends § 39.13 of Part 39 of the FAR as follows:

PART 39—[AMENDED]

1. The authority citation for Part 39 continues to read as follows:

Authority: 49 U.S.C. 1354(a), 1421 and 1423; 49 U.S.C. 106(g) (Revised, Pub. L. 97-449, January 12, 1983); and 14 CFR 11.89.

2. By rescinding AD 80-04-09; Amendment 39-3697.

This amendment becomes effective on June 30, 1988.

Issued in Kansas City, Missouri, on June 15, 1988.

Paul K. Bohr,

Director, Central Region.

[FR Doc. 88-13651 Filed 6-20-88; 8:45 am]

BILLING CODE 4910-13-M

14 CFR Part 71

[Airspace Docket No. 88-ASO-3]

Amendment to Control Zone; Jacksonville, NC

AGENCY: Federal Aviation Administration (FAA), DOT.
ACTION: Final rule.

SUMMARY: This amendment changes the published hours during which the control zone is effective. This action extends the effective hours to include periods of increased instrument flight activity at the MCAS New River (McCutcheon) Airport.

row less each way than the arrangement of the top layer; the arrangement of the middle layer may be the same as the top layer, or may be one row less one way than the arrangement of the top layer. In the 3½—4x5 and 3½—4x4 packs the face of each half of the crate shall be packed as a unit, with no shim between the two baskets.

(2) The diameter of the smallest and largest plums in any individual pack or container shall not vary more than one-fourth (¼) inch, except that plums which are placed in volume-fill or tight-fill type containers and have a diameter of two and one-fourth (2¼) inches or larger shall not vary more than three-eighths (¾) inch. A total of not more than five (5) percent, by count, of the plums in any package or container may fail to meet this requirement.

(d) When used herein "diameter" shall have the same meaning as set forth in the U.S. Standards for Grades of Fresh Plums and Prunes (7 CFR 51.1520 to 51.1538) and all other terms shall have the same meaning as when used in the amended marketing agreement and order. "No. 12B standard fruit box" measures 2¾ to 7½x11½x16½ inches, "No. 22D standard lug box" measures 2¾ to 7½x13½x16½ inches, "No. 22G standard lug box" measures 7¾ to 7½x13½x15½ inches. All dimensions are given in depth (inside dimensions) by width by length (outside dimensions).

3. Section 917.460 would be revised to read as follows:

Subpart—Grade and Size Regulation

§ 917.460 Plum Regulation 19.

(a) No handler shall ship any lot of packages or containers of any plums unless such plums grade at least U.S. No. 1, except that maturity shall be determined by the application of color standards by variety or such other tests as determined to be proper by the Federal-State Inspection Service. Internal discoloration not considered serious damage and healed growth cracks emanating from the stem end which do not cause serious damage shall be permitted. In addition to the above, any lot of Trajedy or Kelsey plums shall be permitted and additional 10 percent tolerance for defects not considered serious damage.

(b) No handler shall ship any package or other container of any variety of plums listed in Column A of the following Table I unless such plums are of a size that an eight-pound sample, representative of the sizes of the plums in the package or container, contains not more than the number of plums listed for the variety in Column B of said table,

and that a two pound subsample of the smallest plums in each eight pound sample contains not more than the number of plums listed for the variety in Column C of said table.

TABLE I

Col. A. variety	Col. B. plums per sample	Column C. plums per subsample
Amazon	64	17
Ambrs	67	18
Andys Pride	69	18
Angelino	67	18
Angee	67	18
Autumn Rose	72	19
Bee Gee	95	17
Blackamber	56	15
Black Bear	69	19
Black Diamond	69	18
Black Jewel	64	14
Black Knight	58	16
Carolyn Harris	61	17
Casselman	63	17
Catalina	59	16
Durado	74	20
Early Hawaiian Ann	60	16
Ebony	58	18
El Dorado	68	18
Esperanza	57	15
Freedom	58	15
Frier	58	15
Frontier	61	15
Gar-Rose	71	19
Grand Rose	64	16
July Red	64	16
July Santa Rosa	69	18
Kelsey	50	13
King David	50	13
King Richard	50	14
King's Black	50	16
Laroda	58	16
Late Santa Rosa (including improved)	64	17
Late Santa Rosa and Swart Rose	63	17
Linda Rose	61	17
Mariposa	61	17
Midsummer	63	17
Nubiana	58	15
President	57	15
Prime Black	69	13
Queen Ann	60	14
Queen Rose	53	14
Red Beaut	74	20
Red Globe	60	16
Red Rose	64	17
Rejedy	58	16
Red Rose	74	20
Rose Ann	69	18
Rosemary	50	14
Rose Ann	60	16
Royal Red	74	20
Rossum	74	20
Santa Rosa	60	19
Smika, Annona, New Yorker	50	14
Spring Beaut	74	20
Standard	63	21
Wickson	51	14

(c) No handler shall ship any package or container of any variety of plums not specifically named in paragraph (b) of this section, unless such plums are of a size that an eight pound sample representative of the sizes of the plums in the package or container contains not more than 139 plums, and that a two pound subsample of the smallest plums in each eight-pound sample contains not more than 38 plums.

(d) As used herein, "U.S. No. 1" and "serious damage" mean the same as defined in the United States Standards for Grades of Fresh Plums and Prunes (7 CFR 51.1520 through 51.1538).

Dated: March 14, 1986.

Thomas R. Clark,
Deputy Director, Fruit and Vegetable
Division.

[FR Doc. 86-6141 Filed 3-20-86; 8:45 am]

BILLING CODE 3410-02-M

NUCLEAR REGULATORY COMMISSION

10 CFR Part 50

Station Blackout

AGENCY: Nuclear Regulatory
Commission.

ACTION: Proposed rule.

SUMMARY: The Nuclear Regulatory Commission is proposing to amend its regulations to require that light-water-cooled nuclear power plants be capable of withstanding a total loss of alternating current (AC) electric power (called "station blackout") for a specified duration and maintaining reactor core cooling during that period. This proposed requirement is based on information developed under the Commission's study of Unresolved Safety Issue A-44, "Station Blackout." The proposed change is intended to provide further assurance that a station blackout (loss of both offsite power and onsite emergency AC power systems) will not adversely affect the public health and safety.

DATE: The comment period expires on June 19, 1986. Comments received after this date will be considered if it is practical to do so, but assurance of consideration cannot be given except as to comments received before this date.

ADDRESSES: Send comments to: The Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Attention: Docketing and Service Branch. Copies of comments received may be examined and copied for a fee at the NRC Public Document Room, 1717 H Street, NW., Washington, DC.

FOR FURTHER INFORMATION CONTACT: Alan Rubin, Division of Safety Review and Oversight, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Telephone: (301) 492-8303.

SUPPLEMENTARY INFORMATION: The alternating current (AC) electric power for essential and nonessential service in a nuclear power plant is supplied primarily by offsite power. Redundant onsite emergency AC power systems are also provided in the event that all offsite power sources are lost. These systems

provide power for various safety systems including reactor core decay heat removal and containment heat removal which are essential for preserving the integrity of the reactor core and the containment building, respectively. The reactor core decay heat can also be removed for a limited time period by safety systems that are independent of AC power.

The term "station blackout" means the loss of offsite AC power to the essential and nonessential electrical buses concurrent with turbine trip and the unavailability of the redundant onsite emergency AC power systems (e.g., as a result of units out of service for maintenance or repair, failure to start on demand, or failure to continue to run after start). If a station blackout persists for a sufficient time during which the capability of the AC-independent systems to remove decay heat is exceeded, core melt and containment failure could result.

The Commission's existing regulations establish requirements for the design and testing of onsite and offsite electric power systems that are intended to reduce the probability of losing all AC power to an acceptable level. (See General Design Criteria 17 and 18, 10 CFR Part 50, Appendix A.) The existing regulations do not require explicitly that nuclear power plants be designed to ensure that the core can be cooled and the integrity of the reactor coolant pressure boundary can be maintained for any specified period of loss of all AC power.

As operating experience has accumulated, the concern has arisen that the reliability of both the onsite and offsite emergency AC power systems might be less than originally anticipated, even for designs that meet the requirements of General Design Criteria 17 and 18. Many operating plants have experienced a total loss of offsite power, and more occurrences can be expected in the future. Also, operating experience with onsite emergency power systems has included many instances when diesel generators failed to start. In a few cases, there has been a complete loss of both the offsite and the onsite AC power systems. During these events, AC power was restored in a short time without any serious consequences.

In 1975, the results of the Reactor Safety Study (WASH-1400) showed that station blackout could be an important contributor to the total risk from nuclear power plant accidents. Although this total risk was found to be small, the relative importance of the station blackout accident was established. Subsequently, the Commission designated the issue of station blackout

as an Unresolved Safety Issue (USI); a Task Action Plan (TAP A-44) was issued in July 1980, and work was initiated to determine whether additional safety requirements were needed. Factors considered in the analysis of risk from station blackout included: (1) The likelihood and duration of the loss of offsite power; (2) the reliability of the onsite AC power system; and (3) the potential for severe accident sequences after a loss of all AC power, including consideration of the capability to remove core decay heat without AC power for a limited time period.

The technical findings of the staff's studies of the station blackout issue are presented in NUREG-1032, "Evaluation of Station Blackout Accidents at Nuclear Power Plants, Technical Findings Related to Unresolved Safety Issue A-44." Additional information is provided in supporting contractor reports: NUREG/CR-3228, "Station Blackout Accident Analyses" published in May 1983; NUREG/CR-2989, "Reliability of Emergency AC Power System at Nuclear Power Plants" published in July 1983; and NUREG/CR-3992, "Collection and Evaluation of Complete and Partial Losses of Offsite Power at Nuclear Power Plants" published in February 1985.² The major results of these studies are given below.

- Losses of offsite power can be characterized as those resulting from plant-centered faults, utility grid blackout, and severe weather-induced failures of offsite power sources. Based on operating experience, the frequency of total losses of offsite power in operating nuclear power plants was found to be about one per 10 site-years. The median restoration time was about one-half hour, and 90 percent of the offsite power losses were restored in approximately 3 hours (NUREG/CR-3992).

- The review of a number of representative designs of onsite emergency AC power systems has

¹ Draft NUREG-1032 was issued for public comment on June 15, 1985. Copies of this report are available for public inspection and copying for a fee at the NRC Public Document Room at 1717 H Street, NW., Washington, DC 20555. Free single copies of Draft NUREG-1032 may be requested by writing to the Publication Services Section, Room P-130A, Division of Technical Information and Document Control, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

² Copies of these documents are available for public inspection and copying for a fee at the NRC Public Document Room at 1717 H Street, NW., Washington, DC 20555. Copies may also be purchased by calling (202) 275-2171 or (202) 275-2080 or by writing to the Superintendent of Documents, U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20713-7082.

indicated a variety of potentially important failure causes. However, no single improvement was identified that could result in a significant improvement in overall diesel generator reliability. Data obtained from operating experience show that the typical individual emergency diesel generator failure rate is about 2.5×10^{-2} per demand (i.e., one chance of failure in 40 demands), and that the emergency AC power system unavailability for a plant which has two emergency diesel generators, one of which is required for decay heat removal, is about 2×10^{-2} per demand (NUREG/CR-2989).

- Given the occurrence of a station blackout, the likelihood of resultant core damage or core melt is dependent on the reliability and capability of decay heat removal systems that are not dependent on AC power. If sufficient AC-independent capability exists, additional time will be available to restore AC power needed for long-term cooling (NUREG/CR-3228).

It was determined by reviewing design, operational, and site-dependent factors that the expected frequency of core damage resulting from station blackout events could be maintained near or below 10^{-6} per reactor-year for any nuclear plant with readily achievable diesel generator reliabilities, provided that the plant is designed to cope with station blackout for a specified duration. The duration for a specific plant is based on a comparison of the plant's characteristics to those factors that have been identified as the main contributors to risk from station blackout (NUREG-1032).

As a result of the station blackout studies, improved guidance will be provided to licensees regarding maintaining minimum emergency diesel generator reliability to minimize the probability of losing all AC power. In addition, the Commission is proposing to amend its regulations by adding a new § 50.63 and by adding a new final paragraph to General Design Criterion 17, Appendix A of 10 CFR Part 50, to require that all nuclear power plants be capable of coping with a station blackout for some specified period of time. The period of time for specific plant would be determined based on the existing capability of the plant as well as a comparison of the individual plant design with factors that have been identified as the main contributors to risk of core melt resulting from station blackout.

These factors, which vary significantly from plant to plant because of considerable differences in design of plant electric power systems as well as

site-specific considerations, include: (1) Redundancy of onsite emergency AC power sources (i.e., number of sources minus the number needed for decay heat removal) (2) reliability of onsite emergency AC power sources (usually diesel generators), (3) frequency of loss of offsite power, and (4) probable time to restore offsite power. The frequency of loss of, and time to restore offsite power are related to grid and switchyard reliabilities, historical weather data for severe storms, and the availability of nearby alternate power sources (e.g., gas turbines). Experience has shown that long duration offsite power outages are caused primarily by severe storms (hurricanes, ice, snow, etc.).

The objective of the proposed rule is to reduce the risk of severe accidents resulting from station blackout by maintaining highly reliable AC electric power systems and, as additional defense-in-depth, assuring that plants can cope with a station blackout for some period of time. If the proposed rule is adopted, all licensees and applicants would be required to assess the capability of their plants to cope with a station blackout (i.e., determine the amount of time the plant can maintain core cooling and containment integrity with AC power unavailable), and to have procedures and training to cope with such an event. Plants would be required to be able to cope with a specified minimum duration station blackout selected on a plant-specific basis.

On the basis of station blackout studies conducted for USI A-44, and presented in the reports referenced above, the NRC staff has developed a draft regulatory guide entitled "Station Blackout,"³ which presents guidance on (1) maintaining a high level of reliability for emergency diesel generators, (2) developing procedures and training to restore offsite and onsite emergency AC power should either one or both become unavailable, and (3) selecting a plant-specific minimum duration for station blackout capability to comply with the proposed amendment to General Design Criterion 17. Application of the methods

in this guide would result in selection of a 4-hour or 8-hour station blackout duration, depending on the specific plant design and site-related characteristics. However, applicants and licensees could propose alternative methods to that specified in the regulatory guide in order to justify other minimum durations for station blackout capability.

If the proposed rule and regulatory guide are issued, those plants with an already low risk from station blackout would be required to withstand a station blackout for a relatively short period of time and probably would need few, if any, modifications as a result of the rule. Plants with currently higher risk from station blackout would be required to withstand somewhat longer duration blackouts. Depending on their existing capability, these plants might also need to make modifications (such as increasing station battery capacity or condensate storage tank capacity) in order to cope with the longer station blackout duration. The proposed rule would require licensees to develop, in consultation with the Office of Nuclear Reactor Regulation, proposed plant-specific schedules for implementation of any needed modifications.

Additional Comments by the Commission

The proposed rule does not require that a single failure be assumed concurrent with a station blackout because station blackout goes beyond the normal single failure criterion. That is, for a station blackout to occur, four AC power supplies must fail (two offsite sources and two safety-related onsite emergency AC sources). The staff's estimated probability of the concurrent failure of all four power supplies leads us to believe that the staff should give further consideration to upgrading to safety grade the plant modifications needed (if any) to meet the proposed rule. Upgrading to safety grade will further ensure appropriate licensee attention is paid to maintaining a high state of operability and reliability. The Commission believes that the question of quality classification of modifications should be addressed by interested parties in comments on the proposed rule.

In addition to comments on the merits of the proposed rule, the Commission specifically requests comments on whether the backfit analysis for this rule adequately implements the Backfit Rule, 10 CFR 50.109.

Additional Comments by Commissioners Roberts and Zech

We agree with soliciting public comments on the proposed rulemaking

on station blackout. We will be interested in comments received and staff responses associated with analysis of cost benefit, value impact, and safety improvements and the station blackout standing on the overall risk (e.g., is the reduction of risk only a small percentage of the overall risk or is it a major component of an already small risk?). This will be one of the first proposed rules to be evaluated by the NRC under its new backfitting requirements. We would be particularly interested in specific comments assessing whether or not this proposal meets the "substantial increase in the overall protection of the public health and safety" threshold now required by the backfit rule.

Separate Views of Commissioner Asselstine

I support the proposed rulemaking but believe substantial additional safety improvements beyond those called for in this rulemaking are achievable and practicable. How to prevent and mitigate a station blackout event is one of the most significant unresolved safety issues associated with nuclear power plants. Extended station blackout can result in core meltdown and loss of containment integrity. Since existing mitigation features such as containment spray would be inoperable, a station blackout could result in a large release of radioactive material to the environment.

Countries abroad that have made a serious commitment to nuclear power and to nuclear safety have, or are planning, backfit features which markedly reduce station blackout risks. For example, the new French 1300 MWe nuclear power plants are designed with a goal of coping with a station blackout for at least 20 hours. According to the NRC staff, the design features that provide this capability (listed below) permit the plant to withstand a station blackout for three days.

- A steam-driven generator provides power for a small positive displacement pump that supplies cooling for reactor coolant pump (RCP) seals and also provides power for instrumentation and controls and control room lighting necessary to withstand a station blackout. This design feature, which is also being backfitted onto all operating 900 MWe nuclear plants in France, addresses two factors that impact the ability to cope with a station blackout—RCP seal cooling with AC power unavailable and battery depletion.

- Two turbine-driven auxiliary feedwater (AFW) pumps included in the 1300 MWe French design in addition to two motor-driven AFW pumps. Most

³ A notice of availability and request for comments on the draft regulatory guide will be published within a few days of this Notice of Proposed Rulemaking. Copies of the draft regulatory guide are available for public inspection and copying for a fee at the NRC Public Document Room at 1717 H Street, NW., Washington, DC 20555, and will be distributed to those on the automatic distribution list for draft regulatory guides. Free single copies of the draft regulatory guide may be obtained by writing to the U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Director, Division of Technical Information and Document Control.

pressurized water reactors have turbine-driven AFW pump in addition to two-motor-driven pumps. Therefore, the French design provides additional redundancy in the AC-independent trains of the AFW system.

• Gravity feed back-up water supply from onsite sources to the condensate storage tank provides additional water for decay heat removal via the AFW system for long-duration station blackout events, i.e., up to three days.

This three-day station blackout capability would permit sufficient time to connect a mobile gas turbine generator to provide power if AC power could not be restored from other, preferred sources. A mobile gas turbine generator is located at, or in the vicinity of, every nuclear power plant site in France. These improvements in safety are being achieved at not unreasonable costs and are being driven by the French goal of achieving a probability of one in ten million (10^{-7}) per reactor-year for a major event such as station blackout. The Commission's rule proposes much less. It proposes an objective of one in one hundred thousand (10^{-4}) per reactor-year for station blackout caused core meltdown and an objective of only about four hours coping capability.

I would appreciate comments on whether the NRC should require substantial improvements in safety with respect to station blackout, like those being accomplished in other countries, which can be achieved at reasonable cost and which go beyond those proposed in this rulemaking.

Finding of No Significant Environmental Impact: Availability

The Commission has determined under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in Subpart A of 10 CFR Part 51, that this rule, if adopted, would not be a major Federal action significantly affecting the quality of the human environment, and therefore an environmental impact statement is not required. There would not be any adverse environmental impacts as a result of the proposed rule for the following reasons: (1) There would be no additional radiological exposure to the general public or plant employees, and no plant shutdown is not required as there would be no additional environmental impacts as a result of the need for replacement power. The environmental assessment and finding of no significant impact on which this determination is based are available for inspection and copying for a fee at the NRC Public Document Room, 1717 H Street, NW, Washington, DC 20555.

Single copies of the environmental

assessment and the finding of no significant impact are available from Mr. Warren Minners, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Telephone: (301) 492-7827.

Paperwork Reduction Act Statement

This proposed rule amends information collection requirements that are subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). This rule has been submitted to the Office of Management and Budget for review and approval of the paperwork requirements.

Regulatory Analysis

The Commission has prepared a regulatory analysis for this regulation. The analysis examines the costs and benefits of the rule as considered by the Commission. A copy of the regulatory analysis, NUREG-1109, For Comment, "Regulatory Analysis for the Resolution of Unresolved Safety Issue A-44, Station Blackout" (Published in January 1986), is available for inspection and copying for a fee at the NRC Public Document Room, 1717 H Street, NW, Washington, DC 20555. Free single copies of Draft NUREG-1109 may be obtained by writing to the Publication Services Section, Room P-130A, Division of Technical Information and Document Control, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

The Commission requests public comment on the regulatory analysis. Comments on the draft analysis may be submitted to the NRC as indicated under the addresses heading.

Regulatory Flexibility Certification

In accordance with the Regulatory Flexibility Act of 1980, 5 U.S.C. 605(b), the Commission hereby certifies that this proposed rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. This proposed rule specifies that nuclear power plants be able to withstand a total loss of AC power for a specified time duration and maintain reactor core cooling during that period. These facilities are licensed under the provisions of 10 CFR 50.21(b) and 10 CFR 50.22. The companies that own these facilities do not fall within the scope of "small entities" as set forth in the Regulatory Flexibility Act or the small business size standards set forth in regulations issued by the Small Business Administration in 13 CFR Part 121.

List of Subjects in 10 CFR Part 50

Antitrust, Classified Information, Fire prevention, Incorporation by reference,

Intergovernmental relations, Nuclear power plants and reactors, Penalty, Radiation protection, Reactor siting criteria, Reporting and recordkeeping requirements.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and 5 U.S.C. 553, the NRC is proposing to adopt the following amendments to 10 CFR Part 50.

PART 50—DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

1. The authority citation for Part 50 continues to read as follows:

Authority: Secs. 103, 104, 181, 182, 183, 188, 189, 68 Stat. 988, 937, 948, 953, 954, 955, 956, as amended, sec. 234, 85 Stat. 1244, as amended (42 U.S.C. 2133, 2134, 2201, 2232, 2233, 2238, 2239, sec. 201, 202, 206, 68 Stat. 1242, 1244, 1246, as amended (42 U.S.C. 5841, 5842, 5843), unless otherwise noted.

Section 50.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5851). Sections 50.57(d), 50.58, 50.91, and 50.92 also issued under Pub. L. 97-415, 96 Stat. 2071, 2073 (42 U.S.C. 2133, 2239). Section 50.78 also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Sections 50.80-50.81 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Sections 50.100-50.102 also issued under sec. 188, 68 Stat. 955 (42 U.S.C. 2238).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273), §§ 50.10(a), (b), and (c), 50.44, 50.46, 50.48, 50.54, and 50.80(a) are issued under sec. 181b, 68 Stat. 948, as amended (42 U.S.C. 2201(b)); §§ 50.10(b) and (c) and 50.54 are issued under sec. 161i, 68 Stat. 948, as amended (42 U.S.C. 2201(i)); and §§ 50.55(e), 50.59(b), 50.70, 50.71, 50.72, 50.73, and 50.78 are issued under sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

2. In § 50.2, a definition of "station blackout" is added in the alphabetical sequence to read as follows:

§ 50.2 Definitions.

"Station blackout" means the complete loss of alternating current (AC) electric power to the essential and nonessential switchgear buses in a nuclear power plant (i.e., loss of the offsite electric power system concurrent with turbine trip and unavailability of the onsite emergency AC power system).

3. A new § 50.83 is added to read as follows:

§ 50.63 Loss of all alternating current power.

(a) *Requirements.* Each light-water-cooled nuclear power plant licensed to operate must be able to withstand and recover from a station blackout as defined in § 50.2 for a specified duration in accordance with the requirements in paragraph (e) of General Design Criterion 17 of Appendix A of this part.

(b) *Limitation of Scope.* Paragraphs (c) and (d) of this section do not apply to those plants licensed to operate prior to [insert the effective date of this amendment] if the capability to withstand station blackout was considered in the operating license proceeding and a specified duration was accepted as the licensing basis for the facility.

(c) *Implementation—Determination of Station Blackout Duration.* (1) For each light-water-cooled nuclear power plant licensed to operate on or before [insert the effective date of this amendment], the licensee shall submit to the Director of the Office of Nuclear Reactor Regulation by [insert a date 270 days after the effective date of this amendment]:

(i) A determination of the maximum duration for which the plant as currently designed is able to maintain core cooling and containment integrity in the event of a station blackout as defined in § 50.2;

(ii) A description of the procedures that have been established for station blackout events for the duration determined in paragraph (c)(1)(i) of this section and for recovery therefrom;

(iii) An identification of the factor(s) that limit the capability of the plant to cope with a station blackout for a longer time than that determined in paragraph (c)(1)(i) of this section;

(iv) A proposed station blackout duration to be used in determining compliance with paragraph (e) of General Design Criterion 17 of Appendix A of this part, including a justification for the selection based on—

(A) The redundancy of the onsite emergency AC power sources;

(B) The reliability of the onsite emergency AC power sources;

(C) The expected frequency of loss of offsite power; and

(D) The probable time needed to restore offsite power; and

(v) An identification of the factors, if any, that limit the capability of the plant to meet the requirements of Criterion 17 for the specified station blackout duration proposed in the response to paragraph (c)(1)(iv) of this section.

(2) After consideration of the information submitted in accordance with paragraph (c)(1) of this section, the

Commission will notify the licensee of its determination of the specified station blackout duration to be used in determining compliance with General Design Criterion 17 of Appendix A of this part.

(d) Implementation—Schedule for Implementing Equipment Modifications.

(1) For each light-water-cooled nuclear power plant licensed to operate on or before [insert the effective date of this amendment], the licensee shall, within 180 days of the notification provided in accordance with paragraph (c)(2) of this section, submit to the Director of the Office of Nuclear Reactor Regulation a schedule for implementing any equipment and procedure modifications necessary to meet the requirements of General Design Criterion 17 of Appendix A of this part. This submittal must include an explanation of the schedule and a justification if the schedule does not provide for completion of the modifications within two years of the notification provided in accordance with paragraph (c)(2) of this section.

(2) The licensee and the NRC staff shall mutually agree upon a final schedule for implementing modifications necessary to comply with the requirements of Criterion 17.

4. In Appendix A, General Design Criterion 17 is revised to read as follows.

Appendix A—General Design Criteria for Nuclear Power Plants

II. Protection by Multiple Fission Product Barriers

Criterion 17—Electric power systems. (a) An onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

(b) The onsite electric power supplies, including the batteries, and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure.

(c) Electric power from the transmission network to the onsite electric distribution system shall be supplied by two physically independent circuits (not necessarily on separate rights of way) designed and located so as to minimize to the extent practical the

likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. A switchyard common to both circuits is acceptable. Each of these circuits shall be designed to be available in sufficient time following a loss of all onsite alternating current power supplies and the other offsite electric power circuit, to assure that specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. One of these circuits shall be designed to be available within a few seconds following a loss-of-coolant accident to assure the core cooling, containment integrity, and other vital safety functions are maintained.

(d) Provisions shall be included to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electric power supplies.

(e) The reactor core and associated coolant, control, and protection systems, including the station batteries, shall provide sufficient capacity and capability to assure that the core is cooled and containment integrity is maintained in the event of a station blackout (as defined in § 50.2) for a specified duration. The following factors shall be considered in specifying the station blackout duration: (1) the redundancy of the onsite emergency AC power sources, (2) the reliability of the onsite emergency AC power sources, (3) the expected frequency of loss of offsite power, and (4) the probable time needed to restore offsite power.

Dated at Washington, DC, this 17th day of March 1986.

For the Nuclear Regulatory Commission,
Samuel J. Chalk,
Secretary of the Commission.

Backfit Analysis

Analysis and Determination That the Proposed Rulemaking To Amend 10 CFR 50 Concerning Station Blackout Complies With the Backfit Rule 10 CFR 50.109

The Commission's existing regulations establish requirements for the design and testing of onsite and offsite electric power systems (10 CFR Part 50, Appendix A, General Design Criteria 17 and 18). However, as operating experience has accumulated, the concern has arisen regarding the reliability of both the offsite and onsite emergency AC power systems. These systems provide power for various safety systems including reactor core decay heat removal and containment heat removal which are essential for preserving the integrity of the reactor core and the containment building, respectively. In numerous instances emergency diesel generators have failed to start and run during tests conducted at operating plants. In addition, a

number of operating plants have experienced a total loss of offsite electric power, and more such occurrences are expected. Existing regulations do not require explicitly that nuclear power plants be designed to withstand the loss of all AC power for any specified period.

This issue has been studied by the staff as part of Unresolved Safety Issue (USI) A-44, "Station Blackout." Both deterministic and probabilistic analyses were performed to determine the timing and consequences of various accident sequences and to identify the dominant factors affecting the likelihood of core melt accidents from station blackout. These studies indicate that station blackout can be a significant contributor to the overall plant risk. Consequently, the Commission is proposing to amend its regulations to require that plants be capable of withstanding a total loss of AC power for a specified duration and to maintain reactor core cooling during that period.

An analysis of the benefits and costs of implementing the proposed station blackout rule is presented in NUREG-1109, Draft Report For Comment, "Regulatory Analysis for the Resolution of Unresolved Safety Issue A-44, Station Blackout."⁴ The benefit from implementing the proposed rule is a reduction in the frequency of core melt per reactor-year due to station blackout and the associated risk of offsite radioactive releases. The risk reduction for 87 operating reactors is estimated to be 80,000 person-rem.⁵

The cost for licensees to comply with the proposed backfit would vary depending on the existing capability of each plant to cope with a station blackout, as well as the specified station blackout duration for that plant. The costs would be primarily for licensees to develop procedures, to improve diesel generator reliability if the reliability falls below certain levels, and to retrofit plants with additional components or systems, as necessary, to meet the proposed requirements.

⁴ Draft NUREG-1109 was issued for public comment in January 1986. Copies of this report are available for inspection and copying for a fee at the NRC Public Document Room, 1717 H Street, NW., Washington, DC 20540. Three single copies of Draft NUREG-1109 may be obtained by writing to the Publication Services Section, Room P-1030A, Division of Technical Information and Document Control, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

⁵ The value-impact analysis in NUREG-1109 was based on plant-specific information for a total of 87 reactors. Although there are currently about 100 operating reactors, the overall value-impact ratio in NUREG-1109 would not change significantly because of the increase in the number of operating plants.

The estimated total cost for 87 operating reactors to comply with the proposed resolution of USI A-44 is about \$40 million. The average cost per reactor would be around \$600,000 ranging from \$200,000 if only a station blackout assessment and procedures and training are necessary, to a maximum of about \$4 million if substantial modifications are needed, including requalification of a diesel generator.

The overall value-impact ratio, not including accident avoidance costs, is about 2,000 person-rem averted per million dollars. If cost savings to industry from accident avoidance (i.e., cleanup and repair of onsite damages and replacement power) were included, the overall value-impact ratio would improve significantly to about 8,000 person-rem averted per million dollars.

This analysis supports a determination that a substantial increase in the protection of the public health and safety will be derived from the backfit in the proposed station blackout rule, and that the backfit is justified in view of the direct and indirect costs of implementing the proposed rule.

The quantitative value-impact analysis discussed above was one of the factors considered in evaluating the proposed rule, but other factors also played a part in the decision-making process. Probabilistic risk assessment (PRA) studies performed for this USI, as well as some plant-specific PRAs, have shown that station blackout can be a significant contributor to core melt frequency and, with consideration of containment failure, station blackout events can represent an important contributor to reactor risk. In general, active containment systems required for heat removal, pressure suppression, and radioactivity removal from the containment atmosphere following an accident are unavailable during a station blackout. Therefore, the offsite risk is higher from a core melt resulting from station blackout than it is from many other accident scenarios.

Although there are licensing requirements for guidance directed at providing reliable offsite and onsite AC power, experience has shown that there are practical limitations in ensuring the reliability of offsite and onsite emergency AC power systems. Potential vulnerabilities to common cause failures associated with design, operational and environmental factors can affect AC power system reliability. For example, if potential common cause failures of emergency diesel generators exist (e.g., in service-water or DC power support

systems), then the estimated core damage frequency from station blackout events can increase significantly.

The estimated frequency of core damage from station blackout events is directly proportional to the frequency of the initiating event. Estimates of station blackout frequencies for this USI were based on actual operational experience. This is assumed to be a realistic indicator of future performance. An argument can be made that the future performance will be better than the past. For example, when problems with the offsite power grid arise, they are fixed, and therefore, grid reliability should improve. On the other hand, grid power failures may become more frequent because fewer plants are being built, and more power is being transmitted between regions, thus placing greater stress on transmission lines.

A number of foreign countries, including France, Britain, Sweden, Germany and Belgium, have taken steps to reduce the risk from station blackout events. These steps include adding design features to enhance the capability of the plant to cope with a station blackout for a substantial period of time, and/or adding redundant and diverse emergency AC power sources.

The factors discussed above support the determination that additional defense in depth provided by the ability of a plant to cope with station blackout for a specific duration is warranted. The Commission has considered how this backfit should be prioritized and scheduled in light of other regulatory activities ongoing at operating nuclear power plants. Station blackout warrants a high priority ranking based on both its status as an "unresolved safety issue" and the results and conclusions reached in resolving this issue. As noted in the implementation section of the proposed rule (§ 50.63(d)), the schedule for equipment modification (if needed to meet the requirements of the proposed rule) shall be mutually agreed upon by the licensee and NRC. Modifications that cannot be scheduled for completion within two years after NRC accepts the licensee's specified station blackout duration must be justified by the licensee.

Analysis of 50.109(c) Factors

1. Statement of the specific objectives that the proposed backfit is designed to achieve.

The NRC staff has completed a review and evaluation of information developed over the past 5 years on Unresolved Safety Issue (USI) A-44, Station Blackout. As a result of these efforts, the NRC is proposing to amend 10 CFR Part

50, by the introduction of new § 50.63, "Station Blackout," and an additional paragraph to General Design Criterion 17, "Electric Power Systems" in Appendix A.

The objective of the proposed rule is to reduce the risk of severe accidents associated with station blackout by making station blackout a relatively small contributor to total core melt frequency. Specifically, the proposed rule would require all light-water-cooled nuclear power plants to be able to cope with a station blackout for a specified duration, and to have procedures and training for such an event. A draft Regulatory Guide, to be issued along with the proposed rule, would provide an acceptable method to determine the station blackout duration for each plant. The duration would be determined for each plant based on a comparison of the individual plant design with factors that have been identified as the main contributors to risk of core melt resulting from station blackout. These factors are: (1) The redundancy of onsite emergency AC power sources, (2) the reliability of onsite emergency AC power sources, (3) the frequency of loss of offsite power and (4) the probable time needed to restore offsite power.

2. General description of the activity that would be required by the licensee or applicant in order to complete the backfit.

In order to assure that each nuclear power plant is able to withstand and recover from a station blackout for a specified minimum duration, licensees would be required to assess their plants' capability to withstand and recover from a station blackout. This evaluation would include:

- Verifying the adequacy of station battery power, condensate storage tank capacity, and plant/instrument air for the station blackout duration.
- Verifying adequate reactor coolant pump seal integrity for the station blackout duration so that seal leakage due to lack of seal cooling would not result in a sufficient primary system coolant inventory reduction to lose the ability to cool the core.
- Verifying operability of equipment needed to operate during a station blackout for environmental conditions associated with total loss of AC power (i.e., loss of heating, ventilation and air conditioning).

Depending on the plant's existing capability to cope with a station blackout, licensees may or may not need to backfit hardware modifications (e.g., adding battery capacity) to comply with the proposed rule. (See item 8 for additional discussion.) Licensees would be required to have procedures and

training to cope with and recover from a station blackout.

3. Potential change in the risk to the public from the accidental off-site release of radioactive material.

Based on an analysis of potential consequences presented in Section 4 of NUREG-1109, if the proposed rule were implemented, the estimated total risk reduction to the public from 67 operating reactors is 80,000 person-rem.

4. Potential impact on radiological exposure of facility employees.

For 67 operating reactors, the estimated total reduction in occupational exposure resulting from reduced core melt frequencies and associated post-accident cleanup and repair activities is 2,000 person-rem (Table 8 in NUREG-1109). No increase in occupational exposure is expected from operation and maintenance or implementing the proposed rule. Equipment additions and modifications contemplated do not require work in and around the reactor coolant system and therefore would not be expected to result in significant radiation exposure (Table 8 in NUREG-1109).

5. Installation and continuing costs associated with the backfit, including the cost of facility downtime or the cost of construction delay.

For 67 operating reactors, the total estimated cost for assessing the station blackout coping capability, procedures and training, installation of hardware backfits (if necessary), plant downtime, and operation and maintenance is \$40 million. (See Tables 6 and 8 in NUREG-1109).

6. The potential safety impact of changes in plant or operational complexity, including the relationship to proposed and existing regulatory requirements.

The proposed rule for plants to be able to cope with a station blackout should not add to plant or operational complexity. The relationship between the proposed station blackout rule and proposed and existing regulatory requirements is discussed in Section 4.2 of NUREG-1109. This discussion includes the following NRC generic programs:

- Generic Issue B-58 "Proposed Actions for Enhancing Reliability of Diesel Generators at Operating Plants,"
- Generic Issue 23, "Reactor Coolant Pump Seal Failures,"
- USI A-45, "Shutdown Decay Heat Removal Requirements,"
- Generic Issue A-30, "Adequacy of Safety-Related DC Power Supply."

7. The estimated resource burden on the NRC associated with the proposed backfit and the availability of such resources.

For 67 operating reactors, the estimated total cost for NRC review of industry submittals required by the proposed rule is \$500,000 (based on an estimated average of 120 person-hours per reactor; see Table 8 in NUREG-1109).

8. The potential impact of differences in facility type, design or age on the relevancy and practicality of the proposed backfit.

The proposed rule applies to all pressurized water reactors and boiling water reactors. However, in determining the specific minimum station blackout coping capability for each plant, differences in plant design (e.g., number of emergency generators) and the reliability of the offsite and onsite emergency AC power systems could result in different coping capabilities. For example, plants with an already low risk from station blackout would be required to withstand a station blackout for a relatively short period of time; and now, if any, hardware backfits would be required as a result of the proposed rule. Plants with currently higher risk from station blackout would be required to withstand somewhat longer duration blackouts; and, depending on their existing capability, may need some modifications to achieve the longer station blackout capability.

9. Whether the proposed backfit is interim or final and, if interim, the justification for imposing the proposed backfit on an interim basis.

The proposed rule is a final resolution of USI A-44; it is not an interim measure.

[FR Doc. 86-6284 Filed 3-20-86; 8:45 am]
BILLING CODE 7550-01-M

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 71

[Airspace Docket No. 86-ASW-1]

Proposed Amendment of Transition Area; Dallas/Fort Worth, TX

Correction

In FR Doc. 86-4939, beginning on page 7950, in the issue of Friday, March 7, 1986, make the following corrections:

1. On page 7951, third column, thirty-first line, at the end insert "to latitude 33°13'00" N.,".

2. On same page, third column, thirty-fourth line, before "thence" insert "longitude 97°39'30" W.,".

BILLING CODE 1505-01-M

PLANT NAME	ALTERNATE AC	COPING TIME		AAC	Coping
Arkansas Nuclear 1 & 2	DG	4 hours	2	x	
Beaver Valley 1 & 2	EDG	4 hours	2	x	
Braidwood 1 & 2	EDG	4 hours	2	x	
Browns Ferry 1,2 & 3	EDG (AC assist - not AAC)	4 hours	3		x
Brunswick 1,2	EDG	4 hours	2	x	
Byron 1,2	EDG	4 hours	2	x	
Callaway	No	4 hours	1		x
Calvert Cliffs 1,2	Non- class 1E DG	4 hours	2	x	
Catawba 1 & 2	Appendix R EDG	4 hours	2	x	
Clinton	HPCS DG (AC assist - not AAC)	4 hours	1		x
Columbia Generating Station	HPCS DG (AC assist - not AAC)	4 hours	1		x
Comanche Peak 1,2	No	4 hours	2		x
Cooper Nuclear Station	No	4 hours	1		x
Crystal River 3	No	4 hours	1		x
D.C. Cook 1 & 2	No	4 hours	2		x
Davis-Besse	Non- class 1E DG	4 hours	1	x	
Diablo Canyon 1 & 2	No	4 hours	2		x
Dresden 2 & 3	2 Non- class 1E DGs	4 hours	2	x	
Duane Arnold	No	4 hours	1		x
Farley 1 & 2	EDG	4 hours	2	x	
Fermi 2	Non- class 1E CTG	4 hours	1	x	
FitzPatrick	No	4 hours	1		x
Fort Calhoun	No	4 hours	1		x
Ginna	No	4 hours	1		x
Grand Gulf 1	No	4 hours			x
Harris 1	No	4 hours			x
Hatch 1 & 2	EDG	4 hours	2	x	
Hope Creek 1	No	4 hours	1		x
Indian Point 2	GTGs	8 hours	1	x	

Indian Point 3	DG	4 hours	1	x	
Kewaunee	DG	4 hours	1	x	
La Salle 1 & 2	No	4 hours	2		x
Limerick 1 & 2	EDG	4 hours	2	x	
McGuire 1 & 2	Apendix R DG	4 hours	2	x	
Millstone 2	EDG	8 hours	1	x	
Millstone 3	Non-class 1E DG	8 hours	1	x	
Monticello	No	4 hours	1		x
Nine Mile Point 1 & 2	No	4 hours	2		x
North Anna 1 & 2	Non-class 1E DG	4 hours	2	x	
Oconee 1,2 & 3	Apendix R EDG	4 hours	3	x	
Oyster Creek	2 Non-class 1E CTGs	4 hours	1	x	
Palisades	No	4 hours	1		x
Palo Verde 1,2 & 3	2 Non-class 1E GTGs	4 hours (Revised to	3	x	
Peach Bottom 2 & 3	Hydro	8 hours	2	x	
Perry 1	HPCS DG (AC assist - not AAC)	4 hours	1		x
Pilgrim 1	Non-class 1E DG	8 hours	1	x	
Point Beach 1 & 2	Non-class 1E GTG	8 hours	2	x	
Prairie Island 1 & 2	EDG	4 hours	2	x	
Quad Cities 1 & 2	2 Non-class 1E DGs	4 hours	2	x	
River Bend 1	No	4 hours	1		x
Robinson 2	Apendix R EDG	8 hours	1	x	
Saint Lucie 1 & 2	EDG	4 hours	2	x	
Salem 1 & 2	No	4 hours	2		x
San Onofre 2 & 3	No	4 hours	2		x
Seabrook 1	No	4 hours			x
Sequoyah 1 & 2	No	4 hours			x
South Texas 1 & 2	EDG	8 hours	2	x	
Summer	No	4 hours	1		x
Surry 1 & 2	DG	4 hours	2		

Susquehanna 1 & 2	No	4 hours	2		x
Three Mile Island 1	Non-class 1E DG	4 hours	1	x	
Turkey Point 3 & 4	EDG	8 hours	2	x	
Vermont Yankee	Non-class 1E Hydro	8 hours	1	x	
Vogtle 1 & 2	No	4 hours	2		x
Waterford 3	No	4 hours	1		x
Watts Bar 1	No	4 hours	1		x
Wolf Creek 1	No	4 hours	1		x
TOTAL				60 units	44 units

10 sites with 8 hr 104
 1 site with 16 hr
 56 sites with 4 hr



REGULATORY GUIDE

OFFICE OF NUCLEAR REGULATORY RESEARCH

REGULATORY GUIDE 1.155
(Task 81 501-4)Reissued
to correct
Tables 1,
5, and 6.

STATION BLACKOUT

A. INTRODUCTION

Criterion 17, "Electric Power Systems," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," includes a requirement that an onsite electric power system and an offsite electric power system be provided to permit functioning of structures, systems, and components important to safety.

Criterion 1, "Quality Standards and Records," of Appendix A to 10 CFR Part 50 includes a requirement for a quality assurance program to provide adequate assurance that structures, systems, and components important to safety will perform their safety functions.

Criterion 18, "Inspection and Testing of Electric Power Systems," of Appendix A to 10 CFR Part 50 includes a requirement for appropriate periodic testing and inspection of electric power systems important to safety.

The Commission has amended its regulations in 10 CFR Part 50. Paragraph (a), "Requirements," of § 50.63, "Loss of All Alternating Current Power," requires that each light-water-cooled nuclear power plant be able to withstand and recover from a station blackout (i.e., loss of the offsite electric power system concurrent with reactor trip and unavailability of the onsite emergency ac electric power system) of a specified duration. Section 50.63 requires that, for the station blackout duration, the plant be capable of maintaining core cooling and appropriate containment integrity. It also identifies the factors that must be considered in specifying the station blackout duration.

Criteria 1 and 18 of Appendix A to 10 CFR Part 50 apply to safety-related equipment needed to cope with station blackout and other safety functions. Appendix A of

this regulatory guide provides quality assurance guidance for non-safety systems and equipment used to meet the requirements of § 50.63.

This guide describes a method acceptable to the NRC staff for complying with the Commission regulation that requires nuclear power plants to be capable of coping with a station blackout for a specified duration. This guide applies to all light-water-cooled nuclear power plants.

The Advisory Committee on Reactor Safeguards has been consulted concerning this guide and has concurred in the regulatory position.

Any information collection activities related to this regulatory guide are contained as requirements in the revised 10 CFR Part 50 that provides the regulatory basis for this guide. The information collection requirements in Part 50 have been cleared under the Office of Management and Budget Clearance No. 3150-0011.

B. DISCUSSION

The term "station blackout" refers to the complete loss of alternating current electric power to the essential and nonessential switchgear buses in a nuclear power plant. Station blackout therefore involves the loss of offsite power concurrent with turbine trip and failure of the onsite emergency ac power system, but not the loss of available ac power to buses fed by station batteries through inverters or the loss of power from "alternate ac sources." Station blackout and alternate ac source are defined in § 50.2. Because many safety systems required for reactor core decay heat removal and containment heat removal are dependent on ac power, the consequences of a station blackout could be severe. In the event of a station blackout, the capability to cool the reactor core would be dependent on the availability

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This guide was issued after consideration of comments received from the public. Comments and suggestions for improvements in these guides are encouraged at all times, and guides will be revised, as appropriate, to accommodate comments and to reflect new information or experience.

Written comments may be submitted to the Rules and Procedures Branch, DRR, ADM, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

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- | | |
|-----------------------------------|-----------------------------------|
| 1. Power Reactors | 6. Products |
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of systems that do not require ac power from the essential and nonessential switchgear buses and on the ability to restore ac power in a timely manner.

The concern about station blackout arose because of the accumulated experience regarding the reliability of ac power supplies. Many operating plants have experienced a total loss of offsite electric power, and more occurrences are expected in the future. In almost every one of these loss-of-offsite-power events, the onsite emergency ac power supplies have been available immediately to supply the power needed by vital safety equipment. However, in some instances, one of the redundant emergency ac power supplies has been unavailable. In a few cases there has been a complete loss of ac power, but during these events ac power was restored in a short time without any serious consequences. In addition, there have been numerous instances when emergency diesel generators have failed to start and run in response to tests conducted at operating plants.

The results of the Reactor Safety Study (Ref. 1) showed that, for one of the two plants evaluated, a station blackout event could be an important contributor to the total risk from nuclear power plant accidents. Although this total risk was found to be small, the relative importance of station blackout events was established. This finding and the accumulated diesel generator failure experience increased the concern about station blackout.

In a Commission proceeding addressing station blackout, it was determined that the issue should be analyzed to identify preventive or mitigative measures that can or should be taken. (See Florida Power & Light Company (St. Lucie Nuclear Power Plant, Unit No. 2) ALAB-603, 12 NRC 30 (1980); modified CLI-81-12, 13 NRC 838 (1981).)

The issue of station blackout involves the likelihood and duration of the loss of offsite power, the redundancy and reliability of onsite emergency ac power systems, and the potential for severe accident sequences after a loss of all ac power. References 2 through 7 provide detailed analyses of these topics. Based on the studies performed to date, the results indicate that estimated core melt frequencies from station blackout vary considerably for different plants and could be a significant risk contributor for some plants. In order to reduce this risk, action should be taken to resolve the safety concern stemming from station blackout. The issue is of concern for both PWRs and BWRs.

This guide primarily addresses the following three areas: (1) maintaining highly reliable ac electric power systems, (2) developing procedures and training to restore offsite and onsite emergency ac power should either one or both become unavailable, and (3) ensuring that plants can cope with a station blackout for some period of time based on the probability of occurrence of a station blackout at a site as well as the capability for restoring ac power in a timely fashion for that site.

One factor that affects ac power system reliability is the vulnerability to common cause failures associated

with design, operational, and environmental factors. Existing standards and regulatory guides include specific design criteria and guidance on the independence of preferred (offsite) power circuits (see General Design Criterion 17, "Electric Power Systems," and Section 5.1.3 of Reference 8) and the independence of and limiting interactions between diesel generator units at a nuclear station (see General Design Criterion 17, Regulatory Guide 1.6, "Independence Between Redundant Standby (Onsite) Power Sources and Between Their Distribution Systems," Regulatory Guide 1.75, "Physical Independence of Electric Systems," and Reference 9). In developing the recommendations in this guide, the staff has assumed that by adhering to such standards, licensees have minimized to the extent practical, single-point vulnerabilities in design and operation that could result in a loss of all offsite power or all onsite emergency ac power.

Onsite emergency ac power system unavailability can be affected by outages resulting from testing and maintenance. Typically, this unavailability is about 0.007 (Reference 5), which is small compared to the minimum emergency diesel generator reliability specified in Regulatory Position 1.1 of this regulatory guide (i.e., 0.95 or 0.975 reliability per demand). However, in some cases outages due to maintenance can be a significant contributor to emergency diesel generator unavailability. This contribution can be kept low by having high-quality test and maintenance procedures and by scheduling regular diesel generator maintenance at times when the reactor is shut down. Also, limiting conditions for operation in the technical specifications are designed to limit the diesel generator unavailability when the plant is operating. As long as the unavailability due to testing and maintenance is not excessive, the maximum emergency diesel generator failure rates for each diesel generator specified in Regulatory Position 1.1 would result in acceptable overall reliability for the emergency ac power system.

Based on § 50.63, all licensees and applicants are required to assess the capability of their plants to maintain adequate core cooling and appropriate containment integrity during a station blackout and to have procedures to cope with such an event. This guide presents a method acceptable to the NRC staff for determining the specified duration for which a plant should be able to withstand a station blackout in accordance with these requirements. The application of this method results in selecting a minimum acceptable station blackout duration capability from 2 to 16 hours, depending on a comparison of the plant's characteristics with those factors that have been identified as significantly affecting the risk from station blackout. These factors include redundancy of the onsite emergency ac power system (i.e., the number of diesel generators available for decay heat removal minus the number needed for decay heat removal), the reliability of onsite emergency ac power sources (e.g., diesel generators), the frequency of loss of offsite power, and the probable time to restore offsite power.

Licensees may propose durations different from those specified in this guide. The basis for alternative durations

would be predicated on plant-specific factors relating to the reliability of ac power systems such as those discussed in Reference 2.

The information submitted to comply with § 50.63 is also required to be incorporated in an update to the FSAR in accordance with paragraph 50.71(e)(4). It is expected that the applicant or licensee will have available for review, as required, the analyses and related information supporting the submittal.

Concurrent with the development of this regulatory guide, and consistent with discussions with the NRC staff, the Nuclear Management and Resource Council (NUMARC) has developed guidelines and procedures for assessing station blackout coping capability and duration for light water reactors (NUMARC-8700, Ref. 10). The NRC staff has reviewed these guidelines and analysis methods and concludes that NUMARC-8700 provides guidance for conformance to § 50.63 that is in large part identical to the guidance provided in this regulatory guide. Table 1 of this regulatory guide provides a section-by-section comparison between Regulatory Guide 1.155 and NUMARC-8700. The use of NUMARC-8700 is further discussed in Section C, Regulatory Position, of this guide.

C. REGULATORY POSITION

This regulatory guide describes a means acceptable to the NRC staff for meeting the requirements of § 50.63 of 10 CFR Part 50. NUMARC-8700 (Ref. 10) also provides guidance acceptable to the staff for meeting these requirements. Table 1 provides a cross-reference to NUMARC-8700 and notes where the regulatory guide takes precedence.

1. ONSITE EMERGENCY AC POWER SOURCES (EMERGENCY DIESEL GENERATORS)

1.1 Emergency Diesel Generator Target Reliability Levels

The minimum emergency diesel generator (EDG) reliability should be targeted at 0.95 per demand for each EDG for plants in emergency ac (EAC) Groups A, B, and C and at 0.975 per demand for each EDG for plants in EAC Group D (see Table 2). These reliability levels will be considered minimum target reliabilities and each plant should have an EDG reliability program containing the principal elements, or their equivalent, outlined in Regulatory Position 1.2. Plants that select a target EDG reliability of 0.975 will use the higher level as the target in their EDG reliability programs.

The EDG reliability for determining the coping duration for a station blackout will be determined as follows:

1. Calculate the most recent EDG reliability for each EDG based on the last 20, 50, and 100 demands using definitions and methodology in Section 2 of NSAC-108, "Reliability of Emergency

Diesel Generators at U.S. Nuclear Power Plants" (Ref. 11), or equivalent.¹

2. Calculate the nuclear unit "average" EDG reliability for the last 20, 50, and 100 demands by averaging the results from step 1 above.

3. Compare the calculated "average" nuclear unit EDG reliability from step 2 above against the following criteria:

Last 20 demands > 0.90 reliability
Last 50 demands > 0.94 reliability
Last 100 demands > 0.95 reliability

4. If the EAC group is A, B, or C AND any of the three evaluation criteria in step 3 are met, the nuclear unit may select an EDG reliability target of either 0.95 or 0.975 for determining the applicable coping duration from Table 2.

If the EAC group is D and any of the three evaluation criteria in step 3 are met, the allowed EDG reliability targets 0.975.

5. If the EAC group is A, B, or C and NONE of the selection criteria in step 3 are met, an EDG reliability level of 0.95 must be used for determining the applicable coping duration from Table 2. Additionally, if the "averaged" nuclear unit EDG reliability is less than 0.90 based on the last 20 demands, the acceptability of a coping duration based on an EDG reliability of 0.95 from Table 2 must be further justified.

If the EAC group is D and NONE of the three evaluation criteria in step 3 are met, the required coping duration (derived by using Table 2) should be increased to the next highest coping level (i.e., 4 hours to 8 hours, 8 hours to 16 hours).

1.2 Reliability Program

The reliable operation of onsite emergency ac power sources should be ensured by a reliability program designed to maintain and monitor the reliability level of each power source over time for assurance that the selected reliability levels are being achieved. An EDG reliability program would typically be composed of the following elements or activities (or their equivalent):

1. Individual EDG reliability target levels consistent with the plant category and coping duration selected from Table 2.
2. Surveillance testing and reliability monitoring programs designed to track EDG performance and to support maintenance activities.

¹This EDG reliability is not suitable for probabilistic risk analyses for design basis accidents because of the differing EDG start-reliability requirement that would be applicable for such probabilistic risk analyses.

3. A maintenance program that ensures that the target EDG reliability is being achieved and that provides a capability for failure analysis and root-cause investigations.
4. An information and data collection system that services the elements of the reliability program and that monitors achieved EDG reliability levels against target values.
5. Identified responsibilities for the major program elements and a management oversight program for reviewing reliability levels being achieved and ensuring that the program is functioning properly.

1.3 Procedures for Restoring Emergency AC Power

Guidelines and procedures for actions to restore emergency ac power when the emergency ac power system is unavailable should be integrated with plant-specific technical guidelines and emergency operating procedures developed using the emergency operating procedure upgrade program established in response to Supplement 1, "Requirements for Emergency Response Capability" (Generic Letter No. 82-33),² to NUREG-0737, "Clarification of TMI Action Plan Requirements" (Ref. 12).

2. OFFSITE POWER

Procedures should include the actions necessary to restore offsite power and use nearby power sources when offsite power is unavailable. As a minimum, the following potential causes for loss of offsite power should be considered:

- Grid undervoltage and collapse
- Weather-induced power loss
- Preferred power distribution system faults⁴ that could result in the loss of normal power to essential switchgear buses

3. ABILITY TO COPE WITH A STATION BLACKOUT

The ability to cope with a station blackout for a certain time provides additional defense-in-depth should both offsite and onsite emergency ac power systems fail concurrently. Regulatory Position 3.1 provides a method to determine an acceptable minimum time that a plant should be able to cope with a station blackout based on

² Modifications or additions to generic technical guidelines that are necessary to deal with a station blackout for the specific plant design should be identified as deviations in the plant-specific technical guidelines as required by Supplement 1 to NUREG-0737 (Ref. 12) and outlined in NUREG-0899, "Guidelines for the Preparation of Emergency Operating Procedures" (Ref. 13).

³ This includes such items as nearby or onsite gas turbine generators, portable generators, hydro generators, and black-start fossil power plants.

⁴ Includes such failures as the distribution system hardware, switching and maintenance errors, and lightning-induced faults.

the probability of a station blackout at the site as well as the capability for restoring ac power for that site. Each nuclear power plant has the capability to remove decay heat and maintain appropriate containment integrity without ac power for a limited period of time. Regulatory Position 3.2 provides guidance for determining the length of time that a plant is actually able to cope with a station blackout. If the plant's actual station blackout capability is significantly less than the acceptable minimum duration, modifications may be necessary to extend the plant's ability to cope with a station blackout. Should plant modifications be necessary, Regulatory Position 3.3 provides guidance on making such modifications. Whether or not modifications are necessary, procedures and training for station blackout events should be provided according to the guidance in Regulatory Position 3.4.

3.1 Minimum Acceptable Station Blackout Duration Capability

Each nuclear power plant should be able to withstand and recover from a station blackout lasting a specified minimum duration. The specified duration of station blackout should be based on the following factors:

1. The redundancy of the onsite emergency ac power system (i.e., the number of power sources available minus the number needed for decay heat removal),
2. The reliability of each of the onsite emergency ac power sources (e.g., diesel generator),
3. The expected frequency of loss of offsite power, and
4. The probable time needed to restore offsite power.

A method for determining an acceptable minimum station blackout duration capability as a function of the above site- and plant-related characteristics is given in Table 2. Tables 3 through 8 provide the necessary detailed descriptions and definitions of the various factors used in Table 2. Table 3 identifies different levels of redundancy of the onsite emergency ac power system used to define the emergency ac power configuration groups in Table 2. Table 4 provides definitions of the three offsite power design characteristic groups used in Table 2. The groups are defined according to various combinations of the following factors: (1) independence of offsite power (I), (2) severe weather (SW), (3) severe weather recovery (SWR), and (4) extremely severe weather (ESW). The definitions of the factors I, SW, SWR, and ESW are provided in Tables 5 through 8, respectively. After identifying the appropriate groups from Tables 3 and 4 and the reliability level of the onsite emergency ac power sources (determined in accordance with Regulatory Position 1.1), Table 2 can be used to determine the acceptable minimum station blackout duration capability for each plant.

3.2 Evaluation of Plant-Specific Station Blackout Capability

Each nuclear power plant should be evaluated to determine its capability to withstand and recover from a station blackout of the acceptable duration determined for that plant (see Regulatory Position 3.1). The following considerations should be included when determining the plant's capability to cope with a station blackout.

3.2.1. The evaluation should be performed assuming that the station blackout event occurs while the reactor is operating at 100% rated thermal power and has been at this power level for at least 100 days.

3.2.2. The capability of all systems and components necessary to provide core cooling and decay heat removal following a station blackout should be determined, including station battery capacity, condensate storage tank capacity, compressed air capacity, and instrumentation and control requirements.

3.2.3. The ability to maintain adequate reactor coolant system inventory to ensure that the core is cooled should be evaluated, taking into consideration shrinkage, leakage from pump seals, and inventory loss from letdown or other normally open lines dependent on ac power for isolation.

3.2.4. The design adequacy and capability of equipment needed to cope with a station blackout for the required duration and recovery period should be addressed and evaluated as appropriate for the associated environmental conditions. This should include consideration as appropriate of the following:

1. Potential failures of equipment necessary to cope with the station blackout,
2. Potential environmental effects on the operability and reliability of equipment necessary to cope with the station blackout, including possible effects of fire protection systems,
3. Potential effects of other hazards, such as weather, on station blackout response equipment (e.g., auxiliary equipment to operate onsite buses or to recover EDGs and other equipment as needed),
4. Potential habitability concerns for those areas that would require operator access during the station blackout and recovery period.

Evaluations that have already been performed need not be duplicated. For example, if safety-related equipment required during a total loss of ac power has been qualified to operate under environmental conditions exceeding those expected under a station blackout (e.g., loss of heating, ventilation, and air conditioning), additional analyses need not be performed. Equipment will be considered acceptable for station blackout temperature

environments if an assessment has been performed that provides reasonable assurance that the required equipment will remain operable.

3.2.5. Consideration should be given to using available non-safety-related equipment, as well as safety-related equipment, to cope with a station blackout provided such equipment meets the recommendations of Regulatory Positions 3.3.3 and 3.3.4. Onsite or nearby alternate ac (AAC) power sources that are independent and diverse from the normal Class 1E emergency ac power sources (e.g., gas turbine, separate diesel engine, steam supplies) will constitute an acceptable station blackout coping capability provided an analysis is performed that demonstrates the plant has this capability from the onset of station blackout until the AAC power source or sources are started and lined up to operate all equipment necessary to cope with station blackout for the required duration.

In general, equipment required to cope with a station blackout during the first 8 hours should be available on the site. For equipment not located on the site, consideration should be given to its availability and accessibility in the time required, including consideration of weather conditions likely to prevail during a loss of offsite power.

If the AAC source or sources meet the recommendations of Section 3.3.5 and can be demonstrated by test to be available to power the shutdown buses within 10 minutes of the onset of station blackout, no coping analysis is required.

3.2.6. Consideration should be given to timely operator actions inside or outside the control room that would increase the length of time that the plant can cope with a station blackout provided it can be demonstrated that these actions can be carried out in a timely fashion. For example, if station battery capacity is a limiting factor in coping with a station blackout, shedding nonessential loads on the batteries could extend the time until the battery is depleted. If load shedding or other operator actions are considered, corresponding procedures should be incorporated into the plant-specific technical guidelines and emergency operating procedures.

3.2.7. The ability to maintain "appropriate containment integrity" should be addressed. "Appropriate containment integrity" for station blackout means that adequate containment integrity is ensured by providing the capability, independent of the preferred and blacked-out unit's onsite emergency ac power supplies, for valve position indication and closure for containment isolation valves that may be in the open position at the onset of a station blackout. The following valves are excluded from consideration:

1. Valves normally locked closed during operation,
2. Valves that fail closed on a loss of power,

3. Check valves,

4. Valves in nonradioactive closed-loop systems not expected to be breached in a station blackout (this does not include lines that communicate directly with containment atmosphere), and

5. Valves of less than 3-inch nominal diameter.

3.3 Modifications To Cope with Station Blackout

If the plant's station blackout capability, as determined according to the guidance in Regulatory Position 3.2, is significantly less than the minimum acceptable plant-specific station blackout duration (as developed according to Regulatory Position 3.1 or as justified by the licensee or applicant on some other basis and accepted by the staff), modifications to the plant may be necessary to extend the time the plant is able to cope with a station blackout. If modifications are needed, the following items should be considered:

3.3.1. If, after considering load shedding to extend the time until battery depletion, battery capacity must be extended further to meet the station blackout duration recommended in Regulatory Position 3.1, it is considered acceptable either to add batteries or to add a charging system for the existing batteries that is independent of both the offsite and the blacked-out unit's onsite emergency ac power systems, such as a dedicated diesel generator.

3.3.2. If the capacity of the condensate storage tank is not sufficient to remove decay heat for the station blackout duration recommended in Regulatory Position 3.1, a system meeting the requirements of Regulatory Position 3.5 to resupply the tank from an alternative water source is an acceptable means to increase its capacity provided any power source necessary to provide additional water is independent of both the offsite and the blacked-out unit's onsite emergency ac power systems.

3.3.3. If the compressed air capacity is not sufficient to remove decay heat and to maintain appropriate containment integrity for the station blackout duration recommended in Regulatory Position 3.1, a system to provide sufficient capacity from an alternative source that meets Regulatory Position 3.5 is an acceptable means to increase the air capacity provided any power source necessary to provide additional air is independent of both the offsite and the blacked-out unit's onsite emergency ac power systems.

3.3.4. If a system is required for primary coolant charging and makeup, reactor coolant pump seal cooling or injection, decay heat removal, or maintaining appropriate containment integrity specifically to meet the station blackout duration recommended in Regulatory Position 3.1, the following criteria should be met:

1. The system should be capable of being actuated and controlled from the control room, or if

other means of control are required, it should be demonstrated that these steps can be carried out in a timely fashion, and

2. If the system must operate within 10 minutes of a loss of all ac power, it should be capable of being actuated from the control room.

3.3.5. If an AAC power source is selected specifically for satisfying the requirements for station blackout, the design should meet the following criteria:

1. The AAC power source should not normally be directly connected to the preferred or the blacked-out unit's onsite emergency ac power system.
2. There should be a minimum potential for common-cause failure with the preferred or the blacked-out unit's onsite emergency ac power sources. No single-point vulnerability should exist whereby a weather-related event or single active failure could disable any portion of the blacked-out unit's onsite emergency ac power sources or the preferred power sources and simultaneously fail the AAC power source.
3. The AAC power source should be available in a timely manner after the onset of station blackout and have provisions to be manually connected to one or all of the redundant safety buses as required. The time required for making this equipment available should not be more than 1 hour as demonstrated by test. If the AAC power source can be demonstrated by test to be available to power the shutdown buses within 10 minutes of the onset of station blackout, no coping analysis is required.
4. The AAC power source should have sufficient capacity to operate the systems necessary for coping with a station blackout for the time required to bring and maintain the plant in safe shutdown.
5. The AAC power system should be inspected, maintained, and tested periodically to demonstrate operability and reliability. The reliability of the AAC power system should meet or exceed 95 percent as determined in accordance with NSAC-108 (Ref. 11) or equivalent methodology.

An AAC power source serving a multiple-unit site where onsite emergency ac sources are not shared between units should have, as a minimum, the capacity and capability for coping with station blackout in any of the units.

At sites where onsite emergency sources are shared between units, the AAC power sources should have the capacity and capability to ensure that all units can be brought to and maintained in safe shutdown (i.e., those plant conditions defined in plant technical specifications

as Hot Standby or Hot Shutdown, as appropriate). Plants have the option of maintaining the RCS at normal operating temperatures or at reduced temperatures.

Plants that have more than the required redundancy of emergency ac sources for loss-of-offsite-power conditions, on a per nuclear unit basis, may use one of the existing emergency sources as an AAC power source provided it meets the applicable criteria for an AAC source. Additionally, emergency diesel generators with 1-out-of-2-shared and 2-out-of-3-shared ac power configurations may not be used as AAC power sources.

3.3.6. If a system or component is added specifically to meet the recommendations on station blackout duration in Regulatory Position 3.1, system walk downs and initial tests of new or modified systems or critical components should be performed to verify that the modifications were performed properly. Failures of added components that may be vulnerable to internal or external hazards within the design basis (e.g., seismic events) should not affect the operation of systems required for the design basis accident.

3.3.7. A system or component added specifically to meet the recommendations on station blackout duration in Regulatory Position 3.1 should be inspected, maintained, and tested periodically to demonstrate equipment operability and reliability.

3.4 Procedures and Training To Cope with Station Blackout

Procedures⁵ and training should include all operator actions necessary to cope with a station blackout for at least the duration determined according to Regulatory

⁵Procedures should be integrated with plant-specific technical guidelines and emergency operating procedures developed using the emergency operating procedure upgrade program established in response to Supplement 1 of NUREG-0737 (Ref. 12). The task analysis portion of the emergency operating procedure upgrade program should include an analysis of instrumentation adequacy during a station blackout.

Position 3.1 and to restore normal long-term core cooling/decay heat removal once ac power is restored.

3.5 Quality Assurance and Specification Guidance for Station Blackout Equipment That Is Not Safety-Related

Appendices A and B provide guidance on quality assurance (QA) activities and specifications respectively for non-safety-related equipment used to meet the requirements of § 50.63 and not already covered by existing QA requirements in Appendix B or R of Part 50. Appropriate activities should be implemented from among those listed in these appendices depending on whether the non-safety equipment is being added (new) or is existing. This QA guidance is applicable to non-safety systems and equipment for meeting the requirements of § 50.63 of 10 CFR Part 50. The guidance on QA and specifications incorporates a lesser degree of stringency by eliminating requirements for involvement of parties outside the normal line organization. NRC inspections will focus on the implementation and effectiveness of the quality controls described in Appendices A and B. Additionally, the equipment installed to meet the station blackout rule must be implemented such that it does not degrade the existing safety-related systems. This is to be accomplished by making the non-safety-related equipment as independent as practicable from existing safety-related systems. The non-safety systems identified in Appendix B are acceptable to the NRC staff for responding to a station blackout.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the NRC staff's plans for using this regulatory guide. Except in those cases in which the applicant or licensee proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method described in this guide may be used in the evaluation of submittals by applicants for construction permits and operating licenses (as appropriate) and will be used to evaluate licensees who are required to comply with § 50.63, "Loss of All Alternating Current Power," of 10 CFR Part 50.

TABLE 1

**CROSS-REFERENCE BETWEEN REGULATORY
GUIDE 1.155 AND NUMARC-8700**

Regulatory Position in R.G. 1.155	Section in NUMARC-8700
1.1	3.2.3, 3.2.4
1.2	Appendix D
1.3	4.2.1, 4.3.1
2	4.2.2, 4.3.2
3.1	3
3.2.1	2.2.1, 2.2.2
3.2.2	2.9, 7.2.1, 7.2.2, 7.2.3
3.2.3	2.5
3.2.4	2.7, 4.2.1, 4.2.2, 7.2.4, Appendices E and F
3.2.5	7.1.1, 7.1.2, Appendices B and C
3.2.6	4.2.1, 4.3.1, 7.2.1, 7.2.2, 7.2.3
3.2.7	2.10, 7.2.5
3.3.1	7.2.2
3.3.2	7.2.1
3.3.3	7.2.3
3.3.4	2.5
3.3.5	2.3.1, 7.1.1, 7.1.2, Appendices A, B, and C
3.3.6	None (Use Regulatory Guide 1.155)
3.3.7	4.2.1(12), 4.3.1(12), Appendices A and B
3.4	4
3.5	None (Use Regulatory Guide 1.155)
Appendix A	None (Use Regulatory Guide 1.155)
Appendix B	None (Use Regulatory Guide 1.155)

TABLE 2

ACCEPTABLE STATION BLACKOUT DURATION CAPABILITY (HOURS)^a

Offsite Power Design Characteristic Group ^d	Emergency AC Power Configuration Group ^b						
	A		B		C		D
	Unit "Average" EDG Reliability ^c						
	0.975	0.95	0.975	0.95	0.975	0.95	0.975
P1	2	2	4	4	4	4	4
P2	4	4	4	4	4	8	8
P3	4	8	4	8	8	16	8

^aVariations from these times will be considered by the staff if justification, including a cost-benefit analysis, is provided by the licensee. The methodology and sensitivity studies presented in NUREG-1031 (Ref. 2) are acceptable for use in this justification.

^bSee Table 3 to determine emergency ac power configuration group.

^cSee Regulatory Position 1.1.

^dSee Table 4 to determine groups P1, P2, and P3.

TABLE 3
EMERGENCY AC POWER CONFIGURATION GROUPS^a

EAC Power Configuration Group	Number of EAC Power Sources ^b	Number of EAC Power Sources Required To Operate AC-Powered Decay Heat Removal Systems ^c
A	3 ^d 4	1 1
B	4 5	2 2
C	2 ^d 3 ^e	1 1
D	2 ^f 3 4 5	1 2 3 3

^aSpecial-purpose dedicated diesel generators, such as those associated with high-pressure core spray systems at some BWRs, are not counted in the determination of EAC power configuration groups.

^bIf any of the EAC power sources are shared among units at a multi-unit site, this is the total number of shared and dedicated sources for those units at the site.

^cThis number is based on all the ac loads required to remove decay heat (including ac-powered decay heat removal systems) to achieve and maintain safe shutdown at all units at the site with offsite power unavailable.

^dFor EAC power sources not shared with other units.

^eFor EAC power sources shared with another unit at a multi-unit site.

^fFor shared EAC power sources in which each diesel generator is capable of providing ac power to more than one unit at a site concurrently.

TABLE 4
OFFSITE POWER DESIGN CHARACTERISTIC GROUPS

Group	Offsite Power Design Characteristics			
Sites that have any combination of the following factors:				
	I ^a	SW ^b	SWR ^c	ESW ^d
P1	1 or 2	1 or 2	1 or 2	1 or 2
	1 or 2	1	1 or 2	3
	1 or 2	3	1	1 or 2
P2	All other sites not in P1 or P3.			
Sites that expect to experience a total loss of offsite power caused by grid failures at a frequency equal to or greater than once in 20 site-years, unless the site has procedures to recover ac power from reliable alternative (nonemergency) power sources within approximately one-half hour following grid failure.				
or				
Sites that have any combination of the following factors:				
P3	I	SW	SWR	ESW
	Any I	5	2	Any ESW
	Any I	1,2,3, or 4	1 or 2	5
	Any I	5	1	Any ESW
	Any I	4	2	1,2,3, or 4
	1 or 2	3	2	4
	3	3	2	3 or 4

^aSee Table 5 for definitions of independence of offsite power (I) groups.

^bSee Table 6 for definitions of severe weather (SW) groups.

^cSee Table 7 for definitions of severe weather recovery (SWR) groups.

^dSee Table 8 for definitions of extremely severe weather (ESW) groups.

TABLE 5
DEFINITIONS OF INDEPENDENCE OF OFFSITE POWER GROUPS

Category	I		
	1	2	3
1. Independence of offsite power sources	<p>1. All offsite power sources are connected to the plant through two or more switchyards or separate incoming transmission lines, but at least one of the ac sources is electrically independent of the others. (The independent 69-kV line in Figure 1 is representative of this design feature.)</p> <p align="center">OR</p>	<p>1.a. All offsite power sources are connected to the plant through one switchyard</p> <p align="center">OR</p> <p>1.b. All offsite power sources are connected to the plant through two or more switchyards, and the switchyards are electrically connected. (The 345- and 138-kV switchyards in Figures 2 and 3 represent this design feature.)</p>	
2. Automatic and manual transfer schemes for the Class 1E buses when the normal source of ac power fails and when the back-up sources of offsite power fail.	<p>2.a. After loss of the normal ac source,</p> <p>(1) There is an automatic transfer of all safe-shutdown buses to a separate preferred alternate power source.</p> <p>(2) There is an automatic transfer of all safe-shutdown buses to one preferred power source. If this preferred power source fails, there is another automatic transfer to the remaining preferred power sources or to alternate offsite power source.</p> <p align="center">OR</p> <p>2.b. Each safe-shutdown bus is normally connected to a separate preferred alternate power source with automatic or manual transfer capability between the preferred or alternate sources.</p>	<p>2.a. After loss of the normal ac power source, there is an automatic transfer of all safe-shutdown buses to one preferred alternate power source. If this source fails, there may be one or more manual transfers of power source to the remaining preferred or alternate offsite power sources.</p> <p align="center">OR</p> <p>2.b. The safe-shutdown buses are normally aligned to the same preferred power source with either an automatic or manual transfer to the remaining preferred or alternate ac power source.</p>	<p>2.a. If the normal source of ac power fails, there are no automatic transfers and one or more manual transfers of all safe-shutdown buses to preferred or alternate offsite power sources.</p> <p align="center">OR</p> <p>There is one automatic transfer and no manual transfer of all safe-shutdown buses to one preferred or one alternate offsite power source.</p>

TABLE 6
DEFINITIONS OF SEVERE WEATHER (SW) GROUPS

SW Group	Estimated Frequency of Loss of Offsite Power Due to Severe Weather, f (per Site-Year)*	
1		$f < 3.3 \times 10^{-3}$
2	3.3×10^{-3}	$\leq f < 1 \times 10^{-2}$
3	1×10^{-2}	$\leq f < 3.3 \times 10^{-2}$
4	3.3×10^{-2}	$\leq f < 1 \times 10^{-1}$
5	1×10^{-1}	$\leq f$

*The estimated frequency of loss of offsite power due to severe weather, f , is determined by the following equation:

$$f = (1.3 \times 10^{-4})h_1 + (b)h_2 + (0.012)h_3 + (c)h_4$$

where h_1 = annual expectation of snowfall for the site, in inches

h_2 = annual expectation of tornadoes (with wind speeds greater than or equal to 113 miles per hour) per square mile at the site

$b = 12.5$ for sites with transmission lines on two or more rights-of-way spreading out in different directions from the switchyard, or

$b = 72.3$ for sites with transmission lines on one right-of-way

h_3 = annual expectation of storms at the site with wind velocities between 75 and 124 mph

h_4 = annual expectation of hurricanes at the site

$c = 0$ if switchyard is not vulnerable to the effects of salt spray

$c = 0.78$ if switchyard is vulnerable to the effects of salt spray

The annual expectation of snowfall, tornadoes, and storms may be obtained from National Weather Service data from the weather station nearest to the plant or by interpolation, if appropriate, between nearby weather stations. The basis for the empirical equation for the frequency of loss of offsite power due to severe weather, f , is given in Appendix A to Reference 2.

TABLE 7
DEFINITIONS OF SEVERE WEATHER RECOVERY (SWR) GROUPS

SWR Group	Definition
1	Sites with enhanced recovery (i.e., sites that have the capability and procedures for restoring offsite (nonemergency) ac power to the site within 2 hours following a loss of offsite power due to severe weather).
2	Sites without enhanced recovery.

TABLE 8
DEFINITIONS OF EXTREMELY SEVERE WEATHER (ESW) GROUPS

ESW Group	Annual expectation of storms at a site with wind velocities equal to or greater than 125 miles per hour (e)
1	$e < 3.3 \times 10^{-4}$
2	$3.3 \times 10^{-4} \leq e < 1 \times 10^{-3}$
3	$1 \times 10^{-3} \leq e < 3.3 \times 10^{-3}$
4	$3.3 \times 10^{-3} \leq e < 1 \times 10^{-2}$
5	$1 \times 10^{-2} \leq e$

*The annual expectation of storms may be obtained from National Weather Service data from the weather station nearest to the plant or by interpolation, if appropriate, between nearby weather stations.

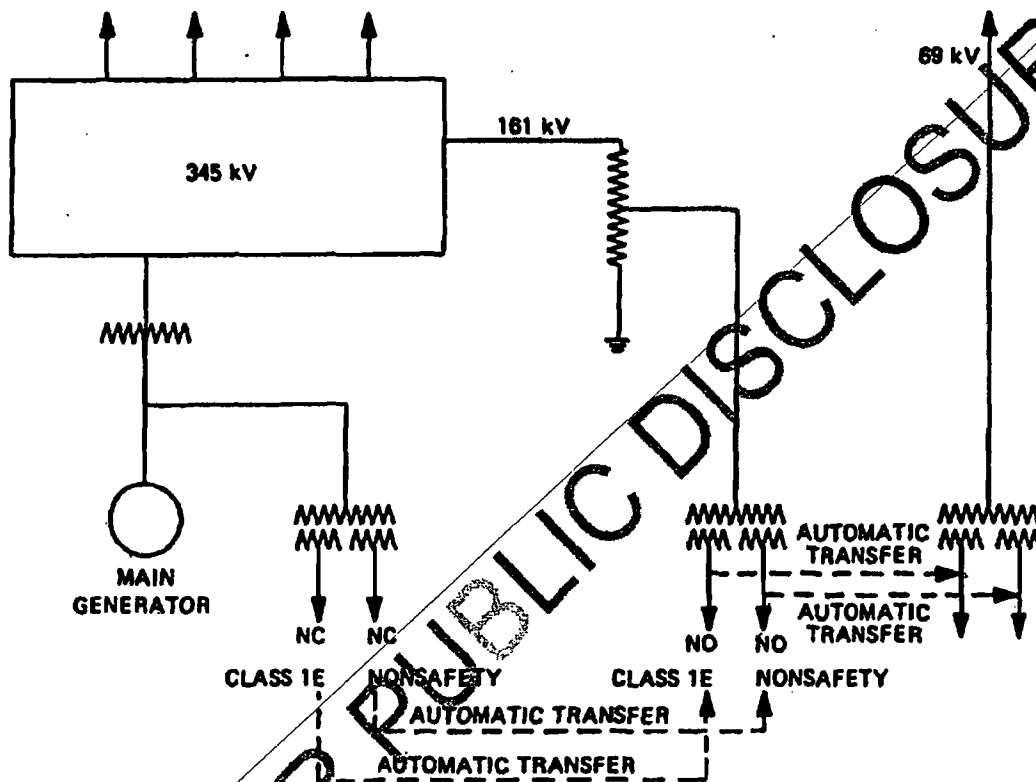


Figure 1. Schematic Diagram of Electrically Independent Transmission Line

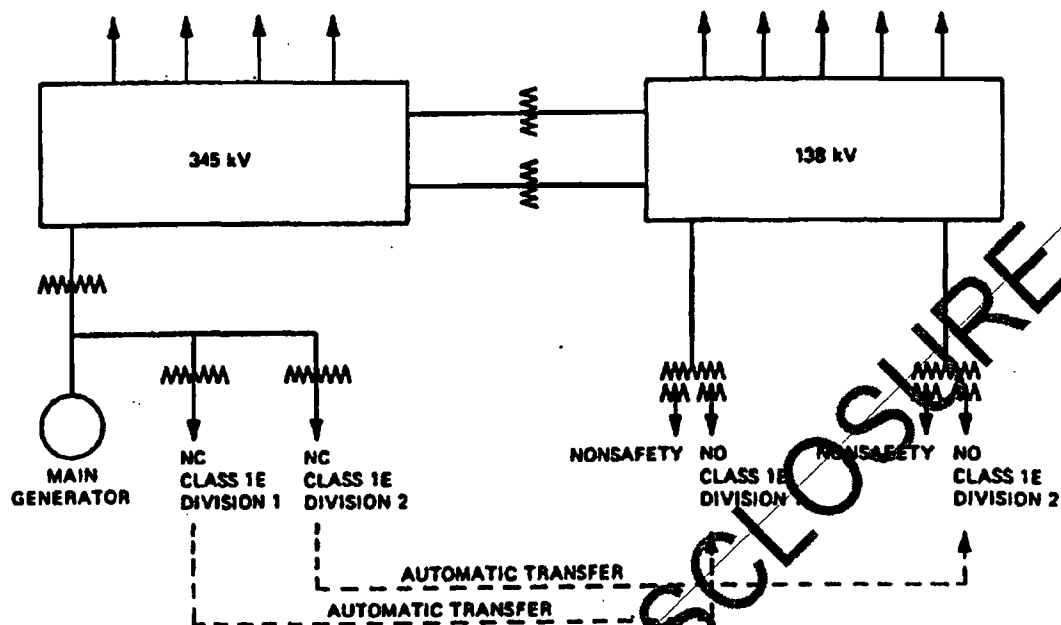


Figure 2. Schematic Diagram of Two Switchyards Electrically Connected (One-Unit Site)

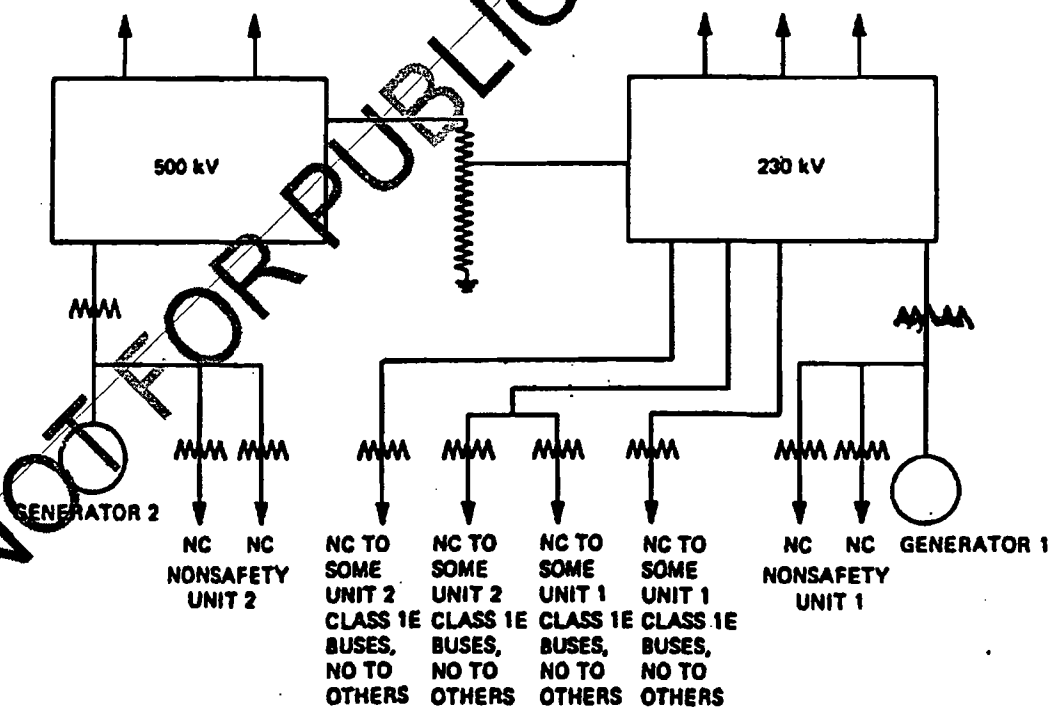


Figure 3. Schematic Diagram of Two Switchyards Electrically Connected (Two-Unit Site)

REFERENCES

1. U.S. Nuclear Regulatory Commission, "Reactor Safety Study," WASH-1400, October 1975.¹
2. U.S. Nuclear Regulatory Commission, "Evaluation of Station Blackout Accidents at Nuclear Power Plants, Technical Findings Related to Unresolved Safety Issue A-44," NUREG-1032, June 1988.¹
3. A. M. Rubin, "Regulatory/Backfit Analysis for the Resolution of Unresolved Safety Issue A-44, Station Blackout," U.S. Nuclear Regulatory Commission, NUREG-1109, June 1988.¹
4. U.S. Nuclear Regulatory Commission, "Collection and Evaluation of Complete and Partial Losses of Offsite Power at Nuclear Power Plants," NUREG/CR-3992 (ORNL/TM-9384), February 1985.¹
5. U.S. Nuclear Regulatory Commission, "Reliability of Emergency AC Power System at Nuclear Power Plants," NUREG/CR-2989 (ORNL/TM-8545), July 1983.¹
6. U.S. Nuclear Regulatory Commission, "Emergency Diesel Generator Operating Experience, 1981-1983," NUREG/CR-4347 (ORNL/TM-9739), December 1985.¹
7. U.S. Nuclear Regulatory Commission, "Station Blackout Accident Analyses (Part of NRC Task Action Plan A-44)," NUREG/CR-3226 (SAND82-2450), May 1983.¹
8. Institute of Electrical and Electronics Engineers, "IEEE Standard for Preferred Power Supply for Nuclear Power Generating Stations," IEEE Std 765-1983, June 1983.²
9. Institute of Electrical and Electronics Engineers, "IEEE Standard Criteria for Diesel-Generator Units Applied as Standby Power Supplies for Nuclear Power Generating Stations," IEEE Std 382-1984, June 1984.²
10. Nuclear Management and Resources Council, "Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors," NUMARC-8700, November 1987.³
11. Electric Power Research Institute, "Reliability of Emergency Diesel Generators at U.S. Nuclear Power Plants," NSAC-108, September 1986.⁴
12. U.S. Nuclear Regulatory Commission, "Clarification of TMI Action Plan Requirements: Requirements for Emergency Response Capability" (Generic Letter 82-33), Supplement 1 to NUREG-0737, January 1983.¹
13. U.S. Nuclear Regulatory Commission, "Guidelines for the Preparation of Emergency Operating Procedures," NUREG-0899, August 1982.¹

¹NRC publications may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Post Office Box 37082, Washington, DC 20013-7082; or from the National Technical Information Service, Springfield, VA 22161.

²Copies may be obtained from the Institute of Electrical and Electronics Engineers Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855.

³Copies may be obtained from the Nuclear Management and Resources Council, 1776 Eye Street NW., Washington, DC 20006.

⁴Copies may be obtained from the Electric Power Research Institute, Research Reports Center, P.O. Box 50490, Palo Alto, CA 94309.

APPENDIX A

QUALITY ASSURANCE GUIDANCE FOR NON-SAFETY SYSTEMS AND EQUIPMENT

The QA guidance provided here is applicable to non-safety systems and equipment used to meet the requirements of § 50.63 and not already explicitly covered by existing QA requirements in 10 CFR Part 50 in Appendix B or R. Additionally, non-safety equipment installed to meet the station blackout rule must be implemented so that it does not degrade the existing safety-related systems. This is accomplished by making the non-safety equipment as independent as practicable from existing safety-related systems. The guidance provided in this section outlines an acceptable QA program for non-safety equipment used for meeting the station blackout rule and not already covered by existing QA requirements. Activities should be implemented from this section as appropriate, depending on whether the equipment is being added (new) or is existing.

1. Design Control and Procurement Document Control

Measures should be established to ensure that all design-related guidelines used in complying with § 50.63 are included in design and procurement documents, and that deviations therefrom are controlled.

2. Instructions, Procedures, and Drawings

Inspections, tests, administrative controls, and training necessary for compliance with § 50.63 should be prescribed by documented instructions, procedures, and drawings and should be accomplished in accordance with these documents.

3. Control of Purchased Material, Equipment, and Services

Measures should be established to ensure that purchased material, equipment, and services conform to the procurement documents.

4. Inspection

A program for independent inspection of activities required to comply with § 50.63 should be established and executed by (or for) the organization performing the activity to verify conformance with documented installa-

tion drawings and test procedures for accomplishing the activities.

5. Testing and Test Control

A test program should be established and implemented to ensure that testing is performed and verified by inspection and audit to demonstrate conformance with design and system readiness requirements. The tests should be performed in accordance with written test procedures; test results should be properly evaluated and acted on.

6. Inspection, Test, and Operating Status

Measures should be established to identify items that have satisfactorily passed required tests and inspections.

7. Nonconforming Items

Measures should be established to control items that do not conform to specified requirements to prevent inadvertent use or installation.

8. Corrective Action

Measures should be established to ensure that failures, malfunctions, deficiencies, deviations, defective components, and nonconformances are promptly identified, reported, and corrected.

9. Records

Records should be prepared and maintained to furnish evidence that the criteria enumerated above are being met for activities required to comply with § 50.63.

10. Audits

Audits should be conducted and documented to verify compliance with design and procurement documents, instructions, procedures, drawings, and inspection and test activities developed to comply with § 50.63.

APPENDIX B

GUIDANCE REGARDING SYSTEM AND STATION EQUIPMENT SPECIFICATIONS

	Alternate AC Sources	Alternate Battery Systems
Safety-Related Equipment (Compliance with IEEE-279)	Not required, but the existing Class 1E electrical systems must continue to meet all applicable safety-related criteria.	Not required, but the existing Class 1E battery systems must continue to meet all applicable safety-related criteria.
Redundancy	Not required.	Not required.
Diversity from Existing EDGs	See Regulatory Position 3.3.5 of this guide.	Not required.
Independence from Existing Safety-Related Systems	Required if connected to Class 1E buses. Separation to be provided by 2 circuit breakers in series (1 Class 1E at the Class 1E bus and 1 non-Class 1E).	Required if connected to Class 1E battery systems. Separation to be provided by 2 circuit breakers in series (1 Class 1E at the Class 1E bus and 1 non-Class 1E).
Seismic Qualification	Not required.	Not required.
Environmental Consideration	If normal cooling is lost, needed for station blackout event only and not for design basis accident (DBA) conditions. Procedures should be in place to effect the actions necessary to maintain acceptable environmental conditions for the required equipment. See Regulatory Position 3.2.4.	If normal cooling is lost, needed for station blackout event only and not for accident conditions. Procedures should be in place to effect the actions necessary to maintain acceptable environmental conditions for the required equipment. See Regulatory Position 3.2.4.
Capacity	Specified in § 50.63 and Regulatory Position 3.3.5.	Specified in § 50.63 and Regulatory Position 3.3.1.
Quality Assurance	Indicated in Regulatory Position 3.5.	Indicated in Regulatory Position 3.5.
Technical Specification for Maintenance, Limiting Condition, FSAR, etc.	Should be consistent with the Interim Commission Policy Statement on Technical Specifications (Federal Register Notice 52 FR 3789) as applicable.	Should be consistent with the Interim Commission Policy Statement on Technical Specifications (Federal Register Notice 52 FR 3789) as applicable.
Instrumentation and Monitoring	Must meet system functional requirements.	Must meet system functional requirements.
Single Failure	Not required.	Not required.
Common Cause Failure (CCF)	Design should, to the extent practicable, minimize CCF between safety-related and non-safety-related systems.	Design should, to the extent practicable, minimize CCF between safety-related and non-safety-related systems.

APPENDIX B (Continued)

	Water Source (Existing Condensate Storage Tank or Alternative)	Instrument Air (Compressed Air System)	Water Delivery System (Alternative to Auxiliary Feedwater System, RCIC System, or Isolation Condenser Makeup)
Safety-Related Equipment (Compliance with IEEE-279)	Not required, but the existing Class 1E systems must continue to meet all applicable safety-related criteria.	Not required, but the existing Class 1E systems must continue to meet all applicable safety-related criteria.	Not required, but the existing Class 1E systems must continue to meet all applicable safety-related criteria.
Redundancy	Not required.	Not required.	Not required.
Diversity	Not required.	Not required.	Not required.
Independence from Safety-Related Systems	Ensure that the existing safety functions are not compromised, including the capability to isolate components, subsystems, or piping, if necessary.	Ensure that the existing safety functions are not compromised, including the capability to isolate components, subsystems, or piping, if necessary.	Ensure that the existing safety functions are not compromised, including the capability to isolate components, subsystems, or piping, if necessary.
Seismic Qualification	Not required.	Not required.	Not required.
Environmental Consideration	Need for station blackout event only and not for DBA conditions. See Regulatory Position 3.2.4. Procedures should be in place to effect the actions necessary to maintain acceptable environmental conditions for required equipment.	Needed for station blackout event only and not for DBA conditions. See Regulatory Position 3.2.4. Procedures should be in place to effect the actions necessary to maintain acceptable environmental conditions for required equipment.	Needed for station blackout event only and not for DBA conditions. See Regulatory Position 3.2.4. Procedures should be in place to effect the actions necessary to maintain acceptable environmental conditions for required equipment.
Capacity	Capability to provide sufficient water for core cooling in the event of a station blackout for the specified duration to meet § 50.63 and this regulatory guide.	Sufficient compressed air to components, as necessary, to ensure that the core is cooled and appropriate containment integrity is maintained for the specified duration of station blackout to meet § 50.63 and this regulatory guide.	The capacity to provide sufficient cooling water flow to ensure that the core is cooled in the event of a station blackout for the specified duration to meet § 50.63 and this regulatory guide.
Quality Assurance	As indicated in Regulatory Position 3.5.	As indicated in Regulatory Position 3.5.	As indicated in Regulatory Position 3.5.
Technical Specifications for Maintenance, Surveillance, Limiting Condition, FSAR, etc.	Should be consistent with the Interim Commission Policy Statement on Technical Specifications (Federal Register Notice 52 FR 3789) as applicable.	Should be consistent with the Interim Commission Policy Statement on Technical Specifications (Federal Register Notice 52 FR 3789) as applicable.	Should be consistent with the Interim Commission Policy Statement on Technical Specifications (Federal Register Notice 52 FR 3789) as applicable.
Instrumentation and Monitoring	Must meet system functional requirements.	Must meet system functional requirements.	Must meet system functional requirements.
Single Failure	Not required.	Not required.	Not required.

APPENDIX B (Continued)

	Water Source (Existing Condensate Storage Tank or Alternative)	Instrument Air (Compressed Air System)	Water Delivery System (Alternative to Auxiliary Feedwater System, RCIC System, or Isolation Condenser Makeup)
Common Cause Failure (CCF)	Design should, to the extent practicable, minimize CCF between safety-related and non-safety-related systems.	Design should, to the extent practicable, minimize CCF between safety-related and non-safety-related systems.	Design should, to the extent practicable, minimize CCF between safety-related and non-safety-related systems.

NOT FOR PUBLIC DISCLOSURE

APPENDIX B (Continued)

	RCS Makeup System (PWRs and BWRs Without RCIC)	Isolation Condenser (BWRs Without RCIC)	Instrumentation and Control Room Indications for Verifica- tion of RCS Natural Circulation (PWRs and BWRs Without RCIC)
Safety-Related Equipment (Com- pliance with IEEE-279)	Not required, but the existing Class 1E systems must continue to meet all applicable safety- related criteria.	Not required, but the existing Class 1E systems must continue to meet all applicable safety- related criteria.	Not required, but the existing Class 1E systems must continue to meet all applicable safety- related criteria.
Redundancy	Not required.	Not required.	Not required.
Diversity	Not required.	Not required.	Not required.
Independence from Safety- Related Systems	<ol style="list-style-type: none"> 1. Safety-grade isolation devices required between this RCS makeup system and existing safety-related makeup water systems. 2. A malfunction of this non- safety-grade makeup system should not affect the design safety function of any safety- related systems. 	<ol style="list-style-type: none"> 1. Safety-grade isolation devices required between this system and existing safety-related system. 2. A malfunction of this non-safety-related system should not affect the design safety function of any safety-related systems. 	A malfunction of this instru- mentation and monitoring system should not affect the design safety function of any safety-related instrumentation and monitoring systems powered by onsite or offsite ac power buses.
Seismic Qualification	Not required.	Not required.	Not required.
Environmental Consideration	Needed for station blackout event only and not for DBA conditions if normal cooling is lost. See Regulatory Position 3.2.4. Procedures should be in place to effect the actions necessary to maintain accept- able environmental conditions for the required equipment.	Needed for station blackout event only and not for DBA conditions if normal cooling is lost. See Regulatory Position 3.2.4. Procedures should be in place to effect the actions necessary to maintain accept- able environmental conditions for the required equipment.	Needed for station blackout event only and not for DBA conditions if normal cooling is lost. See Regulatory Position 3.2.4. Procedures should be in place to effect the actions necessary to maintain accept- able environmental conditions for the required equipment.
Capacity	Sufficient RCS makeup so that core temperatures are maintained at acceptably low values con- sidering a loss of RCP water inventory through a postulated RCP seal failure during the specified duration of station blackout, with a minimum assumed RCP seal leakage of 20 gpm per RCP, unless a lower value is justified.	Provide sufficient capacity for decay heat removal. During the specified duration of station blackout, the isolation condenser pool side requires a water makeup system powered by sources inde- pendent from onsite and offsite ac buses.	Provide sufficient instrumenta- tion and control room indica- tions for parameters required for verification of RCS natural circulation during the specified duration of station blackout.
Quality Assurance	As indicated in Regulatory Position 3.5.	As indicated in Regulatory Position 3.5.	As indicated in Regulatory Position 3.5.

APPENDIX B (Continued)

	RCS Makeup System (PWRs and BWRs Without RCIC)	Isolation Condenser (BWRs Without RCIC)	Instrumentation and Control Room Indications for Verification of RCS Natural Circulation (PWRs and BWRs Without RCIC)
Technical Specifications for Maintenance, Surveillance, Limiting Condition, FSAR, etc.	Should be consistent with the Interim Commission Policy Statement on Technical Specifications (Federal Register Notice 52 FR 3789) as applicable.	Should be consistent with the Interim Commission Policy Statement on Technical Specifications (Federal Register Notice 52 FR 3789) as applicable.	Should be consistent with the Interim Commission Policy Statement on Technical Specifications (Federal Register Notice 52 FR 3789) as applicable.
Instrumentation and Monitoring	Must meet system functional requirements.	Must meet system functional requirements.	—
Single Failure	Not required.	Not required.	Not required.
Common Cause Failure (CCF)	Design should, to the extent practicable, minimize CCF between safety-related and non-safety-related systems.	Design should, to the extent practicable, minimize CCF between safety-related and non-safety-related systems.	Design should, to the extent practicable, minimize CCF between safety-related and non-safety-related systems.

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REGULATORY ANALYSIS

A separate regulatory analysis was not prepared for this regulatory guide. The regulatory analysis prepared for the station blackout rule, NUREG-1109, "Regulatory/Backfit Analysis for the Resolution of Unresolved Safety Issue A-44, Station Blackout," provides the regulatory basis for this guide and examines the costs and benefits of the rule as implemented by the guide. A copy of NUREG-1109 is

available for inspection and copying for a fee at the NRC Public Document Room, 1717 H Street NW., Washington, DC 20555. Copies of NUREG-1109 may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Post Office Box 37082, Washington, DC 20013-7082; or from the National Technical Information Service, Springfield, VA 22161.

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