Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 6:34 PM
To: Breskovic, Clarence
Subject: NHK news reports TEPCO started to release air from Fukushima 1 reactor

This will be my last report for the time being as the regular media outlets seem to be on top of things. If you get NHK TV (Japan Broadcasting Corp.) on your cable TV service I recommend watching it.

Thanks,
Clarence

3/1

Satorius, Mark

From: OPA Resource
Sent: Friday, March 11, 2011 3:26 PM
To: Ash, Darren; Barkley, Richard; Batkin, Joshua; Bell, Hubert; Belmore, Nancy; Bergman, Thomas; Bollwerk, Paul; Bonaccorso, Amy; Borchardt, Bill; Bozin, Sunny; Brenner, Eliot; Brock, Terry; Brown, Boris; Bubar, Patrice; Burnell, Scott; Burns, Stephen; Carpenter, Cynthia; Chandrathil, Prema; Clark, Theresa; Collins, Elmo; Couret, Ivonne; Crawford, Carrie; Cutler, Iris; Dacus, Eugene; Dapas, Marc; Davis, Roger; Dean, Bill; Decker, David; Dricks, Victor; Droggitis, Spiros; Flory, Shirley; Franovich, Mike; Gibbs, Catina; Haney, Catherine; Hannah, Roger; Harbuck, Craig; Harrington, Holly; Hasan, Nasreen; Hayden, Elizabeth; Holahan, Gary; Holahan, Patricia; Holian, Brian; Jacobssen, Patricia; Jaczko, Gregory; Jasinski, Robert; Jenkins, Verlyn; Johnson, Michael; Jones, Andrea; Kock, Andrea; Kotzalas, Margie; Ledford, Joey; Lee, Samson; Leeds, Eric; Lepre, Janet; Lew, David; Lewis, Antoinette; Loyd, Susan; Magwood, William; McCrary, Cheryl; McGrady-Finneran, Patricia; McIntyre, David; Mensah, Tanya; Mitlyng, Viktoria; Monninger, John; Montes, David; Nieh, Ho; Ordaz, Vonna; Ostendorff, William; Owen, Lucy; Powell, Amy; Quesenberry, Jeannette; Reddick, Darani; Regan, Christopher; Reyes, Luis; Riddick, Nicole; RidsSecyMailCenter Resource; Riley (OCA), Timothy; Rohrer, Shirley; Samuel, Olive; Satorius, Mark; Schaaf, Robert; Schmidt, Rebecca; Scott, Catherine; Screnci, Diane; Shaffer, Vered; Shane, Raeann; Sharkey, Jeffry; Sheehan, Neil; Sheron, Brian; Siurano-Perez, Osiris; Steger (Tucci), Christine; Svinicki, Kristine; Tabatabai, Omid; Tannenbaum, Anita; Taylor, Renee; Temp, WDM; Thomas, Ann; Uhle, Jennifer; Uselding, Lara; Vietti-Cook, Annette; Virgilio, Martin; Virgilio, Rosetta; Walker-Smith, Antoinette; Weaver, Doug; Weber, Michael; Weil, Jenny; Werner, Greg; Wiggins, Jim; Williams, Evelyn; Zimmerman, Roy; Zorn, Jason
Subject: Press Release: NRC Continues to Track Earthquake and Tsunami Issues
Attachments: 11-043.docx

The attached to be issued and posted in approximately 15 minutes.

Office of Public Affairs
US Nuclear Regulatory Commission
301-415-8200
opa.resource@nrc.gov

w/2

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 12:27 PM
To: Breskovic, Clarence
Subject: Secretary Clinton video on supplying "coolant" to Japan

http://www.state.gov/video/?videoid=822755222001

w/3

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 12:14 PM
To: Breskovic, Clarence
Subject: Radiation Level Rising in Fukushima Nuclear Plant Turbine Building - emergency generators dispatched

Radiation Level Rising in Fukushima Nuclear Plant Turbine Building

Fukushima, Japan, March 12 Kyodo -- The radiation level is rising in the building housing a turbine of the No. 1 reactor of the Fukushima No. 1 nuclear power plant following Friday's powerful earthquake, the operator Tokyo Electric Power Co. said Saturday.

The company also said monitoring data suggested the air pressure level has also soared inside the container of the reactor.

State of Emergency Declared at Fukushima Plant

Tokyo *Asahi Shimbun Online* 1733 GMT 11 Mar 11
Friday's devastating earthquake in the Tohoku region may have created a dangerous situation at two nuclear reactors in Fukushima Prefecture.

Officials of the Nuclear and Industrial Safety Agency were informed by Tokyo Electric Power Co. that the emergency core cooling system was not working at two reactors.

In addition, another mechanism that had been used to send water to the core also stopped at 8:30 p.m.

If the cores are not sufficiently cooled, there is a danger of a possible core meltdown.

At a news conference Friday night, Chief Cabinet Secretary Yukio Edano said a state of emergency at a nuclear facility was declared at 4:36 p.m.

It is the first time such a state of emergency has been declared.

According to NISA officials, although the reactor core stopped operations after the earthquake hit, water had to be inserted to the core to cool it because heat continued to be emitted from the nuclear fuel.

Although workers had to initiate emergency core cooling system procedures, the lack of an external power source and the failure of an emergency generator crippled the system that circulates water to the core to cool it.

TEPCO officials dispatched 51 generator vehicles to the reactors in an attempt to restore power. One vehicle reached one of the nuclear reactors late Friday and some of that reactor's power was restored.

At 9:23 p.m., the central government issued an evacuation instruction for residents living within a 3-kilometer radius of the No. 1 Fukushima nuclear power plant as well as an instruction to residents living within a radius of between 3 and 10 kilometers to remain indoors.

Edano said no radiation leakage had been detected.

W/4

The company issued an emergency evacuation order for the two reactors at the No. 1 Fukushima nuclear power plant. Officials from local communities gathered at a special monitoring facility in Okuma to oversee the cooling of the cores.

There was also the possibility that seawater pumps for cooling purposes may have stopped at two reactors at the No. 2 Fukushima nuclear power plant.

If those pumps remain inoperational, it could affect the emergency core cooling systems at those reactors as well.

Release

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 11:26 AM
To: Breskovic, Clarence
Subject: Japan Update: Water levels at Fukushima; Onagawa fire extinguished

Update9: 3,000 Ordered To Evacuate Near Quake-hit Fukushima Nuclear Plant

Tokyo, March 12 Kyodo -- (EDS: ADDING FIRE EXTINGUISHED AT ONAGAWA PLANT) Japan declared a state of atomic power emergency Friday after the country, which has about 50 nuclear power reactors, was hit by a magnitude 8.8 earthquake, instructing around 3,000 residents near the Fukushima No. 1 plant to evacuate.

Top government spokesman Yukio Edano told an evening press conference, "We have a situation where one of the reactors (of the plant) cannot be cooled down." But the chief Cabinet secretary said the evacuation instruction was only precautionary.

Edano said, "No radiation has leaked outside the reactor. The incident poses no danger to the environment at the moment." He also said early Saturday in Tokyo the incident was under control.

The post-quake situation prompted the Vienna-based International Atomic Energy Agency to scramble for details from contacts in Japan's industry ministry, while saying in a statement that at least four nuclear power plants "closest to the quake have been safely shut down" after the 2:46 p.m. quake.

Tokyo Electric Power Co., the operator of the Fukushima plant, reported that the water level around fuel rods was falling in the reactor. Radioactive materials could be emitted if part of a fuel rod is exposed to the air.

But officials of the prefectural government dismissed the view that the plant is in a critical situation, saying the top of the water is 3.4 meters above the fuel rods at the troubled No. 2 reactor.

The evacuation advisory was issued for people living within a 3-kilometer radius of the plant, while those living within a 10-kilometer radius were asked to stay home, Edano said.

Prime Minister Naoto Kan declared the emergency, the first in the quake-prone country, so that authorities can easily implement emergency relief measures, Edano said. Defense Minister Toshimi Kitazawa ordered the Self-Defense Forces to act in response to the declaration.

The Defense Ministry dispatched a chemical corps of the Ground Self-Defense Force to the plant and Motohisa Ikeda, senior vice industry minister, also left for Fukushima by an SDF helicopter.

According to the industry ministry, a total of 11 nuclear reactors automatically shut down at the Onagawa plant, the Fukushima No. 1 and No. 2 plants and the Tokai No. 2 plant after the strongest recorded earthquake in the country's history.

A fire started at a building housing the turbine of the Onagawa plant in Miyagi at 3:30 p.m. but was put out before 11 p.m., the operator, Tohoku Electric Power Co., said, denying it had detected any signs of radiation leaks.

Water spilled from pools containing fuel rods at the Kashiwazaki-Kariwa plant on the Sea of Japan coast in Niigata Prefecture and the Onagawa plant, the operators said, saying they saw no signs suggesting radiation leaks.

W/S

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 11:02 AM
To: Breskovic, Clarence
Subject: U.S. delivers coolant to Japan nuclear plant: Clinton/ Plant Being Cooled

WASHINGTON | Fri Mar 11, 2011 11:05am EST
WASHINGTON (Reuters) - The United States has transported coolant to a Japanese nuclear plant affected by a massive earthquake and will continue to assist Japan, Secretary of State Hillary Clinton said on Friday.
"We just had our Air Force assets in Japan transport some really important coolant to one of the nuclear plants," Clinton said at a meeting of the President's Export Council.
"You know Japan is very reliant on nuclear power and they have very high engineering standards but one of their plants came under a lot of stress with the earthquake and didn't have enough coolant," Clinton said.

Japan Reactor Being Cooled

LONDON, March 11 (Reuters) - The World Nuclear Association, the main nuclear industry body, said on Friday that it understood the situation at Japan's Fukushima plant after a massive earthquake was under control, and water was being pumped into its cooling system.
"We understand this situation is under control," an analyst at the association told Reuters.
The Japanese government had declared an emergency situation around the plant as a precaution and evacuated residents, saying a cooling system was not working.
The analyst said he understood that a back-up battery power system had been brought online after about an hour, and begun pumping water back into the cooling system, where the water level had been falling.

Release

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 10:38 AM
To: Breskovic, Clarence
Subject: Japan Update: Evcuations ordered around Fukishima

Contents

Japan Orders Evacuation of Residents Near N-plant

Tokyo, March 11 (Jiji Press) -- The government on Friday ordered evacuation of residents in a 3-kilometer radius from a quake-hit Tokyo Electric Power Co. nuclear power plant in Fukushima Prefecture, northern Japan, citing a possible radiation leak.

The government, however, has confirmed no radiation leak so far. The evacuation order was issued after the 8.8-magnitude quake hit northern Japan to have all the three reactors at the power plant shut down automatically.

Chief Cabinet Secretary Yukio Edano said at a news conference that the government called for preemptive evacuation, urging the 5,862 residents to stay calm in following the order.

The government also instructed 45,345 residents living outside the area but in a 10-kilometer radius to stay at home.

According to the Nuclear and Industrial Safety Agency of the Ministry of Economy, Trade and Industry, cooling functions of the No. 2 reactor at the plant have stopped working, affected by a power outage caused by the quake.

The agency is unable to confirm cooling water levels at the reactor and the No.1 reactor. The plant's emergency diesel power generation equipment has stopped working, leading the company to dispatch power supply cars, according to the agency.

As the power supply cars have reached the plant, the company is proceeding with work to resupply electricity to restore cooling functions.

The Fukushima prefectural government has reported that cooling water levels at the No.2 reactor are dropping and warned that continued decline would expose nuclear fuel rods to air to generate radiation.

Reactors were also automatically shut down at the company's Fukushima No. 2 nuclear power station, with emergency supply of cooling water starting at one of them.

w/7

The nuclear safety agency said sufficient cooling water is supplied at the reactor, but tsunami prevented the agency from confirming whether pumps taking in sea water for two other reactors are working properly.

Kyodo: Gsdf Sent To Area Near Fukushima Nuke Plant To Assist Evacuation

Tokyo, March 12 Kyodo -- A total of around 160 Ground Self-Defense Force personnel and a number of large vehicles have been dispatched to an area near the Fukushima No. 1 nuclear plant in Fukushima Prefecture to help evacuate local residents, a senior SDF officer said late Friday.

More than 100 members of a GSDF special unit trained to deal with chemical disasters have been advancing toward the area, SDF chief Ryoichi Oriki said at a news conference at the Defense Ministry.

Some 3,000 residents near the nuclear plant have been ordered to evacuate due to a problem with a cooling system detected at one of the six reactors at the Tokyo Electric Power Co. plant.

Meanwhile, liaison officers from U.S. Forces Japan were being sent to the ministry to coordinate the disaster response of the SDF and U.S. forces, he added.

Around 300 aircraft and about 40 vessels of the SDF have been dispatched or are being prepared for dispatch to deal with the disaster, according to the ministry.

3,000 Ordered To Evacuate Near Quake-hit Fukushima Nuclear Plant

Tokyo, March 11 Kyodo -- (EDS: ADDING GOV'T SPOKESMAN'S COMMENTS) Japan declared a state of atomic power emergency Friday after the country, which has about 50 nuclear power reactors, was hit by a powerful earthquake, instructing around 3,000 residents near the Fukushima No. 1 plant to evacuate.

Japan's top government spokesman Yukio Edano told an evening press conference, "We have a situation where one of the reactors (of the plant) cannot be cooled down." But the chief Cabinet secretary said the evacuation instruction was only precautionary.

"No radiation has leaked outside the reactor. The incident poses no danger to the environment at the moment," Edano said.

The post-quake situation prompted the Vienna-based International Atomic Energy Agency to scramble for details from contacts with Japan's industry ministry, while saying in a statement that at least four nuclear power plants "closest to the quake have been safely shut down" after the 2:46 p.m. quake.

Tokyo Electric Power Co., the operator of the Fukushima plant, reported that the level of the water surrounding the fuel rods was going down in the reactor.

Radioactive materials could be emitted if part of a rod is exposed to the air.

But officials of the prefectural government dismissed a view that the plant is in any critical situation, saying the top of the water is 3.4 meters above the fuel rods at the troubled No. 2 reactor.

The evacuation advisory was issued for people living within a 3-kilometer radius of the plant, while those living within a 10-kilometer radius were asked to stay home, Edano said.

Prime Minister Naoto Kan declared the emergency even though no radiation leak has been detected after the magnitude 8.8 quake so that authorities can easily implement emergency relief measures, Edano said.

Japanese Defense Minister Toshimi Kitazawa ordered the Self-Defense Forces to act in response to the state of atomic power emergency. Also, the Defense Ministry dispatched a chemical corps of the Ground Self-Defense Force to the plant.

Motohisa Ikeda, senior vice industry minister, also left Tokyo for Fukushima on Friday evening by an SDF helicopter.

According to the industry ministry, a total of 11 nuclear reactors were automatically shut down at the Onagawa plant, Fukushima No. 1 and No. 2 plants and Tokai No. 2 plant after the biggest-magnitude quake in the country's modern history.

At the Onagawa plant in Miyagi Prefecture, a fire started at a building housing the turbine, the operator, Tohoku Electric Power Co., said, denying it detected any signs of radiation leaks.

Water spilled from pools containing fuel rods at the Kashiwazaki-Kariwa plant on the Sea of Japan coast in Niigata Prefecture and the Onagawa plant, the operators said, saying they saw no signs suggesting radiation leaks.

Hokkaido Electric Power Co. reported no problems at its Tomari No. 1, No. 2 and No. 3 plants on the northernmost main island.

There were no immediate signs of any problems at the Hamaoka nuclear plant on the Pacific coast in Shizuoka Prefecture, southwest of Tokyo, the prefectural government said.

Fukushima Pref. Warns of Radiation Leak at N-plant

Fukushima, March 11 (Jiji Press) -- The Fukushima prefectural government on Friday warned that water levels dropped at a reactor of a quake-hit Tokyo Electric Power Co. <9501> nuclear power plant, posing a threat of a radiation leak.

If the water levels at the No.2 reactor at the Fukushima No. 1 nuclear power station of the company keep falling, nuclear fuel rods would be exposed to air to generate radiation, according to the prefecture.

The prefecture urged residents in a 2-kilometer radius from the reactor to immediately evacuate.

Satorius, Mark

From:	Satorius, Mark
Sent:	Friday, March 11, 2011 7:17 AM
To:	Pederson, Cynthia; Boland, Anne; Louden, Patrick; West, Steven; Shear, Gary; Reynolds, Steven; OBrien, Kenneth; Holt, BJ; Sotiropoulos, Dina
Subject:	Fw: Japan's Tepco shuts seven nuclear units after earthquake

Lots of news flashing around on this. This message give the most succinct description I've seen.
Mark Satorius

From: Breskovic, Clarence
To: Breskovic, Clarence
Sent: Fri Mar 11 06:33:31 2011
Subject: Japan's Tepco shuts seven nuclear units after earthquake

This is an older message but gives a more complete picture of the reactor situation when the earthquake hit.

Japan's Tepco shuts seven nuclear units after earthquake
Singapore (Platts)--11Mar2011/555 am EST/1055 GMT

Japan's Tokyo Electric Power Company has shut a total of seven nuclear units at two of its nuclear power plants in Fukushima prefecture after a 8.9-magnitude earthquake struck northeastern Japan off the main Honshu island Friday, a company spokesman said.

At its 4.4 GW Fukushima Daini plant, units 1, 2 and 3 (460 MW, 784 MW and 784 MW respectively) were operating during the earthquake and have all been shut, the spokesman said.

Units 4, 5 and 6 (784 MW, 784 MW and 1.1 GW respectively) were all offline for maintenance.

At the Fukushima Daiichi plant, all four 1.1 GW units were running during the earthquake and were subsequently stopped, he added.

At Tepco's Kashiwazaki-Kariwa nuclear plant in the northwest, units 2, 3 and 4 were already offline for inspections, while units 1, 5, 6 and 7 were operating during the earthquake and are still operating, the spokesman said.

Tepco released a statement at 1630 Tokyo time (0730 GMT) confirming the outages, and adding: "At all the nuclear power stations, monitoring posts, which monitor radiation through exhaust stacks have shown normal values. In other words, at the present, no radiation leaks have been confirmed."

The company said that 4.05 million households had lost power as a result of the earthquake.

The earthquake struck at a depth of 10 km, off Sanriku in Miyagi prefecture at around 2:46 pm (0546 GMT), the Japan Meteorological Agency said.

The agency also issued a tsunami warning for Honshu's Pacific coast, warning of waves up to 3 meters high.

R2

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 5:34 AM
To: Breskovic, Clarence
Subject: Japan's Tepco shuts seven nuclear units after earthquake

This is an older message but gives a more complete picture of the reactor situation when the earthquake hit.

Japan's Tepco shuts seven nuclear units after earthquake
Singapore (Platts)--11Mar2011/555 am EST/1055 GMT

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The agency also issued a tsunami warning for Honshu's Pacific coast, warning of waves up to 3 meters high.

w/9

Lee

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 5:40 AM
To: Breskovic, Clarence
Subject: Japan initiates emergency protocol after earthquake

Japan initiates emergency protocol after earthquake

11 March 2011

Nuclear Engineering International

Onagawa, Fukushima Daiichi, Fukushima Daini and Tokai nuclear power stations have automatically shut down following a magnitude 8.8 earthquake off the northeast coast of the largest island of Japan, Honshu.

All four operating plants on that coast have automatically shut down, or SCRAMmed, according to Japan Atomic Information Forum (JAIF). Higashidori 1, which is also located on Honshu's northeast coast, was shut down for a periodic inspection.

The earthquake struck at 2:45pm local time. A 6:45 pm local time report from the Japan Nuclear and Industrial Safety Agency contained more information of damage and other problems in a site-by-site report.

-A C02 fire has broken out at Onagawa nuclear power station.

-Utility TEPCO has requested the establishment of a nuclear emergency response programme for Fukushima Daiichi 1&3 and Fukushima Daini 1.

JAIF reported that Fukushima Daiichi 1, 2 and 3 automatically shut down; units 4, 5 and 6 were in maintenance outages. Fukushima Daini 1, 2, 3 and 4 automatically shut down.

JAIF has reported that TEPCO sent the emergency report because emergency diesel generators at the two sites are out of order. It said that there is no report that the radiation was detected out of the site. It said that an emergency headquarters has been set up and will issue information hourly.

JAIF also reported that the Rokkasho reprocessing facility was being powered by emergency diesel generators. No other unusual events or radiation leaks have been reported. Nuclear power stations at Hamaoka, Kashiwazaki-Kariwa and Tomari are continuing normal operation, according to JAIF.

After an accident occurs at a nuclear power plant, the licensee must notify the national Nuclear and Industrial Safety Agency by law.

A minister in its controlling organisation, the Ministry of Economy, Trade and Industry, notifies the prime minister's office. The central nuclear emergency response headquarters (NERHQ) of the national government issues a nuclear emergency declaration, which also includes instructions about preventative measures. It receives technical advice from the Nuclear Safety Commission. The NERHQ sends a specialist and the NSC sends a commissioner to the site.

After the emergency declaration is received, the local office of the national government's NERHQ arranges prevention measures based on factors including facility information, climate and monitoring.

3/10

Nuclear emergency response operations are coordinated in one of 20 so-called off-site centres spread across Japan, which are close to, but not inside, nuclear facilities. The off-site centre's role is to be the main centre of information, incident analysis, and emergency plan organisation and direction. Two or three senior specialists for nuclear emergency preparedness work in each OFC. In normal conditions, the specialists work as nuclear power safety inspectors, checking plant operation from the viewpoint of regulation. During an emergency, the specialists organize prevention measures as a secretariat and report it to a joint council for nuclear emergency response. The joint council includes not only the local office of the national government's NERHQ and the senior specialists, but also representatives of the Nuclear Safety Commission and prefectural and municipal NERHQs.

The joint council devises instructions to residents for evacuation and/or sheltering. It also instructs the emergency services and coast guard, self-defence force, Japan Nuclear Energy Safety Organisation (JNES), the National Institute of Radiological Sciences, the Japan Atomic Energy Agency, and other bodies.

JNES has constructed a dedicated high-speed network system connecting the 20 off-site centres and other agencies called Emergency Preparedness Response Network (EPRNet). It includes video conferencing systems, e-mail, telephone, fax, and connections to a meteorological information service, a plant information collection, diagnosis, prognosis and analytical prediction tool (called ERSS), and an emergency environmental dose prediction tool (called SPEEDI).

R2

5 24

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 5:13 AM
To: Breskovic, Clarence
Subject: Japan Update: Emergency Cooling System Working at Quake-hit Fukushima Plant

Emergency Cooling System Working at Quake-hit Fukushima Plant

Tokyo *Kyodo World Service* 1047 GMT 11 Mar 11
Tokyo, March 11 Kyodo -- An emergency cooling system was activated at the No. 1 reactor of the Fukushima No. 2 nuclear plant after a powerful earthquake hit northern Japan on Friday, the industry ministry said.

The operator, Tokyo Electric Power Co., notified the ministry of the move, the ministry said, adding monitors outside the facility have detected no abnormalities.

3/11

Rel

532

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 5:11 AM
To: Breskovic, Clarence
Subject: Japan: Fukushima 1 & 2 cooling system problems

According to NHK TV news (Japan Broadcasting Corporation) the Fukishima 1 & 2 reactors are experiencing reactor cooling problems after diesel generator failures but also saying there is no cause for alarm even though the government has declared a "nuclear emergency situation".

3/12

Rel 524

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 4:31 AM
To: Breskovic, Clarence
Subject: Japan: media reports government has decided to declare a nuclear power emergency situation

Fire at Tohoku Elec Onagawa nuclear plant

TOKYO, March 11 (Reuters) - A fire broke out at Tohoku Electric Power Co's Onagawa nuclear plant in northeastern Japan following Friday's major earthquake, Kyodo news agency said.

Prior to the Kyodo report, the company had said it had not received information on whether there had been any problems at the nuclear power plant after the disaster.

Separately, Fukushima Prefecture, the site of a Tokyo Electric Power nuclear power plant, said on Friday the plant's reactor cooling system was functioning, denying an earlier report that it was malfunctioning.

Japanese media reported that the government had decided to declare a nuclear power emergency situation, which occurs if there is confirmation of radioactivity leaks from a nuclear power plant or a reactor cooling system breaks down.

w/13

Rel

526

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 3:34 AM
To: Breskovic, Clarence
Subject: Japan: Fukushima diesel generator failure

Devastating earthquake hits Japan
Financial Times
By Jonathan Soble in Tokyo, Rahul Jacob in Hong Kong and agencies
Published: March 11 2011 06:30 | Last updated: March 11 2011 08:15

Japan was reeling Friday after an 8.9 magnitude earthquake hit the northeast of the country, causing many injuries, fires and a 12m tsunami along parts of the country's coastline.
Japan was braced for further tsunamis to hit in the coming hours. Its Pacific coast was badly affected and the country was bracing for waves at least 20 foot high. The country's northern region was expecting a significant number of casualties and a tsunami warning was issued by several countries including Russia, Indonesia, Mexico and Taiwan.
"People in Japan should exercise the spirit of solidarity and act fast," said Japan's prime minister Naoto Kan appealing for calm, "we ask you to act in such a way to minimise the damage."

In Sendai, the closest large city to the quake's epicentre, oil storage tanks caught fire and the tsunami flooded the airport, sending staff and passengers onto the roof. Outside the city, television helicopters captured a vast moving blanket of water, mud, debris, cars and unmoored houses -- some of them on fire -- spreading across rice fields.
Residents of several Sendai districts and smaller cities and towns in Miyagi and neighbouring Aomori were ordered to leave their homes.
The governor of Miyagi prefecture, where Sendai is located, asked for Self Defence Forces soldiers to be deployed to assist rescue efforts.
The quake was strongly felt in Tokyo, where there were isolated reports of mostly superficial damage. Thousands of people milled in parks and squares in the city's skyscraper districts after fleeing tall buildings. Transport systems were brought to a standstill and mobile phone service failed – though many people managed to communicate using the city's numerous public wireless internet points.
In the two hours following the earthquake, there were 12 significant aftershocks of at least 5.9 magnitude, which continued to shake buildings and cause damage. The most severe of these measured 7.1.
Precise numbers of dead and injured were not immediately available. NHK relayed sporadic reports of casualties, including more than a dozen elderly people believed to be trapped under the collapsed roof of a nursing home in northern Japan. About five people are reported dead in that incident.
"The building shook for what seemed a long time and many people in the newsroom grabbed their helmets and some got under their desks," Reuters correspondent Linda Sieg said in Tokyo.
"It was probably the worst I have felt since I came to Japan more than 20 years ago."
In crowded central Tokyo in areas such as Shinjuku and Marunouchi, thousands of people rushed out of skyscrapers into parks and squares.
The Japanese utility Hokuriku Electric Company said that all three of its nuclear reactors at its Onagawa plant in northern Japan had shut down automatically. NHK showed ceiling panels inside Ibaraki airport, Japan's newest regional airport north of Tokyo, collapsing during the quake.
Tokyo Electric Power (Tepco) reported that 4.5m homes lost power in the capital area, and many northern districts were without electricity entirely. A nuclear plant in Fukushima prefecture operated by Tepco shut down automatically, but at least one diesel generator needed to cool its reactors failed, though Tepco said safety had not been compromised.
Tokyo Stock Exchange headquarters were rocked by the quake but its trading system kept functioning. The Nikkei 225 closed down 1.7 per cent at 10,254.43. The yen dropped to a two week low against the dollar.
Equity markets across the region sold off. Hong Kong's Hang Seng fell 1.5 per cent while Sydney's S&P ASX 200 fell 1.2 per cent.
Public broadcaster NHK showed flames and black smoke billowing from a building in Odaiba, a Tokyo suburb, and bullet trains to the north of the country were halted, Reuters reports.
Black smoke was also pouring out of an industrial area in Yokohama's Isogo area. TV footage showed boats, cars and trucks floating in water after a tsunami hit the town of Kamaichi in northern Japan. An overpass, location unknown, appeared to have collapsed into the water.

3/14

Kyodo news agency said there were reports of fires in the city of Sendai in the northeast.
Passengers on a subway line in Tokyo screamed and grabbed other passengers' hands. The shaking was so bad it was hard to stand, said Reuters reporter Mariko Katsumura.
Earthquakes are common in Japan, one of the world's most seismically active areas. The country accounts for about 20 per cent of the world's earthquakes of magnitude 6 or greater.

Rec

527

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 3:06 AM
To: Breskovic, Clarence
Subject: Japan: No Radiation Leaks Or Abnormalities - 11 reactors shut down

No Radiation Leaks Or Abnormalities in Quake-hit Japan: Prime Minister Kan

Tokyo, March 11 Kyodo -- (EDS: RECASTING) Japan has detected no abnormalities such as radiation leakage at nuclear power plants in the country, Prime Minister Naoto Kan said Friday, following a powerful earthquake and aftershocks that hit a wide area on the Pacific coast of the northeastern region.

A total of 11 nuclear reactors were automatically shut down at the Onagawa plant, Fukushima No. 1 and No. 2 plants and Tokai No. 2 plant, the industry ministry said, adding there were no immediate reports from monitoring posts of fires or other abnormalities near the nuclear plants after the 2:46 p.m. quake.

Kan told a press conference, "Parts of nuclear plants were automatically shut down but we haven't confirmed any effects induced by radioactive materials outside the facilities." Tokyo Electric Power Co., which operates the Fukushima plants, said it kept operating the Kashiwazaki-Kariwa nuclear plant on the Sea of Japan coast in Niigata Prefecture, while Hokkaido Electric Power Co. reported no problems at its Tomari No. 1, No. 2 and No. 3 plants on the northernmost main island.

There were no immediate signs of any problems at the Hamaoka nuclear plant on the Pacific coast in Shizuoka Prefecture, southwest of Tokyo, the prefectural government said.

3/15

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 2:38 AM
To: Breskovic, Clarence
Subject: Japan earthquake/tsunami - more reactors shut down

Powerful Quake Hits Northeastern Japan

Tokyo, March 11 (Jiji Press) -- An extremely powerful earthquake hit the northeastern Japan region of Tohoku at 2:46 p.m. Friday (5:46 a.m. GMT).

The quake, which also rocked a wide range of areas including Tokyo, eastern Japan, measured 7, the upper limit of the Japanese seismic intensity scale, in northern Miyagi Prefecture in the Tohoku region. Its magnitude was estimated at 7.9, the Meteorological Agency said.

The agency issued a heightened tsunami alert to residents in the prefectures of Iwate, Miyagi and Fukushima along the Pacific coast.

A tsunami with an estimated height of more than 10 meters reached the shore of Miyagi Prefecture, the agency said.

The focus of the quake is located off Miyagi Prefecture and is 10 kilometers deep.

Tohoku Electric Power Co. halted its Onagawa nuclear power plant, according to the industry ministry's Nuclear and Industrial Safety Agency.

Tokyo Electric Power Co. officials said the No. 1 to No. 3 reactors of its first Fukushima nuclear plant was shut down automatically.

Operations of the firm's second Fukushima plant's No. 1 to No. 4 reactors were also suspended.

Japan Atomic Power Co. halted its Tokai nuclear power plant in Ibaraki Prefecture.

According to Miyagi police, many portions of the Tohoku Expressway were damaged.

The Tokyo Fire Department reported several injuries in central Tokyo and fires in 10 places including Daiba and Ikebukuro.

Tohoku Electric said power outage affects all areas in Aomori, Akita and Iwate Prefectures and almost all areas in Yamagata and Miyagi Prefectures.

pel

530

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 2:29 AM
To: Breskovic, Clarence
Subject: Japan earthquake: Government Says No radioactive leaks at Tohoku nuke plants

Govt: No radioactive leaks at Tohoku nuke plants
The government's Nuclear and Industrial Safety Agency says no abnormal levels of radiation have been reported at four nuclear power plants in the quake-hit Tohoku region.

Power companies have suspended the operation of the plants and are checking their safety.
NHK News, Friday, March 11, 2011 15:34 +0900 (JST)

3/17

R2 531

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 1:50 AM
To: Breskovic, Clarence
Subject: Japan: Onagawa map and details

http://world-nuclear.org/NuclearDatabase/reactordetails.aspx?id=27570&rid=CA833697-1FFF-4CBB-B729-74C88B99295B

W/18

Rec

530

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 1:44 AM
To: Breskovic, Clarence
Subject: Japan: Onagawa and Fukushima plants shut down

Nuclear Plants Shut Down in Miyagi, Fukushima
Tokyo *Kyodo World Service* 0707 GMT 11 Mar 11
Tokyo, March 11 Kyodo -- (EDS: ADDING INDUSTRY MINISTRY INFO, INFO ON HOKKAIDO, FIXING OPERATOR) Nuclear plants on the Pacific coast in Miyagi and Fukushima prefectures have been automatically shut down Friday following a powerful earthquake that hit a wide area in northeastern Japan, the operators said.

There were no immediate reports from monitoring posts of fires or other abnormalities near the nuclear plants after the 2:46 p.m. quake, the industry ministry said.

The suspended power plants were the Onagawa plant in Miyagi Prefecture, operated by Tohoku Electric Power Co., and the Fukushima No. 1 and No. 2 plants in the adjacent Fukushima Prefecture, run by Tokyo Electric Power Co., according to the companies.

Tokyo Electric also said it kept operating the Kashiwazaki-Kariwa nuclear plant on the Sea of Japan coast in Niigata Prefecture, while Hokkaido Electric Power Co. reported no problems at its Tomari No. 1, No. 2 and No. 3 plants in the northernmost main island.

There were no immediate signs of any problems at the Hamaoka nuclear plant on the Pacific coast in Shizuoka Prefecture, southwest of Tokyo, the prefectural government said.

More USGS data:

Magnitude 7.1 - OFF THE EAST COAST OF HONSHU, JAPAN

2011 March 11 06:25:50 UTC

http://earthquake.usgs.gov/earthquakes/recenteqsww/Quakes/usc0001xig.php#details

W/19

Satorius, Mark

From:	Breskovic, Clarence
Sent:	Friday, March 11, 2011 1:37 AM
To:	Breskovic, Clarence
Subject:	Powerful quake rocks northern Japan - Onagawa reactor automatically shuts down

Friday, March 11, 2011

Powerful quake rocks northern Japan

Kyodo News
A powerful earthquake with a magnitude of 7.9 rocked northeastern Japan on Friday, measuring the highest level intensity of 7 on the Japanese seismic scale, in Miyagi Prefecture, the Japan Meteorological Agency said.
Local police said many people were injured in the 2:46 p.m. quake, with reports of fires coming not only from the prefectural capital of Sendai but also from Tokyo, some 300 kilometers from Sendai, where a prolonged and powerful temblor was also felt.
The Metropolitan Police Department said many people were injured when part of the Kudan Kaikan hall in Chiyoda Ward in central Tokyo collapsed.
The agency issued a rare warning of huge tsunami for the Pacific coastal region including Iwate Prefecture. Public broadcaster NHK said a large number of cars were washed away into the sea when a tsunami hit the Kamaishi port in Iwate Prefecture.
In Kyodo News' Sendai office, part of the ceiling collapsed and bookshelves and office equipment toppled over.
Fires occurred across a wide area, including at an ironworks in Chiba Prefecture.
Onagawa nuclear power plant in Miyagi Prefecture automatically halted operations following the quake. Its operator, Tohoku Electric Power Co., was checking whether any damage was caused.
A major blackout occurred across a wide area of northeastern Japan.
The quake affected the nation's key transportation systems, including Narita airport, which shut its runways for safety checks.

USGS earthquake map:

http://earthquake.usgs.gov/earthquakes/recenteqsww/Maps/10/140_35.php

http://earthquake.usgs.gov/earthquakes/recenteqsww/Quakes/usc0001xka.php#details

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From: Breskovic, Clarence
Sent: Friday, March 11, 2011 6:28 PM
To: Breskovic, Clarence
Subject: Tokyo Electric Power To Release Reactor Pressure

Tokyo Electric Power To Release Reactor Pressure

Tokyo, March 12 (Jiji Press) -- Tokyo Electric Power Co. has decided to release the pressure from reactors of a quake-hit nuclear power plant in Fukushima Prefecture, northern Japan, to prevent them from breaking down, company sources said Saturday.

Releasing the pressure from the company's Fukushima No. 1 nuclear power plant by opening their valves may let a small amount of radioactive substances leak out into the atmosphere, according to Tokyo Electric Power.

The safety of nearby residents will be ensured as all the residents in a 10-kilometer radius from the power plant have been evacuated or instructed by the government to stay at home, according to the sources.

Immediately after the 8.8-magnitude quake hit northeastern Japan, all the three operating reactors at the power plant stopped automatically.

Internal pressure is feared to have risen at all the reactors. The pressure in the No. 1 reactor increased to 600 kilopascals from the normal level of 400 kilopascals.

Meantime, Tokyo Electric Power is striving to restore the No. 2 reactor's cooling system, which stopped working because the quake caused a power outage and emergency diesel power generation equipment broke down.

While the reactor's cooling water levels are still kept at about 3.5 meters above the top of its nuclear fuel rods, the level's decline would force the fuel rods exposed to air to generate radiation.

Radiation Could Already Have Leaked at Nuke Plant

Tokyo, March 12 Kyodo -- Radioactive substances could already have leaked at the Fukushima No. 1 nuclear power plant after a magnitude 8.8 earthquake hit northern Japan, the operator Tokyo Electric Power Co. said Saturday.

The amount of radiation reached around 1,000 times the normal level in the control room of the No. 1 reactor of the plant, the Nuclear and Industrial Safety Agency also said. The discovery suggests radioactive steam could spread around the facility.

The agency also said radiation has been more than eight times the normal level at a monitoring post near the main gate of the plant.

The authorities expanded the evacuation area for residents in the vicinity of the plant from a 3-kilometer radius to 10 km on the orders of Prime Minister Naoto Kan, who plans to visit the facility later Saturday.

Release

4B

Satorius, Mark

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 12:57 PM
To: Breskovic, Clarence
Subject: Japan: Radioactive Steam Could Be Released From Troubled Plant

Radioactive Steam Could Be Released From Troubled Plant

Tokyo *Kyodo World Service* 1819 GMT 11 Mar 11
Tokyo, March 12 Kyodo -- Japanese authorities are nearing a decision to release radioactive steam from a troubled nuclear reactor, industry minister Benri Kaieda said Saturday.

Kaieda was referring to the rising pressure inside the No. 1 reactor of the Fukushima No. 1 plant, which was hit by a powerful earthquake Friday.

3/22

Satorius, Mark

From: Satorius, Mark
Sent: Friday, March 11, 2011 12:35 PM
To: West, Steven; Pederson, Cynthia; Boland, Anne; Reynolds, Steven
Subject: RE:
Attachments: image001.png

I know – what the heck – coolant????

From: West, Steven
Sent: Friday, March 11, 2011 12:06 PM
To: Satorius, Mark; Pederson, Cynthia; Boland, Anne; Reynolds, Steven
Subject:

I couldn't get past the headline: "U.S. delivers coolant to Japan nuclear plant."

http://www.reuters.com/article/2011/03/11/us-japan-quake-nuclear-clinton-idUSTRE72A4LR20110311?feedType=RSS&feedName=domesticNews

Steven West, Director
Division of Reactor Projects
NRC, Region III
630-829-9600
Steven.West@nrc.gov

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W/23

A

Freeman, Eric

From: Freeman, Eric
Sent: Friday, March 11, 2011 7:38 AM
To: 'Amanda Brody'
Subject: Wow - huge earthquake in Japan

A very large Earthquake hit Japan last night our time. Apparently it was an 8.8 magnitude and they are reporting a lot of injuries

w/24

From: HOO Hoc
To: Marshall, Jane; HOO Hoc
Subject: UPDATE to Event Notice 46668: 3/11/2011
Date: Friday, March 11, 2011 12:50:28 PM
Attachments: Events.pdf

Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
Phone: 301-816-5100
Fax: 301-816-5151
email: hoo.hoc@nrc.gov
secure e-mail: hoo1@nrc.sgov.gov

w/25

Power Reactor Event # 46668

Site: DIABLO CANYON		**Notification Date / Time:**	03/11/2011 04:40 (EST)
Unit: 1 2 **Region:** 4 **State :** CA		**Event Date / Time:**	03/11/2011 01:23 (PST)
Reactor Type: [1] W-4-LP,[2] W-4-LP		**Last Modification:**	03/11/2011
Containment Type: DRY AMB DRY AMB			
NRC Notified by: K.R.THOMPSON	**Notifications:**	THOMAS FARNHOLTZ	R4DO
HQ Ops Officer: JOE O'HARA		JANE MARSHALL	IRD
Emergency Class: UNUSUAL EVENT		ELMO COLLINS	RA
10 CFR Section:		JACK GROBE	NRR
50.72(a) (1) (i) EMERGENCY DECLARED			

Unit	Scram Code	RX Crit	Init Power	Initial RX Mode	Curr Power	Current RX Mode
1	N	Yes	100	Power Operation	100	Power Operation
2	N	Yes	100	Power Operation	100	Power Operation

!!! This is a draft document, do not release to the public !!!

NOTICE OF UNUSUAL EVENT AS A RESULT OF A TSUNAMI WARNING IN THE AREA

The licensee declared a notice of unusual event as a result of a tsunami warning issued for the coastal areas of California. The tsunami warning is a result of a 8.9 magnitude earthquake off the coast of Japan. The licensee is in EAL HU1.5, 'Tsunami Affecting the Protected Area'. The NRC remains in the normal response mode.

The NRC Resident Inspector has been notified.

* * * UPDATE AT 1134 EST ON 3/11/2011 FROM MIKE QUITTER TO JOE O'HARA***

"A classification of unusual event was declared at 0123 PST on March 11, 2011 due to a tsunami warning issued by the NOAA for the California West Coast. Diablo Canyon Power Plant [DCPP] has implemented the requirements of Casualty Procedure M-5, 'Response to Tsunami Warning.' Plant personnel were evacuated from the DCPP intake structure at 0742 PST. Evacuation of personnel from the intake structure constitutes a deviation from DCPP license condition '2.E' and authorized pursuant! To 10CFR50.54(x).

"No damage or injuries has been observed as a result of this tsunami event and there is no impact on the health and safety of the general public."

Notified the R4DO (Farnholtz), R4RA (Collins), IRD (Marshall), and NRR (Grobe).

****

From: Hiland, Patrick – NRR
To: Grobe, Jack – NRR
Subject: RE: Please Reply - Request for NRR Staff available for phone interviews
Date: Friday, March 11, 2011 12:23:53 PM

Kamal and I were in Ops center all morning w/Mike Weber. Turns out the Japanese bi-lateral was still on-going. Kamal can answer general questions with authority.

From: Grobe, Jack NRR
Sent: Friday, March 11, 2011 12:20 PM
To: Couret, Ivonne; Hiland, Patrick
Cc: Manoly, Kamal
Subject: Re: Please Reply - Request for NRR Staff available for phone interviews

Pick thoughtfully with emphasis on capability to communicate complex information to the public .....
Jack Grobe, Deputy Director, NRR

RLRQ

From: Couret, Ivonne OPA
To: Grobe, Jack; Hiland, Patrick
Cc: Manoly, Kamal
Sent: Fri Mar 11 09:26:16 2011
Subject: Please Reply - Request for NRR Staff available for phone interviews

Pat/Jack – Can you assist in providing a staffer to participate in media interviews on seismic issues and structural requirements for US plants. I left message for Kamal I was told by Diablo Canyon's PM that he is one of the structural engineer with knowledge. We are not directing any media to RES contact at this time since they are coordinating info with Japanese. Your assistance in this matter is greatly appreciated. Ivonne

Ivonne L. Couret
Public Affairs Officer
Office of Public Affairs

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

(301) 415-8205
ivonne.couret@nrc.gov

W/26

From: Leeds, Eric NRR
To: Boger, Bruce; Grobe, Jack; Brown, Frederick; McGinty, Tim; Hiland, Patrick; Skeen, David; Ruland, William; Giitter, Joseph; Thorp, John; Virgilio, Martin; Wittick, Brian
Subject: RE: HOO HIGHLIGHT - DIABLO CANYON UNUSUAL EVENT
Date: Friday, March 11, 2011 7:42:58 AM

Great idea Bruce – thank you. And thanks for taking the call!!!!

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

rlrlqsc

From: Boger, Bruce NRR
Sent: Friday, March 11, 2011 5:32 AM
To: Leeds, Eric; Grobe, Jack; Brown, Frederick; McGinty, Tim; Hiland, Patrick; Skeen, David; Ruland, William; Giitter, Joseph; Thorp, John; Virgilio, Martin; Wittick, Brian
Subject: Fw: HOO HIGHLIGHT - DIABLO CANYON UNUSUAL EVENT

rlrlqsc

West coast landfall estimated to be around 11:00 am EST. An update call will take place at 8:00 am EST. NRR should call into the Ops Center at that time, perhaps as group from O-13D20?

From: HOO Hoc — NSIR
To: HOO Hoc
Sent: Fri Mar 11 05:09:33 2011
Subject: HOO HIGHLIGHT - DIABLO CANYON UNUSUAL EVENT

Diablo Canyon declared a Notice of Unusual Event at 0123 PST due to a Tsunami Warning for the coastal areas of California as a result of a 8.9 magnitude earthquake off the coast of Japan. The Agency remains in the NORMAL response mode as of 0452 EST.

Joe O'Hara
Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
Phone: 301-816-5100
Fax: 301-816-5151
email: hoo.hoc@nrc.gov
secure e-mail: hoo1@nrc.sgov.gov

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w/27

IFR SCREEN-IN AND ASSIGNMENT DOCUMENT

Issue for Resolution (IFR) 2011-06
Daini Nuclear Power Plant (Japan) – INES Level 3 Report – Loss of Heat Sink Due to Miyagiken-Oki Earthquake and Tsunami

IFR 2011-06 Assignment Date: 03/18/2011

Assigned to: Rebecca Sigmon is the Issue Manager for IFR 2011-06

TAC Number: ME5995

Evaluation: IFR 2011-06 - Daini Nuclear Power Plant (Japan) – INES Level 3 Report – Loss of Heat Sink Due to Miyagiken-Oki Earthquake and Tsunami (Sigmon-DIRS)

This has been entered into ROE, see record 7439.

Estimated Completion Date: 12/18/2011

Source:

03/18/2011 IOEB Operating Experience Screening Summary IFR Assignment:

Daini Nuclear Power Plant (Japan) – INES Level 3 Report – Loss of Heat Sink Due to Miyagiken-Oki Earthquake and Tsunami

(From International Nuclear and Radiological Event Scale (INES) Event Review Form)

This event has been screened in as an Issue for Resolution.

Related COMM:

COMM written by Rebecca Sigmon, dated March 29, 2011, "International - Tsunami Causes Complete Loss of Ultimate Heat Sink and Near Miss Incidents at Three Units at Fukushima DAINI Site," based on the information provided by the reports posted to the International Atomic Energy Agency (IAEA)'s nuclear events website.

This COMM was sent to the following communities: All Communications, Containment (leakage, degradation, cooling system performance), ECCS, Electrical Power Systems, Emergency Diesel Generators, Emergency Preparedness, Flood Protection & Missiles, Fuels, Natural Phenomena, New Reactors, Pump and Valve Performance, Station Service Water Systems & Ultimate Heat Sink

Background Information/Documents:

INES Event Review Form – "Loss of the Cooling Function to the Ultimate Heat Sink Due to the Big Tsunami"

Screening Guidelines met:

W/28

This event was screened in during the Operating Experience Clearinghouse screening meeting on Friday 3/18/2011. It was reviewed against the criteria of LIC-401 and determined to screen in as an Issue for Resolution in accordance with the following LIC-401 Criteria:

This event met the following screen-in criteria:

1. Potential safety significance based on risk or other quantitative factors

   B. other quantitative significance – INES rating of 1 or higher.

2. A qualitative judgment of significance based on:

   E. reactor scram with potential complications from equipment failure and external conditions

Assignment:

1) Assess the issues faced by the Fukushima Daini plant to complement assessment of issues at the Fukushima Dai'chi plant which are being addressed by the commission-directed task force. Issues of concern at Fukushima Daini including the ability to withstand beyond design-basis seismic activity, effects of beyond design basis flooding on safety related equipment, and common cause failure of safety related equipment due to beyond design basis natural phenomena will likely be addressed in detail by other Agency actions. Issues unique to Fukushima Daini which may not be addressed include vulnerability of seawater cooling (and access to the ultimate heat sink) to common cause failure, and complications arising from the potential for this common cause failure to affect multiple units at a site. Other possible issues include the operation and performance of Emergency Core Cooling Systems when the heat sink is lost, and effects on the containment from loss of the heat sink. This review should also include consideration of IFR 2010-19 (see OpE COMM), in particular the common cause failure of sea water cooling trains at multiple units on a site addressed in IRS 8068, *Total Loss of the Heat Sink Further to Clogging of the Rotating Drum Screens by a Very Significant Arrival of Vegetable Materials.* Assess the need for further Agency action (Information Notice etc.), beyond what may result from task force review, to specifically address the events at Fukushima Daini.

2) Review past history and NUREGS, industry standards/expectations, generic communications, inspection procedures, etc. related to this issue, to determine what guidance already exists and whether additional guidance may be necessary.

3) Review and evaluate industry information (any INPO SEE-IN documents) related to these issues, and any other applicable domestic or international OpE.

4) Work with the assigned technical branches as needed to achieve more consistent and clear guidance for NRC inspection staff and industry as to what actions may be required to ensure that licensees have given proper consideration to possible environmental impacts on the service water system.

5) Review for any other applications necessary per standard IFR review and closure process.

6) Draft and process a Closure Memorandum on this issue, which includes recommendations for follow-up actions and inputs or attachments providing the appropriate Technical & Safety assessment.

Recommend involving:

1) Obtain technical, safety significance, generic applicability evaluation and recommendations from SNPB (Balance of Plant Branch, Greg Casto BC), SCVB (Containment and Ventilation Branch, Robert Dennig, BC), and SRXB (Reactor Systems Branch, Greg Cranston, BC).

2) Coordinate with issue manager for IFR 2011-05, *Lessons-Learned from Japanese Earthquake and Tsunami Event,* (Dave Garmon, IOEB) to avoid duplication of effort on issues which are being covered by other Agency actions.

3) For any additional Risk Assessment / Risk Analysts insights contact APOB (PRA Operational Support Branch, Veronica Rodriguez, BC).

4) Generic Communications Branch should an Information Notice or other generic communication be warranted.

5) If NRC inspection program / inspection procedure changes are needed involve Reactor Inspection Branch and / or use ROP inspection program feedback forms.

Note:

Due to multiple efforts underway to evaluate the events in Japan and the ongoing nature of the situation, further clarification of the scope of this IFR will come over time. The IFR manager will coordinate with all technical reviewers to ensure prompt notification of new information and updates on Agency actions.

From: Sheron, Brian – RES
To: Weber, Michael; Virgilio, Martin OEDO
Cc: Leeds, Eric; Grobe, Jack
Subject: FW: Japanese Earthquake
Date: Friday, March 11, 2011 7:12:38 AM
Importance: High

FYI.

-----Original Message-----
From: Richards, Stuart – RES
Sent: Friday, March 11, 2011 6:36 AM
To: Hogan, Rosemary; Kammerer, Annie; Murphy, Andrew
Cc: Sheron, Brian; Case, Michael; Uhle, Jennifer
Subject: Japanese Earthquake
Importance: High

Rosemary/Annie/Andy

I'm sure you have heard about the 8.9 earthquake off the coast of Japan.

It resulted in a large tsunami on the Japanese coast. There is a report of problems at a Japanese nuclear plant.

We should be prepared to brief on our tsunami research. Maybe also seismic.

Additionally the tsunami wave is predicted to hit the coast of California in a few hours. Although the news reports that no damage is expected, we may be called on to comment on the impact on San Onofre and Diablo Canyon.

Thanks.
Stu

3/29

Weaver, Tonna

From: Torres, Roberto MRR
Sent: Wednesday, April 20, 2011 1:26 PM
To: Titus, Brett
Cc: Dennig, Robert
Subject: FW: Inside Fukushima

Below the only email I've originated related to Japan.

From: Torres, Roberto
Sent: Monday, April 11, 2011 2:42 PM
To: Dennig, Robert; Bettle, Jerome; Karipineni, Nageswara; Lee, Brian; Lobel, Richard; Raval, Janak; Sallman, Ahsan; Walker, Harold
Subject: Inside Fukushima

Fukushima Workers Slideshow: http://www.time.com/time/photogallery/0,29307,2058823,00.html

W/30

From: HOO Hoc - NSIR
To: HOO Hoc
Subject: HOO HIGHLIGHT - NRC IN MONITORING MODE AT 0946
Date: Friday, March 11, 2011 10:08:42 AM

The NRC is in the Monitoring Response Mode as of 0946 on 3/11/11. Region IV will take the lead for U.S. sites and HQ for international sites to provide assistance in response to the earthquake in Japan and any adverse affects from a tsunami. This response mode change is NOT associated with event number 46668.

Joe O'Hara
Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
Phone: 301-816-5100
Fax: 301-816-5151
email: hoo.hoc@nrc.gov
secure e-mail: hoo1@nrc.sgov.gov

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W/31

From: HOO Hoc - NSIR
To: HOO Hoc
Subject: HOO Highlight - NOUE Termination at Diablo Canyon
Date: Friday, March 11, 2011 7:49:53 PM

1528 PST - Diablo Canyon has terminated their Unusual Event because the tsunami warning has been reduced to a tsunami advisory. No damage occurred during this event.

Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
Phone: 301-816-5100
Fax: 301-816-5151
email: hoo.hoc@nrc.gov
secure e-mail: hoo1@nrc.sgov.gov

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W/32

From: Grobe, Jack – NRR
To: Boger, Bruce
Cc: Leeds, Eric
Subject: Re: HOO HIGHLIGHT - DIABLO CANYON UNUSUAL EVENT
Date: Friday, March 11, 2011 6:13:39 AM

Thanks for taking this one Bruce.
Jack Grobe, Deputy Director, NRR

RC/EA 8e

From: Boger, Bruce – NRR
To: Leeds, Eric; Grobe, Jack; Brown, Frederick; McGinty, Tim; Hiland, Patrick; Skeen, David; Ruland, William; Giitter, Joseph; Thorp, John; Virgilio, Martin; Wittick, Brian
Sent: Fri Mar 11 05:32:16 2011
Subject: Fw: HOO HIGHLIGHT - DIABLO CANYON UNUSUAL EVENT

West coast landfall estimated to be around 11:00 am EST. An update call will take place at 8:00 am EST. NRR should call into the Ops Center at that time, perhaps as group from O-13D20?

RC/EA 8e

From: HOO Hoc – NSIR
To: HOO Hoc
Sent: Fri Mar 11 05:09:33 2011
Subject: HOO HIGHLIGHT - DIABLO CANYON UNUSUAL EVENT

Diablo Canyon declared a Notice of Unusual Event at 0123 PST due to a Tsunami Warning for the coastal areas of California as a result of a 8.9 magnitude earthquake off the coast of Japan. The Agency remains in the NORMAL response mode as of 0452 EST.

Joe O'Hara
Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
Phone: 301-816-5100
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email: hoo.hoc@nrc.gov
secure e-mail: hoo1@nrc.sgov.gov

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W/33

458

Satorius, Mark

From: Chandrathil, Prema
Sent: Friday, March 11, 2011 12:51 PM
To: West, Steven; Holt, BJ; Satorius, Mark; Pederson, Cynthia; Shear, Gary; Reynolds, Steven; OBrien, Kenneth; Boland, Anne; Louden, Patrick; Sotiropoulos, Dina
Cc: Mitlyng, Viktoria; Heck, Jared; Logaras, Harral; Barker, Allan
Subject: RE: NRC Talking Points on Japan Earthquake and Tsunami

Thanks Steve any additional information I'm sure will be shared with OPA. New information is constantly being gathered and the talking points may change that's why I would highly encourage questions to be passed to OPA.

For the internal audience--- The exact margin is documented it's a matter of getting that information from our technical experts within the agency. Once those experts are done analyzing and reviewing the information I'm sure those details will be shared internally. Folks in R4 DRP, DRS and HQ would have more immediate knowledge about these technical details.

For the external audience--Our response (at the present time) would be to use our talking point on plant design. This is a very fluid situation and new information is constantly coming in and OPA communication adjusts with the information once it comes in from our technical experts.

Prema

From: West, Steven
Sent: Friday, March 11, 2011 12:02 PM
To: Chandrathil, Prema; Holt, BJ; Satorius, Mark; Pederson, Cynthia; Shear, Gary; Reynolds, Steven; OBrien, Kenneth; Boland, Anne; Louden, Patrick; Sotiropoulos, Dina
Cc: Mitlyng, Viktoria; Heck, Jared; Logaras, Harral; Barker, Allan
Subject: RE: NRC Talking Points on Japan Earthquake and Tsunami

Prema,

I don't know the answer to BJ's specific question. However, during a call this morning with HQ and the regional division directors I learned that we have been asked this question by external stakeholders and are preparing an answer. I image it will be passed on to you.

Steve

From: Chandrathil, Prema
Sent: Friday, March 11, 2011 11:30 AM
To: Holt, BJ; Satorius, Mark; Pederson, Cynthia; West, Steven; Shear, Gary; Reynolds, Steven; OBrien, Kenneth; Boland, Anne; Louden, Patrick; Sotiropoulos, Dina
Cc: Mitlyng, Viktoria; Heck, Jared; Logaras, Harral; Barker, Allan
Subject: RE: NRC Talking Points on Japan Earthquake and Tsunami

Without bringing an seismologist in to answer the question more specifically...the margin varies at each site and the plants are designed to withstand the most severe natural phenomena historically reported with the additional margin. A seismologist would be able to provide more on the exact numbers but basically the margin in California is not the same in Illinois.
Hope this helps,
Prema

W134

From: Holt, BJ
Sent: Friday, March 11, 2011 10:59 AM
To: Chandrathil, Prema; Satorius, Mark; Pederson, Cynthia; West, Steven; Shear, Gary; Reynolds, Steven; OBrien, Kenneth; Boland, Anne; Louden, Patrick; Sotiropoulos, Dina
Cc: Mitlyng, Viktoria; Heck, Jared; Logaras, Harral; Barker, Allan
Subject: RE: NRC Talking Points on Japan Earthquake and Tsunami

Thanks Prema. I heard this morning on the news that the power plants in Japan were designed to withstand an earthquake of 7.0 on the Richter scale (design basis), but the recent quake was measured at 8.9. Is the margin of error that we include for existing US power plants sufficient to account for this large of a differential between historical data and an actual earthquake of similar magnitude?

From: Chandrathil, Prema
Sent: Friday, March 11, 2011 10:11 AM
To: Satorius, Mark; Pederson, Cynthia; West, Steven; Shear, Gary; Reynolds, Steven; OBrien, Kenneth; Boland, Anne; Louden, Patrick; Holt, BJ; Sotiropoulos, Dina
Cc: Mitlyng, Viktoria; Heck, Jared; Logaras, Harral; Barker, Allan
Subject: NRC Talking Points on Japan Earthquake and Tsunami

ALL:

In response to the events in Japan and the West Coast **please feel free to forward any inquiry you get to your PAO's here in the region**. We are prepared to respond to any inquiries with agency key messages. Below are some very basic talking points but please remembers we **DO NOT** want to get out in front of our Japanese counterparts concerning the events outside of the United States. Please forward this message to NRC employees who may need this information.

Thanks,
Prema

If you do get any calls – here are some basic talking points but feel free to send them my way.

The Nuclear Regulatory Commission is following events on the U.S. West Coast and U.S. Pacific interests in

the wake of the March 11 earthquake in Japan and associated tsunami.

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, the licensing bases for existing nuclear power plants are based on historical data from the area's maximum credible earthquake, with an additional margin included.

Prema Chandrathil
Public Affairs Officer
U.S. Nuclear Regulatory Commission
Region III
Lisle, IL
(630) 829-9663

prema.chandrathil@nrc.gov

Satorius, Mark

From: Collins, Elmo
Sent: Friday, March 11, 2011 9:16 AM
To: Satorius, Mark; Dean, Bill; McCree, Victor
Subject: Fw: Agency in Monitoing in Response to Tsunami Warnings and 8.9 Magniture Earthquake in Japan

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From: R4 IRC
To: R4
Sent: Fri Mar 11 10:05:10 2011
Subject: Agency in Monitoing in Response to Tsunami Warnings and 8.9 Magniture Earthquake in Japan

The NRC entered Monitoring at 09:46AM Eastern in response to the 8.9 magnitude earthquake in Japan and subsequent tsunami warnings. NRC Region IV is monitoring the impact on materials licensees in Alaska, Hawaii, and materials licensees and reactors on the Pacific Coast. NRC Headquarters is monitoring Japan's response to the current situation.

If you are not responding to the event, please stay clear of the incident response center. Thank you for your support.

Emergency Response Coordinator
NRC – Region IV

Satorius, Mark

From: Mitlyng, Viktoria
Sent: Friday, March 11, 2011 4:57 PM
To: Pederson, Cynthia; Heck, Jared; Orth, Steven; Chandrathil, Prema; Boland, Anne; Holt, BJ; Sotiropoulos, Dina; Shear, Gary; Louden, Patrick; Satorius, Mark; OBrien, Kenneth; Reynolds, Steven; West, Steven
Subject: RE: Japanese nuclear plants

Cindy,

Thank you for the informative summary.

Vika

From: Pederson, Cynthia
Sent: Friday, March 11, 2011 5:25 PM
To: Heck, Jared; Orth, Steven; Mitlyng, Viktoria; Chandrathil, Prema; Boland, Anne; Holt, BJ; Sotiropoulos, Dina; Shear, Gary; Louden, Patrick; Satorius, Mark; OBrien, Kenneth; Reynolds, Steven; West, Steven
Subject: Japanese nuclear plants

This is from today's NRR Op E.

4) MAGNITUDE 8.9 EARTHQUAKE OFF THE COAST OF JAPAN
The following information was gathered from several different sources. The best online source of information we have noted thus far is the Tokyo Electric Power Company (TEPCO) website: http://www.tepco.co.jp/en/index-e.html which is issuing hourly press releases on the status of its facilities. IOEB will continue to follow these events.

1. A magnitude 8.9 earthquake occurred approximately 80 km east of Onagawa NPP and 150 km NE of Fukushima Daichi. 5 aftershocks measuring between 6.2 and 7.1 on the Richter Scale have been reported.
2. Based on stack monitoring, no radiation releases have occurred from any nuclear facilities.
3. All units that were operating at the Onagawa, Fukushima Daichi, Fukushima Daini, and Tokai Daini sites (11 units in all) automatically shut down when the earthquake hit at 2:45 pm local time on 3/11. Remaining units at those sites were already in maintenance outages.
4. The following complications occurred:
   a. Fukushima Daichi – A first level emergency was declared at 3:42 pm local on 3/11 due to a loss of offsite power and subsequent failure of EDGs which resulted in a station blackout. The loss of EDGs may have been due to a seawater cooling issue. A backup EDG was being brought in on a truck to provide power. An evacuation was ordered out to 3 km, and residents have been told to shelter in place out to 10 km.
   b. Fukushima Daichi – A small fire occurred in a service building and was subsequently extinguished.
   c. Onagawa – A small fire occurred in the turbine building and was extinguished.
   d. Fukushima Daini – RCIC is providing cooling to all 4 units that shutdown. In Unit 1, ECCS actuated due to a possible RCS leak into containment. The first level emergency declaration also applies to Fukushima Daini Unit 1.
5. The NRC is in the Monitoring Response Mode as of 0946 on 3/11/11. Region IV will take the lead for U.S. sites and HQ for international sites to provide assistance in response to the earthquake in Japan and any adverse affects from a tsunami. This response mode change is NOT associated with event number 46668.

w/3cc

From the Region IV morning phone call

Diablo Canyon: Both units remain at power (100%). Licensee declared a notice of unusual event (NOUE) due to potential tsunami impacts from Japan's earthquake, earlier today. At this time the NOUE declaration is strictly a precautionary measure. Site access limited to essential personnel only. Several high risk maintenance activities have been suspended.

SONGS: Both units remain at power, unit 2 (100%), unit 3 (98%).

Cindy

Cynthia D. Pederson
Deputy Regional Administrator
US Nuclear Regulatory Commission
Region III
630-829-9658

Satorius, Mark

From: McCree, Victor
Sent: Friday, March 11, 2011 6:40 PM
To: Virgilio, Martin
Cc: Dean, Bill; Satorius, Mark; Collins, Elmo
Subject: News Reports of Japanese NPP Status

I just listened to the NBC and ABC news "experts" accounts of the status of the Fukishima Daiichi Nuclear Power Plant (FDNPP) Units 1 (and 2) and their forecast of what could happen if electrical power was not soon restored. Their accounts included several mis-statements that we ought to be aware of, and perhaps provide clarity in any NRC public response and/or statements that we make on this subject.

i. One expert implied that the BWR core is normally not covered, and that the ECCS systems only inject after core damage has begun.

ii. The expert also indicated that although the release of pressure from the containment at FDNPP would be filtered, that the filtration was highly unlikely to be successful.

iii. Another expert implied that nuclear power plants have a limited ability to withstand an "expected" earthquake, and that they are not designed to handle an "extraordinary" earthquake. [Note: Although the 8.9 Richter scale magnitude earthquake at FDNPP may have been beyond its design basis (or Safe Shutdown Earthquake) the SSE is, by definition, is an extraordinary earthquake.]

Vic

Satorius, Mark

From: McCree, Victor
Sent: Friday, March 11, 2011 8:52 PM
To: Collins, Elmo; Satorius, Mark; Dean, Bill
Subject: Japan Earthquake Media Comms

I don' know how closely you're following the media discussions of the Fukishiima events, but, IMHO, the communications lessons from this for NRC are already multi-fold. The President just referred to Secretary Chu and DOE offering support to Japan; however, thus far, I've not yet heard NRC mentioned by anyone, nor has any NRC official been quoted among the U.S., experts who are commenting on the event.

Vic

This email is being sent from an NRC Blackberry device.

W/38

Schaperow, Jason

From: Schaperow, Jason
Sent: Friday, March 11, 2011 4:23 PM
To: Gibson, Kathy
Subject: RE: Press Release: NRC Monitors Notice of Unusual Event at Diablo Canyon Power Plant, Tusnami Issues

How could I get it? Thanks.

From: Gibson, Kathy
Sent: Friday, March 11, 2011 4:21 PM
To: Schaperow, Jason
Subject: Re: Press Release: NRC Monitors Notice of Unusual Event at Diablo Canyon Power Plant, Tusnami Issues

I believe the Ops Center is.

From: Schaperow, Jason
To: Gibson, Kathy
Sent: Fri Mar 11 16:15:56 2011
Subject: RE: Press Release: NRC Monitors Notice of Unusual Event at Diablo Canyon Power Plant, Tusnami Issues

Thanks. Is anyone at NRC compiling a list of the events happening at Fukushima Daiichi Unit 2? To find out what is going on, I am going through the TEPCO website. It looks like they have been in SBO conditions for many, many hours.

From: Gibson, Kathy
Sent: Friday, March 11, 2011 4:13 PM
To: RES_DSA
Subject: Fw: Press Release: NRC Monitors Notice of Unusual Event at Diablo Canyon Power Plant, Tusnami Issues

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From: Sheron, Brian
To: Bonaccorso, Amy; Calvo, Antony; Case, Michael; Coe, Doug; Correia, Richard; Dion, Jeanne; Gibson, Kathy; Lui, Christiana; Richards, Stuart; Rini, Brett; Sangimino, Donna-Marie; Uhle, Jennifer; Valentin, Andrea
Sent: Fri Mar 11 14:29:02 2011
Subject: FW: Press Release: NRC Monitors Notice of Unusual Event at Diablo Canyon Power Plant, Tusnami Issues

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From: OPA Resource
Sent: Friday, March 11, 2011 11:59 AM
To: Ash, Darren; Barkley, Richard; Batkin, Joshua; Bell, Hubert; Belmore, Nancy; Bergman, Thomas; Bollwerk, Paul; Bonaccorso, Amy; Borchardt, Bill; Bozin, Sunny; Brenner, Eliot; Brock, Terry; Brown, Boris; Bubar, Patrice; Burnell, Scott; Burns, Stephen; Carpenter, Cynthia; Chandrathil, Prema; Clark, Theresa; Collins, Elmo; Couret, Ivonne; Crawford, Carrie; Cutler, Iris; Dacus, Eugene; Dapas, Marc; Davis, Roger; Dean, Bill; Decker, David; Dricks, Victor; Droggitis, Spiros; Flory, Shirley; Franovich, Mike; Gibbs, Catina; Haney, Catherine; Hannah, Roger; Harbuck, Craig; Harrington, Holly; Hasan, Nasreen; Hayden, Elizabeth; Holahan, Gary; Holahan, Patricia; Holian, Brian; Jacobssen, Patricia; Jaczko, Gregory; Jasinski, Robert; Jenkins, Verlyn; Johnson, Michael; Jones, Andrea; Kock, Andrea; Kotzalas, Margie; Ledford, Joey; Lee, Samson; Leeds, Eric; Lepre, Janet; Lew, David; Lewis, Antoinette; Loyd, Susan; Magwood, William; McCrary, Cheryl;

W/39

McGrady-Finneran, Patricia; McIntyre, David; Mensah, Tanya; Mitlyng, Viktoria; Monninger, John; Montes, David; Nieh, Ho; Ordaz, Vonna; Ostendorff, William; Owen, Lucy; Powell, Amy; Quesenberry, Jeannette; Reddick, Darani; Regan, Christopher; Reyes, Luis; Riddick, Nicole; RidsSecyMailCenter Resource; Riley (OCA), Timothy; Rohrer, Shirley; Samuel, Olive; Satorius, Mark; Schaaf, Robert; Schmidt, Rebecca; Scott, Catherine; Screnci, Diane; Shaffer, Vered; Shane, Raeann; Sharkey, Jeffry; Sheehan, Neil; Sheron, Brian; Siurano-Perez, Osiris; Steger (Tucci), Christine; Svinicki, Kristine; Tabatabai, Omid; Tannenbaum, Anita; Taylor, Renee; Temp, WDM; Thomas, Ann; Uhle, Jennifer; Uselding, Lara; Vietti-Cook, Annette; Virgilio, Martin; Virgilio, Rosetta; Walker-Smith, Antoinette; Weaver, Doug; Weber, Michael; Weil, Jenny; Werner, Greg; Wiggins, Jim; Williams, Evelyn; Zimmerman, Roy; Zorn, Jason
Subject: Press Release: NRC Monitors Notice of Unusual Event at Diablo Canyon Power Plant, Tusnami Issues

Attached for immediate posting and release.

Office of Public Affairs
US Nuclear Regulatory Commission
301-415-8200
opa.resource@nrc.gov

Schaperow, Jason

From: Schaperow, Jason
Sent: Friday, March 11, 2011 11:40 AM
To: Santiago, Patricia
Subject: FW: Tsunami video

In case you are interested...

From: M.T. Leonard [mailto:mtl@dycoda.com]
Sent: Friday, March 11, 2011 11:08 AM
To: Schaperow, Jason; kcw@dycoda.com; 'Ross, Kyle Wayne'; 'Gauntt, Randall O'
Cc: Tinkler, Charles
Subject: Tsunami video

Take a look at this video posted by BBC from a Japanese news helicopter over the tsunami.

http://www.bbc.co.uk/news/world-asia-pacific-12709850

From: Schaperow, Jason [mailto:Jason.Schaperow@nrc.gov]
Sent: Friday, March 11, 2011 8:57 AM
To: kcw@dycoda.com; mtl@dycoda.com; Ross, Kyle Wayne; 'Gauntt, Randall O'
Cc: Tinkler, Charles
Subject: Fukushima

Attached article indicates that the plant is relying on the battery for core cooling.

W/40

Rebstock, Paul

From: opa administrators [opa@nrc.gov]
Sent: Friday, March 11, 2011 12:04 PM
To: Rebstock, Paul
Subject: NRC Monitors Notice of Unusual Event at Diablo Canyon Power Plant, Tusnami Issues

W/41

Schaperow, Jason

From: Schaperow, Jason
Sent: Friday, March 11, 2011 1:59 PM
To: Murphy, Andrew
Subject: Hi

Hi Andy,

How are you?

The PRA folks talk to us in terms of pga. For example, one of the SBOs in SOARCA is the result of an earthquake with a pga in the range of 0.5 g to 1 g. The news media are saying that today's Japanese earthquake is 8.9 on the Richter scale. How do I convert this to g's?

Thanks,
Jason

W/4/2

Schaperow, Jason

From: Schaperow, Jason
Sent: Friday, March 11, 2011 2:32 PM
To: 'mtl@dycoda.com'
Subject: RE: U.S. Air Force "delivers coolant" to nuclear plant in Japan?

You're right. It doesn't make any sense, because water is the coolant. Maybe they delivered a coolant pump? Or maybe they delivered batteries which are needed for cooling?

From: M.T. Leonard [mailto:mtl@dycoda.com]
Sent: Friday, March 11, 2011 2:30 PM
To: Tinkler, Charles; 'Gauntt, Randall O'; kcw@dycoda.com; Schaperow, Jason; 'Ross, Kyle Wayne'
Subject: U.S. Air Force "delivers coolant" to nuclear plant in Japan?

Statements like these will be difficult to interpret ...

"Secretary of State Hillary Rodham Clinton said Friday morning that U.S. Air Force planes in Japan had delivered coolant to a nuclear power plant affected by the quake."

http://www.washingtonpost.com/wp-dyn/content/article/2011/03/11/AR2011031103673.html

---

From: Tinkler, Charles [mailto:Charles.Tinkler@nrc.gov]
Sent: Friday, March 11, 2011 11:15 AM
To: Gauntt, Randall O; 'kcw@dycoda.com'; Schaperow, Jason; Ross, Kyle Wayne; 'mtl@dycoda.com'
Subject: RE: Japan to evacuate residents near nuke plant - From comcast.com

I saw a very brief summary issued out of our incident response center which seemed to confirm that Fukushima Daichi (1 or 2 of the units) had an SBO. News reports that the unit was cooled thru the use of batteries might suggest RCIC was being used. NRC incident response center also indicated that another EDG was brought in or was being brought in.

Other units at the site (Fukushima Daini) were being cooled down with RCIC.

We also heard water was sloshed out of a spent fuel pool but it sounded like a trivial amount of water.

Also heard one unit may have a had a leak into containment that resulted in ECCS actuation. sketchy info on that)

From: Gauntt, Randall O [mailto:rogaunt@sandia.gov]
Sent: Friday, March 11, 2011 12:59 PM
To: 'kcw@dycoda.com'; Tinkler, Charles; Schaperow, Jason; Ross, Kyle Wayne; 'mtl@dycoda.com'
Cc: McClellan, Yvonne
Subject: Re: Japan to evacuate residents near nuke plant - From comcast.com

Something else to ponder!

From: Casey Wagner [mailto:kcw@dycoda.com]
Sent: Friday, March 11, 2011 08:42 AM
To: Charles.Tinkler@nrc.gov <Charles.Tinkler@nrc.gov>; 'Schaperow, Jason' <Jason.Schaperow@nrc.gov>; Ross, Kyle Wayne; 'M.T. Leonard' <mtl@dycoda.com>

W/43

Cc: McClellan, Yvonne; Gauntt, Randall O
Subject: Japan to evacuate residents near nuke plant - From comcast.com

Japan to evacuate residents near nuke plant

By MARI YAMAGUCHI, AP
1 hour ago
TOKYO — Japan ordered thousands of residents near a northeastern nuclear power plant to evacuate on Friday following a massive earthquake that caused a problem in the plant's cooling system.

Chief Cabinet Secretary Yukio Edano said the Fukushima No. 1 power plant was not leaking radiation. The plant is in Onahama city, about 170 miles (270 kilometers) northeast of Tokyo.

Japan's nuclear safety agency said the evacuation, ordered by the local government of Fukushima, affects at least 2,800 people. It comes after the government declared a state of emergency at the plant.

The quake triggered a power outage and when a backup generator also failed, the cooling system was unable to supply water to cool the reactor. The reactor core remains hot even after a shutdown.

Edano said residents were told to stay at least two miles (three kilometers) from the plant and to stay inside buildings.

He said both the state of emergency and evacuation order are meant to be a precaution. It was the first time Japan has declared a state of emergency at a nuclear power plant.

"We launched the measure so we can be fully prepared for the worst scenario," he said. "We are using all our might to deal with the situation."

If the outage in the cooling system persists, eventually radiation could leak out into the environment, and, in the worst case, could cause a reactor meltdown, a nuclear safety agency official said on condition of anonymity, citing sensitivity of the issue.

The plant is just south of the worst-hit Miyagi prefecture, where a fire broke out at another nuclear plant. The blaze was in a turbine building at one of the Onagawa power plants; smoke could be seen coming out of the building, which is separate from the plant's reactor, Tohoku Electric Power Co. said. It has since been extinguished.

Another plant at Onagawa is experiencing a water leak.

The U.S. Geological Survey said the 2:46 p.m. quake was a magnitude 8.9, the biggest earthquake to hit Japan since officials began keeping records in the late 1800s.

A tsunami warning was issued for a number of Pacific, Southeast Asian and Latin American nations.

From: Cusumano, Victor
To: Lubinski, John; Evans, Michele; Thomas, Brian; Hardies, Robert; Karwoski, Kenneth; Lupold, Timothy; McMurtray, Anthony; Mitchell, Matthew; Taylor, Robert
Subject: FW: Japan initiates emergency protocol after earthquake
Date: Friday, March 11, 2011 8:54:05 AM

From: Astwood, Heather
Sent: Friday, March 11, 2011 8:32 AM
To: Leeds, Eric; Boger, Bruce; McGinty, Tim; Valentine, Nicholee; Titus, Brett; Susco, Jeremy; Roquecruz, Carla; Nguyen, Quynh; Meighan, Sean; Heida, Bruce; Fields, Leslie; Cusumano, Victor; Cartwright, William; Azeem, Almas
Cc: Cullingford, Michael; Hopkins, Jon; Quinones, Lauren; Regan, Christopher; Rodriguez, Veronica
Subject: FW: Japan initiates emergency protocol after earthquake

FYI

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 6:39 AM
To: Breskovic, Clarence
Subject: Japan initiates emergency protocol after earthquake

Japan initiates emergency protocol after earthquake

11 March 2011

Nuclear Engineering International

Onagawa, Fukushima Daiichi, Fukushima Daini and Tokai nuclear power stations have automatically shut down following a magnitude 8.8 earthquake off the northeast coast of the largest island of Japan, Honshu.

All four operating plants on that coast have automatically shut down, or SCRAMmed, according to Japan Atomic Information Forum (JAIF). Higashidori 1, which is also located on Honshu's northeast coast, was shut down for a periodic inspection.

The earthquake struck at 2:45pm local time. A 6:45 pm local time report from the Japan Nuclear and Industrial Safety Agency contained more information of damage and other problems in a site-by-site report.

-A C02 fire has broken out at Onagawa nuclear power station.

-Utility TEPCO has requested the establishment of a nuclear emergency response programme for Fukushima Daiichi 1&3 and Fukushima Daini 1.

JAIF reported that Fukushima Daiichi 1, 2 and 3 automatically shut down; units 4, 5 and 6 were in maintenance outages. Fukushima Daini 1, 2, 3 and 4 automatically shut down.

JAIF has reported that TEPCO sent the emergency report because emergency diesel

generators at the two sites are out of order. It said that there is no report that the radiation was detected out of the site. It said that an emergency headquarters has been set up and will issue information hourly.

JAIF also reported that the Rokkasho reprocessing facility was being powered by emergency diesel generators. No other unusual events or radiation leaks have been reported. Nuclear power stations at Hamaoka, Kashiwazaki-Kariwa and Tomari are continuing normal operation, according to JAIF.

After an accident occurs at a nuclear power plant, the licensee must notify the national Nuclear and Industrial Safety Agency by law.

A minister in its controlling organisation, the Ministry of Economy, Trade and Industry, notifies the prime minister's office. The central nuclear emergency response headquarters (NERHQ) of the national government issues a nuclear emergency declaration, which also includes instructions about preventative measures. It receives technical advice from the Nuclear Safety Commission. The NERHQ sends a specialist and the NSC sends a commissioner to the site.

After the emergency declaration is received, the local office of the national government's NERHQ arranges prevention measures based on factors including facility information, climate and monitoring.

Nuclear emergency response operations are coordinated in one of 20 so-called off-site centres spread across Japan, which are close to, but not inside, nuclear facilities. The off-site centre's role is to be the main centre of information, incident analysis, and emergency plan organisation and direction. Two or three senior specialists for nuclear emergency preparedness work in each OFC. In normal conditions, the specialists work as nuclear power safety inspectors, checking plant operation from the viewpoint of regulation. During an emergency, the specialists organize prevention measures as a secretariat and report it to a joint council for nuclear emergency response. The joint council includes not only the local office of the national government's NERHQ and the senior specialists, but also representatives of the Nuclear Safety Commission and prefectural and municipal NERHQs.

The joint council devises instructions to residents for evacuation and/or sheltering. It also instructs the emergency services and coast guard, self-defence force, Japan Nuclear Energy Safety Organisation (JNES), the National Institute of Radiological Sciences, the Japan Atomic Energy Agency, and other bodies.

JNES has constructed a dedicated high-speed network system connecting the 20 off-site centres and other agencies called Emergency Preparedness Response Network (EPRNet). It includes video conferencing systems, e-mail, telephone, fax, and connections to a meteorological information service, a plant information collection, diagnosis, prognosis and analytical prediction tool (called ERSS), and an emergency environmental dose prediction

tool (called SPEEDI).

Schaperow, Jason

From: Schaperow, Jason
Sent: Friday, March 11, 2011 11:40 AM
To: Santiago, Patricia
Subject: FW: Fukushima
Attachments: fukushima.doc

Today's Japanese earthquake seems to have caused one of the SOARCA scenarios (long-term station blackout). Please see attached article from Bloomberg news.

From: Schaperow, Jason
Sent: Friday, March 11, 2011 10:57 AM
To: 'kcw@dycoda.com'; mtl@dycoda.com; 'Ross, Kyle Wayne'; 'Gauntt, Randall O'
Cc: Tinkler, Charles
Subject: Fukushima

Attached article indicates that the plant is relying on the battery for core cooling.

W/45

March 11 (Bloomberg) -- Residents near a Tokyo Electric Power Co. nuclear reactor were ordered to evacuate because of a possible radiation leak as Japan's strongest earthquake in a century shut power plants and oil refineries. About 1,800 residents living within 2 kilometers (1.2 miles) of the Fukushima Dai-Ichi No. 1 reactor were ordered to evacuate. Bloomberg's John Brinsley reports. (Source: Bloomberg)

About 5,800 residents near a Tokyo Electric Power Co. atomic plant were ordered to evacuate because of a possible radiation leak and the failure of the cooling system after Japan was struck by a powerful earthquake.

People within 3 kilometers (2 miles) of the Fukushima Daiichi nuclear power plant were told to evacuate, Chief Cabinet Secretary Yukio Edano said in Tokyo today. Residents within 10 kilometers were told to stay indoors, said Ryohei Shiomi, a spokesman at the Emergency Information Center of the Nuclear and Industrial Safety Agency.

Emergency power supply at the 4,696-megawatt plant 210 kilometers north of Tokyo failed after the quake triggered automatic shutdowns of the reactors, officials at the trade ministry's Nuclear and Industrial Safety Agency told reporters without identifying themselves. Power is needed to keep cooling the reactor to prevent rising pressure and damage, they said.

A battery, which can last about eight hours, is being used to cool the reactor for now, the agency officials said. Another six batteries have been secured, and the government may use military helicopters to fly them in, they said.

The 8.9-magnitude quake struck at 2:46 p.m. local time and unleashed a tsunami as high as 10 meters, engulfing towns along the northern coast and killing at least 26 people. The temblor, the biggest in more than a century, hit 130 kilometers off the coast of Sendai, north of Tokyo, at a depth of 24 kilometers, the U.S. Geological Survey said. A 7.1-magnitude aftershock followed at 4:25 p.m., it said.

Tokyo Electric is still seeking government approvals for a full restart of the Kashiwazaki Kariwa nuclear power plant, the world's biggest, which was shut after being damaged by an earthquake in 2007. The company posted its first loss in 28 years after it was forced to buy fossil fuels at record prices to make up for lost nuclear output.

To contact the reporters on this story: Tsuyoshi Inajima in Tokyo at tinajima@bloomberg.net; Yuji Okada in Tokyo at yokada6@bloomberg.net

To contact the editor responsible for this story: Will Kennedy at wkennedy3@bloomberg.net

Schaperow, Jason

From: Schaperow, Jason
Sent: Friday, March 11, 2011 11:38 AM
To: 'mtl@dycoda.com'
Subject: RE: Tsunami video

Thanks for sharing this.

From: M.T. Leonard [mailto:mtl@dycoda.com]
Sent: Friday, March 11, 2011 11:08 AM
To: Schaperow, Jason; kcw@dycoda.com; 'Ross, Kyle Wayne'; 'Gauntt, Randall O'
Cc: Tinkler, Charles
Subject: Tsunami video

Take a look at this video posted by BBC from a Japanese news helicopter over the tsunami.

http://www.bbc.co.uk/news/world-asia-pacific-12709850

From: Schaperow, Jason [mailto:Jason.Schaperow@nrc.gov]
Sent: Friday, March 11, 2011 8:57 AM
To: kcw@dycoda.com; mtl@dycoda.com; Ross, Kyle Wayne; 'Gauntt, Randall O'
Cc: Tinkler, Charles
Subject: Fukushima

Attached article indicates that the plant is relying on the battery for core cooling.

W/46

Schaperow, Jason

From: Schaperow, Jason
Sent: Friday, March 11, 2011 10:53 AM
To: 'kcw@dycoda.com'
Subject: RE: Japan to evacuate residents near nuke plant - From comcast.com

Thanks.

From: Casey Wagner [mailto:kcw@dycoda.com]
Sent: Friday, March 11, 2011 10:43 AM
To: Tinkler, Charles; Schaperow, Jason; Ross, Kyle Wayne; 'M.T. Leonard'
Cc: ymcclel@sandia.gov; rogaunt@sandia.gov
Subject: Japan to evacuate residents near nuke plant - From comcast.com

Japan to evacuate residents near nuke plant

By MARI YAMAGUCHI, AP
1 hour ago
TOKYO — Japan ordered thousands of residents near a northeastern nuclear power plant to evacuate on Friday following a massive earthquake that caused a problem in the plant's cooling system.

Chief Cabinet Secretary Yukio Edano said the Fukushima No. 1 power plant was not leaking radiation. The plant is in Onahama city, about 170 miles (270 kilometers) northeast of Tokyo.

Japan's nuclear safety agency said the evacuation, ordered by the local government of Fukushima, affects at least 2,800 people. It comes after the government declared a state of emergency at the plant.

The quake triggered a power outage and when a backup generator also failed, the cooling system was unable to supply water to cool the reactor. The reactor core remains hot even after a shutdown.

Edano said residents were told to stay at least two miles (three kilometers) from the plant and to stay inside buildings.

He said both the state of emergency and evacuation order are meant to be a precaution. It was the first time Japan has declared a state of emergency at a nuclear power plant.

"We launched the measure so we can be fully prepared for the worst scenario," he said. "We are using all our might to deal with the situation."

If the outage in the cooling system persists, eventually radiation could leak out into the environment, and, in the worst case, could cause a reactor meltdown, a nuclear safety agency official said on condition of anonymity, citing sensitivity of the issue.

The plant is just south of the worst-hit Miyagi prefecture, where a fire broke out at another nuclear plant. The blaze was in a turbine building at one of the Onagawa power plants; smoke could be seen coming out of the

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building, which is separate from the plant's reactor, Tohoku Electric Power Co. said. It has since been extinguished.

Another plant at Onagawa is experiencing a water leak.

The U.S. Geological Survey said the 2:46 p.m. quake was a magnitude 8.9, the biggest earthquake to hit Japan since officials began keeping records in the late 1800s.

A tsunami warning was issued for a number of Pacific, Southeast Asian and Latin American nations.

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Satorius, Mark

From: Operations Center Bulletin
Sent: Saturday, March 12, 2011 3:20 PM
To: OST02 HOC
Subject: NRC IS RESPONDING TO AN EMERGENCY OUTSIDE of the United States

THIS IS NOT A DRILL.

The NRC and other Federal agencies are continuing to follow an emergency occurring outside of the United States. Press releases about NRC actions are posted on www.nrc.gov. Information is also available on the NRC External Blog at: http://public-blog.nrc-gateway.gov . Employees contacted by the media are asked to refer the calls to the Office of Public Affairs at 301-415-8200

Two important reminders:

It is possible that some of us will be requested by colleagues in another country to provide technical advice and assistance during this emergency. It is essential that all such communications be handled through the NRC Operations Center. Any assistance to a foreign government or entity must be coordinated through the NRC Operations Center and the U.S. Department of State (DOS). If you receive such a request, contact the NRC Operations Officer (301-816-5100 or via the NRC Operator) immediately.

If you receive information regarding this or any emergency (foreign or domestic) and you are not certain that the NRC's Incident Response Operations Officer is already aware of that information, you should contact the NRC Operations Officer (301-816-5100 or via the NRC Operator) and provide that information.

No response to this message is required.

THIS IS NOT A DRILL

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Satorius, Mark

From: OPA Resource
Sent: Saturday, March 12, 2011 10:29 AM
To: Ash, Darren; Barkley, Richard; Batkin, Joshua; Bell, Hubert; Belmore, Nancy; Bergman, Thomas; Bollwerk, Paul; Bonaccorso, Amy; Borchardt, Bill; Bozin, Sunny; Brenner, Eliot; Brock, Terry; Brown, Boris; Bubar, Patrice; Burnell, Scott; Burns, Stephen; Carpenter, Cynthia; Chandrathil, Prema; Clark, Theresa; Collins, Elmo; Couret, Ivonne; Crawford, Carrie; Cutler, Iris; Dacus, Eugene; Dapas, Marc; Davis, Roger; Dean, Bill; Decker, David; Dricks, Victor; Droggitis, Spiros; Flory, Shirley; Franovich, Mike; Gibbs, Catina; Haney, Catherine; Hannah, Roger; Harbuck, Craig; Harrington, Holly; Hasan, Nasreen; Hayden, Elizabeth; Holahan, Gary; Holahan, Patricia; Holian, Brian; Jacobssen, Patricia; Jaczko, Gregory; Jasinski, Robert; Jenkins, Verlyn; Johnson, Michael; Jones, Andrea; Kock, Andrea; Kotzalas, Margie; Ledford, Joey; Lee, Samson; Leeds, Eric; Lepre, Janet; Lew, David; Lewis, Antoinette; Loyd, Susan; Magwood, William; McCrary, Cheryl; McGrady-Finneran, Patricia; McIntyre, David; Mensah, Tanya; Mitlyng, Viktoria; Monninger, John; Montes, David; Nieh, Ho; Ordaz, Vonna; Ostendorff, William; Owen, Lucy; Powell, Amy; Quesenberry, Jeannette; Reddick, Darani; Regan, Christopher; Reyes, Luis; Riddick, Nicole; RidsSecyMailCenter Resource; Riley (OCA), Timothy; Rohrer, Shirley; Samuel, Olive; Satorius, Mark; Schaaf, Robert; Schmidt, Rebecca; Scott, Catherine; Screnci, Diane; Shaffer, Vered; Shane, Raeann; Sharkey, Jeffry; Sheehan, Neil; Sheron, Brian; Siurano-Perez, Osiris; Steger (Tucci), Christine; Svinicki, Kristine; Tabatabai, Omid; Tannenbaum, Anita; Taylor, Renee; Temp, WDM; Thomas, Ann; Uhle, Jennifer; Uselding, Lara; Vietti-Cook, Annette; Virgilio, Martin; Virgilio, Rosetta; Walker-Smith, Antoinette; Weaver, Doug; Weber, Michael; Weil, Jenny; Werner, Greg; Wiggins, Jim; Williams, Evelyn; Zimmerman, Roy; Zorn, Jason
Subject: Press Release: NRC in Communication with Japanese Regulations
Attachments: 11-044.docx

Attached for immediate release and posting.

Office of Public Affairs
US Nuclear Regulatory Commission
301-415-8200
opa.resource@nrc.gov

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NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

Office of Public Affairs Telephone: 301/415-8200
Washington, D.C. 20555-0001
E-mail: opa.resource@nrc.gov Site: www.nrc.gov
Blog: http://public-blog.nrc-gateway.gov

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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Satorius, Mark

From: OBrien, Kenneth
Sent: Saturday, March 12, 2011 5:58 PM
To: Satorius, Mark
Subject: Out of Office: 1830 EST (March 12, 2011) USNRC Earthquake/Tsunami SitRep

I am out of the office. Please contact Steve Reynolds, or Justine Burza, Administrative Asst., if you need assistance in my absence.

Thanks

Ken

w/50

Satorius, Mark

From: Operations Center Bulletin
Sent: Sunday, March 13, 2011 10:12 AM
To: OST02 HOC
Subject: FW: NRC IS RESPONDING TO AN EMERGENCY OUTSIDE of the United States

THIS IS NOT A DRILL

The NRC is coordinating its actions with other Federal agencies as part of the U.S. government response to the events in Japan. 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 in Rockville, MD has been stood up since the beginning of the emergency in Japan and is operating on a 24-hour basis.

NRC Incident Responders at Headquarters have spoken with the agency's counterpart in Japan and offered the assistance of U.S. technical experts. Two officials from the NRC with expertise on 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 disasters.

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 in account the most severe natural phenomena historically estimated for the site and surrounding area.

The NRC will **not** provide information on the status of Japan's nuclear power plants. For the latest information on NRC actions see the NRC's web site at www.nrc.gov or blog at http://public-blog.nrc-gateway.gov.

Two important reminders:

It is possible that some of us will be requested by colleagues in another country to provide technical advice and assistance during this emergency. It is essential that all such communications be handled through the NRC Operations Center. Any assistance to a foreign government or entity must be coordinated through the NRC Operations Center and the U.S. Department of State (DOS). If you receive such a request, contact the NRC Operations Officer (301-816-5100 or via the NRC Operator) immediately.

If you receive information regarding this or any emergency (foreign or domestic) and you are not certain that the NRC's Incident Response Operations Officer is already aware of that information, you should contact the NRC Operations Officer (301-816-5100 or via the NRC Operator) and provide that information.

Other Sources of Information:

USAID – www.usaid.gov
U.S. Department 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

No response to this message is required.

W/S1

Kock, Andrea

From: Franovich, Mike
Sent: Sunday, March 13, 2011 7:04 AM
To: Ostendorff, William
Cc: Nieh, Ho; Warnick, Greg; Kock, Andrea; Zorn, Jason
Subject: FW: 0630 Japan event status update
Attachments: USNRC Earthquake-Tsunami Update.031211.0730EST.docx

Daiiichi Unit 3 (excerpt -changes from last night).

- *Alternative methods to inject water into the core are being investigated.*
- *Containment sprays used to lower pressure within the reactor containment have been cancelled.*
- *A reactor pressure vessel manual safety valve was opened to lower the reactor pressure and immediately followed by injection of sea water and boric acid into the reactor core.*

From: LIA07 Hoc
Sent: Sunday, March 13, 2011 6:31 AM
To: Al Coons; Andersen, James; Anderson, Joseph; Barker, Allan; Batkin, Joshua; Bill King; Bill King 2; Brenner, Eliot; Bubar, Patrice; Castleman, Patrick; Coggins, Angela; Collins, Elmo; Conrad Burnside; D Feighert; D Hammons; Dean, Bill; Decker, David; DIA; DIA2; Dorman, Dan; DOT; Droggitis, Spiros; DTRA; Dudek; EOP; EPA; EPA2; Franovich, Mike; Haney, Catherine; Harrington, Holly; Harry Sherwood; HHS; Hipschman, Thomas; HOO Hoc; Howell, Linda; J H-L; Jaczko, Gregory; Jim Kish; Johanna Berkey; Johnson, Michael; Kahler, Robert; L Hammond; Leeds, Eric; Logaras, Harral; Loyd, Susan; Maier, Bill; Marshall, Michael; McCree, Victor; McDermott, Brian; McNamara, Nancy; Michelle Ralston; Miller, Charles; Miller, Chris; Monninger, John; Nan Calhoun; Navy; Nieh, Ho; Orders, William; Pace, Patti; Pearson, Laura; Peter Lyons; R McCabe; R Thomson; S Horwitz; Satorius, Mark; Schmidt, Rebecca; Seamus O'Boyle; Sharkey, Jeffry; Sheron, Brian; Snodderly, Michael; Sosa, Belkys; Steve Colman; Thomas Zerr; Tifft, Doug; Timothy Greten; Trapp, James; Trojanowski, Robert; Vanessa Quinn; W Webb; Warren, Roberta; Wiggins, Jim; Williams, Kevin; Wittick, Brian; Woodruff, Gena
Subject: 0630 Japan event status update

w/52

App A

Grice, Thomas

From: Grice, Thomas
Sent: Monday, March 14, 2011 10:57 AM
To: Habighorst, Peter; Pham, Tom; Horn, Brian; Ward, Steven; Tuttle, Glenn; Aguilar, Santiago; Ani, Suzanne; Ditto, David; Freeman, Eric
Subject: RE: BRANCH CHIEF ACTION: PUBLIC MEETINGS IN THE NEXT 2 WEEKS

None.

From: Habighorst, Peter
Sent: Monday, March 14, 2011 10:03 AM
To: Pham, Tom; Grice, Thomas; Horn, Brian; Ward, Steven; Tuttle, Glenn; Aguilar, Santiago; Ani, Suzanne; Ditto, David; Freeman, Eric
Subject: FW: BRANCH CHIEF ACTION: PUBLIC MEETINGS IN THE NEXT 2 WEEKS
Importance: High

I am not aware of any public meetings between March 14 – March 31?? Please confirm ...thanks

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From: Tschiltz, Michael
Sent: Monday, March 14, 2011 10:00 AM
To: Smith, Brian; Campbell, Larry; Habighorst, Peter; Hiltz, Thomas; Silva, Patricia; Johnson, Robert
Cc: Bailey, Marissa; Smith, James; Doolittle, Elizabeth
Subject: BRANCH CHIEF ACTION: PUBLIC MEETINGS IN THE NEXT 2 WEEKS
Importance: High

Branch Chiefs.. Please put together a list of all public meetings that you are scheduled to conduct in the next 2 weeks and provide to Jim Smith by noon today.

Please include purpose, location and people planned to participate in the meeting. This is to ensure that we make sure that the people involved in these interactions are in a position to appropriately respond to questions concerning the events in Japan.

Thanks, Mike

w/53

From: Johnson, Michael, NRO
To: Sheron, Brian; Uhle, Jennifer; Grobe, Jack; Leeds, Eric
Cc: Holahan, Gary
Subject: FYI - It is beginning!
Date: Monday, March 14, 2011 10:29:14 AM
Attachments: NRC Japan earthquake letter 03.11.11.pdf

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COMMITTEES

NATURAL RESOURCES
RANKING DEMOCRAT

ENERGY AND COMMERCE

EDWARD J. MARKEY
7TH DISTRICT, MASSACHUSETTS

2108 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515-2107
(202) 225-2836

DISTRICT OFFICES:
5 HIGH STREET, SUITE 101
MEDFORD, MA 02155
(781) 396-2900

188 CONCORD STREET, SUITE 102
FRAMINGHAM, MA 01702
(508) 875-2900

http://markey.house.gov

Congress of the United States
House of Representatives
Washington, DC 20515–2107

March 11, 2011

The Honorable Greg Jaczko
Chairman
Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Dear Chairman Jaczko:

I write to request information related to the potential impacts of the devastating earthquake in Japan on that country's nuclear facilities, as well as on the implications for our own domestic industry.

The 8.9 magnitude earthquake has caused some serious damage at two nuclear facilities in Japan. The Japanese government declared an "atomic power emergency."[1] Fukushima Daiichi nuclear power plant has experienced a failure associated with its emergency diesel generators, preventing the flow of water into its cooling system. To reduce rising pressure inside the Fukushiima reactor, slightly radioactive vapor is being released.[2] Residents within a 3 km radius of Fukushima have been evacuated.[3] The United States Air Force also reportedly delivered equipment that could be used to cool the reactor.[4] The International Atomic Energy Agency (IAEA) is seeking information about whether the flow of cooling water has been restored, and about other nuclear power plants and research reactors in Japan.[5] Nuclear fuel requires continued cooling even after a plant has shut down. Failure of the cooling system for many hours is what resulted in a partial core melt at Three Mile Island in 1979.[6] There was also a fire in a turbine building at the Onagawa nuclear facility; Japanese authorities reported to the IAEA that it had been extinguished.[7]

The earthquake and tsunami pose threats to nuclear facilities in the United States. Your staff has informed mine that the Diablo Canyon nuclear power plant in San Luis Obispo, California has declared an 'unusual event' because of the tsunami warnings that have been issued. Taiwan, which has six nuclear reactors, issued a tsunami alert.

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[1] http://www.nytimes.com/2011/03/12/world/asia/12nuclear.html
[2] http://www.msnbc.msn.com/id/42025882/ns/world_news-asia-pacific/
[3] http://www.reuters.com/article/2011/03/11/us-quake-japan-iaea-statement-idUSTRE72A2F820110311
[4] http://www.reuters.com/article/2011/03/11/japan-quake-reactor-idUSL3E7EB2AH20110311
[5] http://www.iaea.org/newscenter/news/2011/tsunamiupdate.html
[6] http://www.nytimes.com/2011/03/12/world/asia/12nuclear.html
[7] http://www.reuters.com/article/2011/03/11/us-quake-japan-iaea-statement-idUSTRE72A2F820110311

ML110760007

This disaster serves to highlight both the fragility of nuclear power plants and the potential consequences associated with a radiological release caused by earthquake-related damage. We must ensure that America's nuclear power plants can withstand a catastrophic event and abide by the absolute highest standards for safety. Last year, I requested a GAO investigation[8] into the adequacy of Commission regulations associated with seismic safety. Earlier this week, I wrote[9] you regarding the Commission's pending approval of the design for the AP1000 nuclear reactor, in light of concerns raised by one of the Commission's most long-serving staff that there is a risk that an earthquake at the AP1000 could result in a catastrophic core meltdown. According to this individual:

- The AP1000 shield building failed tests because it is brittle, and could shatter "like a glass cup". About 60 percent of the shield building would consist of a building material that "failed miserably" in a physical test of its ability to withstand out-of-plane shear, one of the forces caused by an earthquake.
- Weak and inadequate computer simulations were used to "prove" the reactor shield is "strong enough".
- Earthquake forces may have been underestimated by Westinghouse.

My concerns about the vulnerabilities of the AP1000 reactor design are only heightened by the reports of the effect of the Japanese quake on their reactors.

I request your prompt attention to the questions raised in my earlier letter. In addition, I request that you provide me with responses to the following questions:

1) Please provide me with a detailed description of the earthquake and tsunami-related damage experienced by the nuclear facilities in Japan. If earthquake and tsunami-related damages are reported at other nuclear facilities, please also provide me with a detailed description of these damages. Please ensure that your response includes:
    a. a description of each specific failure that occurred
    b. the cause of each specific failure
    c. whether any radiological release occurred because of the failure
    d. whether each specific failure could have caused a radiological release if not promptly mitigated and
    e. how long each specific failure will take to fully repair
2) Please also indicate in your response whether you believe each nuclear power plant design a) that is currently in operation in this country, or b) a license for which has been submitted for approval to the Commission for eventual construction and operation in this country can withstand an earthquake or tsunami that is comparable in strength to the one experienced in Japan.
3) Please inform me whether you believe that what happened at the Japanese reactors as a result of the earthquake suggests any need for safety improvements at any U.S. reactor, and if so, what actions the Commission is taking to ensure such improvements are made.

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[8] http://markey.house.gov/docs/gaoinspection.pdf
[9] http://markey.house.gov/docs/3-7-11.ejmtonrc.pdf

4) Please inform me whether the events in Japan indicate any need for changes to the emergency response plans of U.S. nuclear power plants. Would these plans be adequate in a situation where emergency responders and other resources are needed to deal with many problems simultaneously?
5) Please indicate whether NRC regulations require nuclear reactor operators to have emergency backup power for long enough to maintain safe conditions through a crisis such as that occurring in Japan, where power may not come back online for days?[10]

Please provide your response no later than close of business on Friday April 8, 2011. If you have any questions or concerns, please have your staff contact Dr. Michal Freedhoff or Dr. Ilya Fischhoff of my staff at 202-225-2836.

Sincerely,

Edward J. Markey

Edward J. Markey

[10] http://www.nrc.gov/reading-rm/doc-collections/cfr/part050/part050-0063.html

From: Coyne, Kevin
To: Sheron, Brian
Cc: Uhle, Jennifer; Coe, Doug; Stutzke, Martin; Sancaktar, Selim
Subject: Seismic and Tsunami Hazard in PRA
Date: Monday, March 14, 2011 2:39:21 PM

Brian –

You raised a question at the standup meeting this morning regarding (1) the treatment of coupled seismic and tsunami events and (2) treatment of seismic aftershocks. I spoke with Marty Stutzke and Selim Sancaktar - the PRA Standard (ASME/ANS-Ra-Sa2009) does address the technical requirements for both seismic events and tsunamis (tsunami hazard under the technical requirements for external flooding analysis). The standard does note that uncertainties associated with probabilistic analysis of tsunami hazard frequency are large and that an engineering analysis can usually be used to screen out tsunamis. Seismic PRAs do not consider the affect of aftershocks since there are not methods to predict equipment fragility after the first main shock. Although the standard does address both these events, there are not specific requirements that require a PRA to assess a tsunami generated by a local seismic event.

Marty also checked on the Diablo Canyon and San Onofre IPEEEs - based on the Technical Evaluation Reports, Diablo did consider a locally induced tsunami in a limited way (the aux service water pumps were assumed to become flooded following a seismic event) while SONGS did not consider a coupled seismic/tsunami event.

-Kevin

W/55

App A

Grice, Thomas

From: Grice, Thomas
Sent: Monday, March 14, 2011 2:01 PM
To: Freeman, Eric; Aguilar, Santiago
Subject: RE: Some sensible comments...

Wouldn't want to bother mentioned how designs have progressed through the years. People might start asking when ours were designed and start to obstruct the renewal processes.

From: Freeman, Eric
Sent: Monday, March 14, 2011 1:23 PM
To: Aguilar, Santiago; Grice, Thomas
Subject: Some sensible comments...

Could be a lot worse :-p

"The president believes that meeting our energy needs means relying on a diverse set of energy sources that includes renewables like wind and solar, natural gas, clean coal and nuclear power," said Clark Stevens, a White House spokesman. "Information is still coming in about the events unfolding in Japan, but the administration is committed to learning from them and ensuring that nuclear energy is produced safely and responsibly here in the U.S."

w/Sa

Freeman, Eric

From: Freeman, Eric
Sent: Monday, March 14, 2011 7:48 AM
To: Aguilar, Santiago; Ward, Steven; Ditto, David; Horn, Brian; Tuttle, Glenn; Grice, Thomas; Pham, Tom; Habighorst, Peter; Ani, Suzanne
Subject: Information from ANS on the Japanese Reactor Situation
Attachments: ANS Talking Points - 2011-03-13 R1_2.pdf; ANS Japan Backgrounder.pdf

Not sure if you guys are members of ANS, but they have sent around these two documents as information.

w/52

The predominance of ANS members reside in the U.S. As we interact with our family, neighbors and citizens in our communities many questions will come based on news coverage of the nuclear power plant situation in Japan. These talking points key on the theme 'could it happen in the U.S.?' *

ANS Member Talking Points
Implications to U.S. nuclear energy program from the Japanese earthquake

It is premature for the technical community to draw conclusions from the earthquake and tsunami tragedy in Japan with regard to the U.S. nuclear energy program. Many opposed to nuclear power will try to use this event to call for changes in the U.S. Japan is facing beyond a "worst case" disaster since we, the technical community, did not hypotheses an event of this magnitude. Thus far, even the most seriously damaged of Japan's 54 reactors have not released radiation at levels that would harm the public. That is testament to the way professionals in our profession operate: our philosophy of defense in-depth, excellent designs, high standards of construction, conduct of operations, and most important the effectiveness of employees in following emergency preparedness planning.

The Nuclear Science and Technology (NS&T) community takes very seriously our commitment to safe operation of any nuclear facility and will incorporate lessons learned based on this experience into our safety and operating procedures. The ANS will facilitate the sharing of technical information so that these lessons receive wide distribution and be archived for future stewards of this technology. Some points to remember from this week:

- Nuclear power plants have proven their value to society in Japan, the United States and elsewhere. They provide large amounts of base load electricity on an around-the-clock basis, and they do so cost-effectively with the lowest electricity production costs of any large energy source. Both Japan and the United States have benefited greatly from nuclear energy; it has been instrumental in the nations' economic success over the past half century and their high standard of living.

- Our hallmark as a NS&T organization is to incorporate operating experience and lessons learned. When we fully understand the facts surrounding the event in Japan, we will share, document and use those insights to make NS&T even safer.

- Nuclear energy has been and will continue to be a key element in meeting America's energy needs. The nuclear industry sets the highest standards for safety and, through our focus on continuous learning; we will incorporate lessons learned from the events in Japan. The dominant factors determining technology used for new generation will be demand for new generation, the competitiveness of nuclear energy in comparison with other sources of electricity generation, and the continued safe operation of U.S. nuclear power plants.

- There has not been a rush to judgment on the part of U.S. policymakers during the first few days of this situation. We believe that is due in part to the recognition on their part that nuclear energy must continue to play a key role in a diversified energy portfolio that strengthens U.S. energy security and fuels economic growth.

* The genesis of this document is the NEI "Talking Points - Implications to U.S. nuclear energy program of the Japanese earthquake" dated March 13, 2011

American Nuclear Society Backgrounder:
Japanese Earthquake/Tsunami; Problems with Nuclear Reactors

3/12/2011 5:22 PM EST

To begin, a sense of perspective is needed... right now, the Japanese earthquake/tsunami is clearly a catastrophe; the situation at impacted nuclear reactors is, in the words of IAEA, an "Accident with Local Consequences."

The Japanese earthquake and tsunami are natural catastrophes of historic proportions. The death toll is likely to be in the thousands. While the information is still not complete at this time, the tragic loss of life and destruction caused by the earthquake and tsunami will likely dwarf the damage caused by the problems associated with the impacted Japanese nuclear plants.

What happened?

Recognizing that information is still not complete due to the destruction of the communication infrastructure, producing reports that are conflicting, here is our best understanding of the sequence of events at the Fukushima I-1 power station.

- The plant was immediately shut down (scrammed) when the earthquake first hit. The automatic power system worked.
- All external power to the station was lost when the sea water swept away the power lines.
- Diesel generators started to provide backup electrical power to the plant's backup cooling system. The backup worked.
- The diesel generators ceased functioning after approximately one hour due to tsunami induced damage, reportedly to their fuel supply.
- An Isolation condenser was used to remove the decay heat from the shutdown reactor.
- Apparently the plant then experienced a small loss of coolant from the reactor.
- Reactor Core Isolation Cooling (RCIC) pumps, which operate on steam from the reactor, were used to replace reactor core water inventory, however, the battery-supplied control valves lost DC power after the prolonged use.
- DC power from batteries was consumed after approximately 8 hours.
- At that point, the plant experienced a complete blackout (no electric power at all).
- Hours passed as primary water inventory was lost and core degradation occurred (through some combination of zirconium oxidation and clad failure).

- Portable diesel generators were delivered to the plant site.
- AC power was restored allowing for a different backup pumping system to replace inventory in reactor pressure vessel (RPV).
- Pressure in the containment drywell rose as wetwell became hotter.
- The Drywell containment was vented to outside reactor building which surrounds the containment.
- Hydrogen produced from zirconium oxidation was vented from the containment into the reactor building.
- Hydrogen in reactor building exploded causing it to collapse around the containment.
- The containment around the reactor and RPV were reported to be intact.
- The decision was made to inject seawater into the RPV to continue to the cooling process, another backup system that was designed into the plant from inception.
- Radioactivity releases from operator initiated venting appear to be decreasing.

Can it happen here in the US?

- While there are risks associated with operating nuclear plants and other industrial facilities, the chances of an adverse event similar to what happened in Japan occurring in the US is small.
- Since September 11, 2001, additional safeguards and training have been put in place at US nuclear reactors which allow plant operators to cool the reactor core during an extended power outage and/or failure of backup generators – "blackout conditions."

Is a nuclear reactor "meltdown" a catastrophic event?

- Not necessarily. Nuclear reactors are built with redundant safety systems. Even if the fuel in the reactor melts, the reactor's containment systems are designed to prevent the spread of radioactivity into the environment. Should an event like this occur, containing the radioactive materials could actually be considered a "success" given the scale of this natural disaster that had not been considered in the original design. The nuclear power industry will learn from this event, and redesign our facilities as needed to make them safer in the future.

What is the ANS doing?

ANS has reached out to The Atomic Energy Society of Japan (AESJ) to offer technical assistance.

ANS has established an incident communications response team.

This team has compiling relevant news reports and other publicly available information on the ANS blog, which can be found at ansnuclearcafe.org.

The team is also fielding media inquiries and providing reporters with background information and technical perspective as the events unfold.

Finally, the ANS is collecting information from publicly available sources, our sources in government agencies, and our sources on the ground in Japan, to better understand the extent and impact of the incident.

NSIR

Zabel, Joseph

From: Orr, Mark
Sent: Monday, March 14, 2011 7:13 AM
To: Willbanks, Charles; Davis (FSME), Jennifer; Jervey, Richard; Beissel, Dennis; Notich, Mark; Zabel, Joseph; Logan, Dennis; Rikhoff, Jeffrey; Habib, Donald
Subject: RE: Fukushima

Here is the report from the Union of Concerned Scientists – Where is the NRC's write-up?

http://allthingsnuclear.org/post/3788886037/nuclear-crisis-at-fukushima

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From: Willbanks, Charles
Sent: Monday, March 14, 2011 7:09 AM
To: Davis (FSME), Jennifer; Jervey, Richard; Beissel, Dennis; Notich, Mark; Orr, Mark; Zabel, Joseph; Logan, Dennis; Rikhoff, Jeffrey; Habib, Donald
Subject: Fukushima

Look in the upper right hand corner. There are two storage tanks that have disappeared.

W/58

All Things Nuclear

Insights on Science and Security

MARCH 11, 2011 • 26 NOTES • 22 COMMENTS

Nuclear Crisis at Fukushima

| by Ed Lyman | nuclear power | nuclear power safety | Japan nuclear |

As of 2:30 pm EST Friday 3/11/11:

The massive earthquake off the northeast coast of Japan has caused a potentially catastrophic situation at one of Japan's nuclear power plants. The situation is still evolving, but here is a preliminary assessment based on the facts as we currently understand them.

The plant's owner, Tokyo Electric Power Company (TEPCO), reported that at 2:46 p.m. local time (12:46 a.m. EST) "turbines and reactors of Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station Unit 1 ... and Units 2 and 3 ... automatically shut down due to the Miyagiken-oki Earthquake."

These reactors are 3 of the 6 operating reactors at the Fukushima I nuclear facility. All are boiling water reactors. Unit 1 has a rated output of 460 megawatts, and Units 2 and 3 each have a rated output of 784 megawatts.

TEPCO went on to state the shutdowns were caused by the loss of off-site power "due to malfunction of one out of two off-site power systems." This loss of

power triggered emergency diesel generators, which automatically started to provide backup power to the reactors.

However, at 3:41 p.m. local time (1:46 a.m. EST), the emergency diesel generators shut down "due to malfunction, resulting in the complete loss of alternating current for all three units," according to TEPCO. The failure of the diesel generators was most likely due to the arrival of the tsunami, which caused flooding in the area. The earthquake was centered 240 kilometers from Japan, and it would have taken the tsunami approximately an hour to reach the Japanese islands.

This power failure resulted in one of the most serious conditions that can affect a nuclear plant—a "station blackout"—during which off-site power and on-site emergency alternating current (AC) power is lost. Nuclear plants generally need AC power to operate the motors, valves and instruments that control the systems that provide cooling water to the radioactive core. If all AC power is lost, the options to cool the core are limited.

The boiling water reactors at Fukushima are protected by a Reactor Core Isolation Cooling (RCIC) system, which can operate without AC power because it is steam-driven and therefore does not require electric pumps. However, it does require DC power from batteries for its valves and controls to function.

If battery power is depleted before AC power is restored, however, the RCIC will stop supplying water to the core and the water level in the reactor core could drop. If it drops far enough, the core would overheat and the fuel would become damaged. Ultimately, a "meltdown" could occur: The core could become so hot that it forms a molten mass that melts through the steel reactor vessel. This would release a large amount of radioactivity from the vessel into the containment building that surrounds the vessel.

The containment building's purpose is to keep radioactivity from being released into the environment. A meltdown would build up pressure in the containment building. At this point we do not know if the earthquake damaged the containment building enough to undermine its ability to contain the pressure and allow radioactivity to leak out.

According to technical documents translated by Aileen Mioko Smith of Green Action in Japan, if the coolant level dropped to the top of the active fuel rods in the core, damage to the core would begin about 40 minutes later, and damage to the reactor vessel would occur 90 minutes after that.

Concern about a serious accident is high enough that while TEPCO is trying to restore cooling the government has evacuated a 3-km (2-mile) radius area around the reactor.

Bloomberg News reported that the battery life for the RCIC system is eight hours. This means that the batteries would have been depleted before 10 a.m. EST today. It is unclear if this report is accurate, since it suggests that several hours have elapsed without any core cooling. Bloomberg also reported that Japan had secured six backup batteries and planned to transport them to the site, possibly by military helicopter. It is unclear how long this operation would take.

There also have been news reports that Fukushima Unit 2 has lost its core cooling, suggesting its RCIC stopped working, but that the situation "has been stabilized," although it is not publicly known what the situation is. TEPCO reportedly plans to release steam from the reactor to reduce the pressure, which had risen 50% higher than normal. This venting will release some radioactivity.

More information about the cooling issue is available in this *New York Times* story.

We will post updates as more information becomes available.

1. tehlol reblogged this from allthingsnuclear
2. akirachindi07 reblogged this from allthingsnuclear
3. sesalina liked this
4. cecilemaris liked this
5. dsharpminor reblogged this from allthingsnuclear
6. eduardoe liked this
7. bleachedpersonality reblogged this from allthingsnuclear
8. firefly426 reblogged this from allthingsnuclear
9. wolfhesse liked this
10. cherishedsaulie liked this
11. alucinao liked this
12. fuckyeahglamily liked this
13. hallidude reblogged this from allthingsnuclear
14. manamaddymusic reblogged this from allthingsnuclear

15. patrix liked this
16. fattailed reblogged this from allthingsnuclear and added:
    Concerned Scientists...with smart, well-informed, measured,
17. adampdx reblogged this from allthingsnuclear
18. twkestrel reblogged this from allthingsnuclear
19. slotman reblogged this from allthingsnuclear
20. smoofff reblogged this from allthingsnuclear
21. brybry reblogged this from allthingsnuclear
22. animalpuff reblogged this from allthingsnuclear
23. masakepic liked this
24. planksmcgee liked this
25. oswaldofguadalupe reblogged this from allthingsnuclear
26. sergiorauber reblogged this from allthingsnuclear
27. allthingsnuclear posted this

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Contact All Things Nuclear

A project of the Union of Concerned Scientists

Design based on an existing theme by Sleepover

Satorius, Mark

From: Leeds, Eric
Sent: Monday, March 14, 2011 6:24 AM
To: Dean, Bill; McCree, Victor; Satorius, Mark; Collins, Elmo; Sheron, Brian; Evans, Michele; Zimmerman, Roy; Johnson, Michael
Cc: Holahan, Gary; Campbell, Andy; Correia, Richard; Uhle, Jennifer; Howell, Art; Pederson, Cynthia; Wert, Leonard; Lew, David; Weber, Michael; Virgilio, Martin; Grobe, Jack; Boger, Bruce; HOO Hoc
Subject: ACTION: Assistance to Japanese

Folks –

The Japanese requested the US supply six individuals with knowledge of the BWR 3 & 4 design to assist them in their hour of need. I'd like to discuss potential candidates with you on a conference call today at 9:30 am. I will work through the HOOs to set up a conference call and send you the number. We do not have a lot of details with regard to how long, although we do know these folks will assist in their EOCs at two different locations in Japan. I'll keep you informed as we learn more.

Thanks for your help!

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

W/59

From: Nguyen, Quynh – NRR
To: Manoly, Kamal – NRR
Cc: Martin, Robert; Thomas, Eric; Meighan, Sean; Boger, Bruce; Grobe, Jack
Subject: FW: Earthquake
Date: Tuesday, March 15, 2011 12:05:12 PM

Kamal,

We are working on earthquake question responses. Maybe you want to start thinking about responding with how the plants are built?

From: Kammerer, Annie – RES
Sent: Tuesday, March 15, 2011 11:04 AM
To: Ake, Jon; Munson, Clifford – RES
Cc: Meighan, Sean; Nguyen, Quynh
Subject: RE: Earthquake

Jon/Cliff: another request, but something we can do later today. Quynh and Sean preparing a response to the questions, "what if an 8.9 happened at one of our plants." This is an obvious question from the public who doesn't understand tectonics and one that we are going to be asked over and over.

I'm suggesting the approach to developing the response:

1) Explain that an 8.9 can't happen at the plants
2) Explain that plants are designed to ground motions and not magnitudes
3) Figure out the distance from the plane to the plants in Japan. Try to determine rough estimates of the ground motions at the plants (note, we have some numbers on the shakemap, but they are too low based on the recording of 0.58g at onagawa) (Jon do you have a subduction model at your fingertips?)
4) use that estimate to compare to the ground motions and to say "this ground motion is only expected every XX years on average at this plant. However an 8.9 can't occur because it requires a subduction zone...."

This needs to be written up so that the public can understand.

Again, this is not the top of the list, but something to do today when we get a breather.

Sean/Quynh: we'll do our best.

Annie

From: Kammerer, Annie – RES
Sent: Tuesday, March 15, 2011 10:34 AM
To: Nguyen, Quynh
Cc: Meighan, Sean
Subject: RE: Earthquake

From: Nguyen, Quynh

3/60

Sent: Tuesday, March 15, 2011 10:33 AM
To: Kammerer, Annie
Cc: Meighan, Sean
Subject: Earthquake

From: Grobe, Jack NRR
To: Ross-Lee, MaryJane
Subject: Fw: UPDATE re: interagency briefing tomorrow at 1pm
Date: Monday, March 14, 2011 7:23:07 PM

Jack Grobe, Deputy Director, NRR

From: Borchardt, Bill NRO
To: HOO Hoc; Grobe, Jack; Dorman, Dan; Weber, Michael
Cc: Powell, Amy; Schmidt, Rebecca; Batkin, Joshua; Virgilio, Martin; Rihm, Roger
Sent: Mon Mar 14 16:58:23 2011
Subject: FW: UPDATE re: interagency briefing tomorrow at 1pm

I request the ET in the Ops Center to prepare talking points for my use during this meeting. I would also like an updated status report Tues AM. You might want to start with the briefing sheet Marty used to brief congressional staff this afternoon.

From: Powell, Amy OCA
Sent: Monday, March 14, 2011 4:15 PM
To: Borchardt, Bill
Cc: Schmidt, Rebecca; Batkin, Joshua; Taylor, Renee; Virgilio, Martin
Subject: UPDATE re: interagency briefing tomorrow at 1pm

Bill –

We just got some additional information about tomorrow's interagency briefing that the White House is arranging with both Senate and House Leadership and Committees. The briefing will be at **1pm on the Senate side (room TBD)**. There will be one briefing that will include staff from both the House and Senate; with both chambers in session, I would not be surprised if a few Members came as well.

Either Becky or I will go down with you – I'll pass along additional information as I get it.

Thanks,
Amy

Amy Powell
Associate Director
U. S. Nuclear Regulatory Commission
Office of Congressional Affairs
Phone: 301-415-1673

3/61

From: Nguyen, Quynh – NRR
To: Stone, Rebecca – NSIR
Cc: McDermott, Brian; Brenner, Eliot; Leeds, Eric; Boger, Bruce; Grobe, Jack; Couret, Ivonne; Azeem, Almas; Cartwright, William; Cusumano, Victor; Heida, Bruce; Mahoney, Michael; Meighan, Sean; Nguyen, Quynh; Roquecruz, Carla; Susco, Jeremy; Titus, Brett; Valentine, Nicholee; Wertz, Trent
Subject: FW: (Action) Tsunami Fact Sheet - NUREG issued in March 2009 Link
Date: Monday, March 14, 2011 5:34:31 PM

Rebecca,

I understand Eliot's requirements. Ivonne can attest to how quickly we can modify the SharePoint site to fulfill needs.

Per Eric Leeds' direction, I have set up the SharePoint Portal (It resides in its current location so I can serve as Site Administrator. Later on, we can set up links to point to it at appropriate locations.)

It is a document library. I have given you Contributor rights (let me know who else in NSIR/OPA needs it).

I can change descriptions, columns (heading names, add/subtract), and will prepare how to "search" guidance.

"FAQ Related to Events Occurring in Japan"
http://portal.nrc.gov/edo/nrr/NRR%20TA/FAQ%20Related%20to%20Events%20Occuring%20in%20Japan/Forms/AllItems.aspx

Again, Eric wants to go "live" by the end-of-the-week so Regions and other internal stakeholders can access the information. Any idea when we will start populating?

Thanks,
Quynh

release

From: Stone, Rebecca – NSIR
Sent: Monday, March 14, 2011 4:25 PM
To: Nguyen, Quynh – NRR
Cc: Meighan, Sean
Subject: FW: (Action) Tsunami Fact Sheet - NUREG issued in March 2009 Link

Quynh,

I have been coordinating with Brian McDermott and Eliot Brenner and here is what we have come up with. You are to go ahead and begin building the site. It should be READ ONLY (this is very important because OPA doesn't want anybody to change what they have approved) and have search capabilities. When Eliot or his team approve a Q&A or Talking Points document, they will send it to an Ops Center email address. Only a few specified people will be able to access this address. These same people (and only these people) will have the capability to upload to the SharePoint site. That way, anyone can see our internal information as it becomes available without changing it.

It is important to note that Eliot has tentatively approved this plan. He is going to check with some people to make sure this is a acceptable course of action. I will get back to you with an update tomorrow.

Rebecca Stone
Response Program
Office of Nuclear Security and Incident Response
U.S. Nuclear Regulatory Commission
301-415-5634 (Office)
e-mail: Rebecca.Stone@nrc.gov

From: Nguyen, Quynh – NRR
Sent: Monday, March 14, 2011 4:02 PM
To: Stone, Rebecca – NSIR
Subject: FW: (Action) Tsunami Fact Sheet - NUREG issued in March 2009 Link

Rebecca,

OK, here's the official tasking... Sorry for putting you on the spot – Eric Leeds (NRR Office Director) was in my office. Jack Grobe is my direct supervisor.

Sean Meighan is my equivalent so keep him in the loop as you gather the requested documents.

I will set up the SharePoint and give you Contributor Rights.

I'll be out on Thursday as I'll be celebrating St. Patty's Day and March Madness (I'm gonna be at the opening rounds at Verizon – I hope there is a team I dislike so I can distract them at the foul line!).

Given recent events, I'll have to be good so I can come back to the office on Friday!

release

w/62

Quynh

From: Leeds, Eric – NRR
Sent: Monday, March 14, 2011 3:39 PM
To: Grobe, Jack; Virgilio, Martin; Weber, Michael
Cc: Nguyen, Quynh; Ruland, William; Skeen, David; Brown, Frederick; Brenner, Eliot; Collins, Elmo; Dean, Bill; Satorius, Mark; McCree, Victor; Schmidt, Rebecca; Boger, Bruce
Subject: FW: (Action) Tsunami Fact Sheet - NUREG issued in March 2009 Link

FYI – I've asked Quynh Nguyen to work with the Ops Center to create a share-point site to house our Q&As from the Japanese quake and tsunami. Attached is a list of Q&As we created during the last tsunami, which we should consider. The regions requested Q&As to support their EOC meetings next week with members of the public. I'd like to have something completed by the end of the week for the regions.

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

release

From: Boger, Bruce – NRR
Sent: Monday, March 14, 2011 9:21 AM
To: Leeds, Eric
Subject: FW: (Action) Tsunami Fact Sheet - NUREG issued in March 2009 Link

release

FYI—this is a knowledge management challenge. We've collected information in the past, but we have to drag it out and it's not available in the Ops center.

From: King, Mark
Sent: Monday, March 14, 2011 7:23 AM
To: Boger, Bruce; Brown, Frederick; Thorp, John
Cc: Thomas, Eric
Subject: RE: (Action) Tsunami Fact Sheet - NUREG issued in March 2009 Link

release

I think the attached is what Bruce is referring to – a natural phenomena limitations document. See attached.

From: Boger, Bruce – NRR
Sent: Monday, March 14, 2011 7:20 AM
To: Brown, Frederick; King, Mark; Thorp, John
Cc: Thomas, Eric
Subject: RE: (Action) Tsunami Fact Sheet - NUREG issued in March 2009 Link

release

Great. Thanks. This is a start. I still remember something that was created to provide some plant-specific protection information. (e.g., Diablo Canyon has some tsunami protection). I believe we explored west coast plants for tsunamis and east coast plants for hurricane flooding protection. If you can't find it easily (or if Bruce's gray matter failed again), please reach out to the west coast plant PMs to see what tsunami protection they have. I suspect we'll receive some cards and letters. Thanks again.

From: Brown, Frederick – NRR
Sent: Monday, March 14, 2011 7:10 AM
To: King, Mark; Thorp, John
Cc: Thomas, Eric; Boger, Bruce
Subject: RE: (Action) Tsunami Fact Sheet - NUREG issued in March 2009 Link

release

Thanks Mark

From: King, Mark – NRR
Sent: Monday, March 14, 2011 7:08 AM
To: Thorp, John; Boger, Bruce
Cc: Brown, Frederick; Thomas, Eric
Subject: RE: (Action) Tsunami Fact Sheet - NUREG issued in March 2009 Link

release

We had a NUREG issued on this subject back in March 2009.

TSUNAMI HAZARD ASSESSMENT AT NUCLEAR POWER PLANT SITES IN THE UNITED STATES OF AMERICA
Click link to view: [NUREG/CR-6966]

http://pbadupws.nrc.gov/docs/ML0915/ML091590193.pdf

From: Thorp, John - NRR
Sent: Monday, March 14, 2011 6:57 AM
To: Boger, Bruce
Cc: Brown, Frederick; King, Mark; Thomas, Eric
Subject: RE: (Action) Tsunami Fact Sheet

We'll look for it; If we don't find it quickly, we'll start producing one. (Mark King, please start looking)

I take it we would define & describe the tsunami phenomena, then address which nuclear stations in the U.S. are located in areas subject to tsunami waves, and describe what we can regarding the design of plants to withstand tsunami impacts?

Thanks,

John

From: Boger, Bruce - NRR
Sent: Monday, March 14, 2011 6:48 AM
To: Thorp, John
Cc: Brown, Frederick
Subject: Tsunami Fact Sheet

I seem to recall that OpE developed a tsunami fact sheet? Should we dust it off?

From: Sheron, Brian IRES
To: Johnson, Michael; Uhle, Jennifer; Grobe, Jack; Leeds, Eric
Cc: Holahan, Gary
Subject: RE: FYI - It is beginning!
Date: Monday, March 14, 2011 10:59:02 AM

Somebody ought to ask the Congressman if he's like NRC to help the Japanese or respond to his stupid questions.

From: Johnson, Michael
Sent: Monday, March 14, 2011 10:29 AM
To: Sheron, Brian; Uhle, Jennifer; Grobe, Jack; Leeds, Eric
Cc: Holahan, Gary
Subject: FYI - It is beginning!

From: ANS.HOC@nrc.gov NSIR
Subject: ACTION: *URGENT CHANGE* Provide Japan Input to Eric Leeds By 1100 EDT L
Date: Monday, March 14, 2011 10:50:29 AM

URGENT CHANGE Please provide input to Sean Meighan by 1100 EDT today, 3/14/11, concerning the trip to Japan. Call 301-816-5100 if you have questions. Sean may be reached at 301-415-1020. You may call 301-816-5164 at this time and follow the voice prompts if you do not wish to receive this notification from our Automatic Notification System.

3/64

From: Hilton, Nick
To: Grobe, Jack; Nguyen, Quynh; Cheok, Michael; Klein, Alex; Leeds, Eric
Subject: RE: NEI Meetings with Eric Leeds and Jack Grobe
Date: Monday, March 14, 2011 2:22:54 PM

Jack,

We can probably provide a reasonable draft paper mid next week, if that works OK for you. If you think we need something much sooner, we can probably put something out sooner, but obviously the quality will be a little better if we work it a little more before putting out for comments.

Nick

From: Grobe, Jack
Sent: Monday, March 14, 2011 1:28 PM
To: Nguyen, Quynh; Cheok, Michael; Klein, Alex; Leeds, Eric; Hilton, Nick
Subject: Re: NEI Meetings with Eric Leeds and Jack Grobe

Q,

Please get with Jim Anderson/Brian Wittick and see what you can do to move this along. While nothing is firm until the Five Great Americans speak on the issue, if the industry can get the paper they can begin thinking about which licensees would come when and then adjust if the Commission addresses the question of staggering with a different twist.

Mike/Alex,

We need to start planning for a meeting with the industry to discuss staggering approach. Possibly after the paper is released we can start with a phone call to help industry understand our needs and then a public meeting to finalize the information that we need for the new draft discretion policy - probably a complete list of plants and submission dates.

We cannot do all these things in series or we will not get done in time.

Nick,

When will I see a draft of the Commission Paper with the draft discretion proposal. We can get close to final and fill oin the blanks later. I sense that there will be a lot of noodling on the draft by the various internal stakeholders.

Thanks to all. We should probably set a target of April 15 for the final discretion paper to get to 17/18 so the Commission has enough time to act and still give the staff/industry time to implement.
Jack Grobe, Deputy Director, NRR

release

From: Nguyen, Quynh
To: MARION, Alex <axm@nei.org>
Cc: Grobe, Jack
Sent: Mon Mar 14 13:11:10 2011
Subject: RE: NEI Meetings with Eric Leeds and Jack Grobe

Alex,

w/65

I checked upstairs and it has not been released publicly yet – when I get word, I will send to you.

Also, Jack will be covering the Ops Center from 1500-2300 all week so I'll do my best to cover regarding NEI activities!

release

Quynh

From: MARION, Alex [mailto:axm@nei.org]
Sent: Monday, March 14, 2011 11:09 AM
To: Nguyen, Quynh
Cc: Grobe, Jack
Subject: RE: NEI Meetings with Eric Leeds and Jack Grobe

Can someone please send me the SECY paper proposing a staggered review schedule. I understand it has been released but we can seem to obtain it from your website. Thank you in advance.

release

From: Nguyen, Quynh [mailto:Quynh.Nguyen@nrc.gov] – NRC
Sent: Monday, March 14, 2011 10:53 AM
To: MARION, Alex – NEI
Cc: Schwarz, Sherry; Cohen, Shari; Grobe, Jack; Leeds, Eric
Subject: NEI Meetings with Eric Leeds and Jack Grobe

Alex,

I just called and left you a message. Given the recent events in Japan, I recommend that we postpone your status periodic with Eric Leeds and Jack Grobe (both occurring on March 16).

I believe you are scheduled to meet with Jack on March 30th.

release

Can you confirm receipt of cancellations? Meeting on 30th?

Thanks,
Quynh

message. IRS Circular 230 disclosure: To ensure compliance with requirements imposed by the IRS and other taxing authorities, we inform you that any tax advice contained in this communication (including any attachments) is not intended or written to be used, and cannot be used, for the purpose of (i) avoiding penalties that may be imposed on any taxpayer or (ii) promoting, marketing or recommending to another party any transaction or matter addressed herein.

Sent through mail.messaging.microsoft.com

From: Sheron, Brian – RES
To: Johnson, Michael; Holahan, Gary
Cc: Leeds, Eric; Virgilio, Martin; Borchardt, Bill; Grobe, Jack; Boger, Bruce; Williams, Donna; Wiggins, Jim
Subject: RE: Recommendation for proactive action by NRC in light of Japan events
Date: Monday, March 14, 2011 2:07:47 PM

It would be nice if the industry was even more proactive, by having NEI send us a letter says something to the effect that in the wake of the Japanese disaster here is a list of all the things the commercial U.S. nuclear licensees are doing. Hopefully this would be the kind of stuff Gary mentioned, and maybe other stuff as well.

From: Johnson, Michael – NRO
Sent: Monday, March 14, 2011 2:02 PM
To: Holahan, Gary
Cc: Leeds, Eric; Virgilio, Martin; Borchardt, Bill; Grobe, Jack; Boger, Bruce; Sheron, Brian; Williams, Donna; Wiggins, Jim
Subject: RE: Recommendation for proactive action by NRC in light of Japan events

Thanks Gary. NRR's lead of course. I like the idea using this as an opportunity to highlight the importance of previous requirements/actions as a proactive step. We will need to think about the correct vehicle. I also like having industry involved up front in whatever we decide to do.

From: Holahan, Gary – NRO
Sent: Monday, March 14, 2011 1:55 PM
To: Johnson, Michael – NRO OEDO, RES
Cc: Leeds, Eric; Virgilio, Martin; Borchardt, Bill; Grobe, Jack; Boger, Bruce; Sheron, Brian; Williams, Donna; Wiggins, Jim
Subject: Recommendation for proactive action by NRC in light of Japan events

Mike,

The events in Japan reinforce the importance of preparedness for the unexpected. In that light, I suggest that NRC take some form of proactive step to reinforce both the Severe Accident Management Guidelines and the 50.54 (hh) (formerly B.5.b) protection for "Loss of Large Area of the plant from fires and explosions".

50.54 (hh) seems particularly relevant, stating "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..."

The NRC could issue Orders, Bulletins, or letters on an expedited basis (in the next few days) to require or encourage licensees to confirm their readiness to implement the severe accident management guidance and strategies under 50.54 (hh). This would not involve any new requirements, but would simply reinforce the existing requirements.

I recommend that we coordinate this activity with the industry to ensure their full and early cooperation. This would be similar to the level of cooperation we undertook for the security bulletins following 9/11.

3/16

Gary

From: Leeds, Eric – NRR
To: Johnson, Michael
Cc: Holahan, Gary; Grobe, Jack; Boger, Bruce; Ruland, William
Subject: RE: Recommendation for proactive action by NRC in light of Japan events
Date: Monday, March 14, 2011 5:52:52 PM

I like Gary's thought also. Now's the time. NRR's lead.

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

RIRA 8

From: Johnson, Michael – NRO
Sent: Monday, March 14, 2011 2:02 PM
To: Holahan, Gary
Cc: Leeds, Eric; Virgilio, Martin; Borchardt, Bill; Grobe, Jack; Boger, Bruce; Sheron, Brian; Williams, Donna; Wiggins, Jim
Subject: RE: Recommendation for proactive action by NRC in light of Japan events

Thanks Gary. NRR's lead of course. I like the idea using this as an opportunity to highlight the importance of previous requirements/actions as a proactive step. We will need to think about the correct vehicle. I also like having industry involved up front in whatever we decide to do.

From: Holahan, Gary – NRO
Sent: Monday, March 14, 2011 1:55 PM
To: Johnson, Michael
Cc: Leeds, Eric; Virgilio, Martin; Borchardt, Bill; Grobe, Jack; Boger, Bruce; Sheron, Brian; Williams, Donna; Wiggins, Jim
Subject: Recommendation for proactive action by NRC in light of Japan events

Mike,

The events in Japan reinforce the importance of preparedness for the unexpected. In that light, I suggest that NRC take some form of proactive step to reinforce both the Severe Accident Management Guidelines and the 50.54 (hh) (formerly B.5.b) protection for "Loss of Large Area of the plant from fires and explosions".

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The NRC could issue Orders, Bulletins, or letters on an expedited basis (in the next few days) to require or encourage licensees to confirm their readiness to implement the severe accident management guidance and strategies under 50.54 (hh). This would not involve any new requirements, but would simply reinforce the existing requirements.

3/67

I recommend that we coordinate this activity with the industry to ensure their full and early cooperation. This would be similar to the level of cooperation we undertook for the security bulletins following 9/11.

Gary

Schaperow, Jason

From: Santiago, Patricia
Sent: Monday, March 14, 2011 6:41 PM
To: Schaperow, Jason
Subject: RE: Op Center Rotations

Hi -thanks....I don't see a need for you to do a late shift...family etc especially if we aren't really able to help

-on a separate matter....
Did you ever send me that table of reactor types that we talked about when we were going to the RIC?
In the draft PRA/SOARCA paper I want to say what I would do next for select scenarios.... ice condenser then Mark 2 based on what was most prevalent?
thanks

-----Original Message-----
From: Schaperow, Jason
Sent: Monday, March 14, 2011 6:38 PM
To: Santiago, Patricia
Cc: Tinkler, Charles
Subject: RE: Op Center Rotations

Hi Pat,

Thanks for the email.

I am currently scheduled for two 8-hour shifts on the RST as an Accident Analyst (i.e., PRA). (My position on the RST is Severe Accident Analyst, so I am not sure why I am listed in the current schedule as an Accident Analyst.) One of my shifts starts Tuesday at 11:00 p.m., and the other starts Friday at 3:00 p.m. Earlier today, I asked the RST to move me from the 11:00 p.m. shift to one that starts earlier. However, I like your idea better, that I be taken off of shifts altogether.

The RST has no information on the design of the Fukushima Daiichi reactors 1, 2, and 3 which apparently are undergoing severe core damage events. Also, the RST has a very short list of plant status for these 3 reactors. Many of the events that have happened at these reactors are not listed. Also, no times for the events are given. In short, there is not enough information for me to do any sort of analysis. I have more information in my office.

I am planning to work my normal work hours tomorrow (8-4:45).

Thanks again,
Jason

From: Santiago, Patricia
Sent: Monday, March 14, 2011 5:43 PM
To: Schaperow, Jason; Tinkler, Charles
Subject: Op Center Rotations

Jason

I understand you were not used much today and wasn't able to catch you before you left to get feedback. If the night goes well for Charlie tonight (no calls) and things are stable, I have asked that someone substitute for your rotations in the op center or perhaps you can be on call if needed. Charlie will let us know in the am.

W/68

I also am asking that other staff be used vs you and Charlie if possible to continue SOARCA. I understand SNL/Dycoda are not being tapped so all should be able to support SOARCA.

Thanks,
Pat

Patricia A. Santiago
Chief, Special Projects Branch
Division of Systems Analysis
Office of Nuclear Regulatory Research
Phone- 301-251-7982
Fax- 301-251-7426
Patricia.Santiago@nrc.gov

Satorius, Mark

From: Harrington, Holly
Sent: Monday, March 14, 2011 7:48 PM
To: OPA Resource; Ash, Darren; Barkley, Richard; Batkin, Joshua; Bell, Hubert; Belmore, Nancy; Bergman, Thomas; Bollwerk, Paul; Bonaccorso, Amy; Borchardt, Bill; Bozin, Sunny; Brenner, Eliot; Brock, Terry; Brown, Boris; Bubar, Patrice; Burnell, Scott; Burns, Stephen; Carpenter, Cynthia; Chandrathil, Prema; Clark, Theresa; Collins, Elmo; Couret, Ivonne; Crawford, Carrie; Cutler, Iris; Dacus, Eugene; Dapas, Marc; Davis, Roger; Dean, Bill; Decker, David; Dricks, Victor; Droggitis, Spiros; Flory, Shirley; Franovich, Mike; Gibbs, Catina; Haney, Catherine; Hannah, Roger; Harbuck, Craig; Hasan, Nasreen; Hayden, Elizabeth; Holahan, Gary; Holahan, Patricia; Holian, Brian; Jacobssen, Patricia; Jaczko, Gregory; Jasinski, Robert; Jenkins, Verlyn; Johnson, Michael; Jones, Andrea; Kock, Andrea; Kotzalas, Margie; Ledford, Joey; Lee, Samson; Leeds, Eric; Lepre, Janet; Lew, David; Lewis, Antoinette; Loyd, Susan; Magwood, William; McCrary, Cheryl; McGrady-Finneran, Patricia; McIntyre, David; Mensah, Tanya; Mitlyng, Viktoria; Monninger, John; Montes, David; Nieh, Ho; Ordaz, Vonna; Ostendorff, William; Owen, Lucy; Powell, Amy; Quesenberry, Jeannette; Reddick, Darani; Regan, Christopher; Reyes, Luis; Riddick, Nicole; RidsSecyMailCenter Resource; Riley (OCA), Timothy; Rohrer, Shirley; Samuel, Olive; Satorius, Mark; Schaaf, Robert; Schmidt, Rebecca; Scott, Catherine; Screnci, Diane; Shaffer, Vered; Shane, Raeann; Sharkey, Jeffry; Sheehan, Neil; Sheron, Brian; Siurano-Perez, Osiris; Steger (Tucci), Christine; Svinicki, Kristine; Tabatabai, Omid; Tannenbaum, Anita; Taylor, Renee; Temp, WDM; Thomas, Ann; Uhle, Jennifer; Uselding, Lara; Vietti-Cook, Annette; Virgilio, Martin; Virgilio, Rosetta; Walker-Smith, Antoinette; Weaver, Doug; Weber, Michael; Weil, Jenny; Werner, Greg; Wiggins, Jim; Williams, Evelyn; Zimmerman, Roy; Zorn, Jason
Subject: RE: Press Release: NRC Sends Additional Experts to Assist Japan
Attachments: 11-048.docx

This press release has gone out with slight change. See attached.

From: OPA Resource
Sent: Monday, March 14, 2011 6:59 PM
To: Ash, Darren; Barkley, Richard; Batkin, Joshua; Bell, Hubert; Belmore, Nancy; Bergman, Thomas; Bollwerk, Paul; Bonaccorso, Amy; Borchardt, Bill; Bozin, Sunny; Brenner, Eliot; Brock, Terry; Brown, Boris; Bubar, Patrice; Burnell, Scott; Burns, Stephen; Carpenter, Cynthia; Chandrathil, Prema; Clark, Theresa; Collins, Elmo; Couret, Ivonne; Crawford, Carrie; Cutler, Iris; Dacus, Eugene; Dapas, Marc; Davis, Roger; Dean, Bill; Decker, David; Dricks, Victor; Droggitis, Spiros; Flory, Shirley; Franovich, Mike; Gibbs, Catina; Haney, Catherine; Hannah, Roger; Harbuck, Craig; Harrington, Holly; Hasan, Nasreen; Hayden, Elizabeth; Holahan, Gary; Holahan, Patricia; Holian, Brian; Jacobssen, Patricia; Jaczko, Gregory; Jasinski, Robert; Jenkins, Verlyn; Johnson, Michael; Jones, Andrea; Kock, Andrea; Kotzalas, Margie; Ledford, Joey; Lee, Samson; Leeds, Eric; Lepre, Janet; Lew, David; Lewis, Antoinette; Loyd, Susan; Magwood, William; McCrary, Cheryl; McGrady-Finneran, Patricia; McIntyre, David; Mensah, Tanya; Mitlyng, Viktoria; Monninger, John; Montes, David; Nieh, Ho; Ordaz, Vonna; Ostendorff, William; Owen, Lucy; Powell, Amy; Quesenberry, Jeannette; Reddick, Darani; Regan, Christopher; Reyes, Luis; Riddick, Nicole; RidsSecyMailCenter Resource; Riley (OCA), Timothy; Rohrer, Shirley; Samuel, Olive; Satorius, Mark; Schaaf, Robert; Schmidt, Rebecca; Scott, Catherine; Screnci, Diane; Shaffer, Vered; Shane, Raeann; Sharkey, Jeffry; Sheehan, Neil; Sheron, Brian; Siurano-Perez, Osiris; Steger (Tucci), Christine; Svinicki, Kristine; Tabatabai, Omid; Tannenbaum, Anita; Taylor, Renee; Temp, WDM; Thomas, Ann; Uhle, Jennifer; Uselding, Lara; Vietti-Cook, Annette; Virgilio, Martin; Virgilio, Rosetta; Walker-Smith, Antoinette; Weaver, Doug; Weber, Michael; Weil, Jenny; Werner, Greg; Wiggins, Jim; Williams, Evelyn; Zimmerman, Roy; Zorn, Jason
Subject: Press Release: NRC Sends Additional Experts to Assist Japan

For immediate release.

Office of Public Affairs
US Nuclear Regulatory Commission
301-415-8200
opa.resource@nrc.gov

W169

NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

Office of Public Affairs Telephone: 301/415-8200
Washington, D.C. 20555-0001
E-mail: opa.resource@nrc.gov Site: www.nrc.gov
Blog: http://public-blog.nrc-gateway.gov

No. 11-048 March 14, 2011

NRC SENDS ADDITIONAL EXPERTS TO ASSIST JAPAN

Acting as part of a U.S. Agency for International Development assistance team, the NRC has dispatched eight additional 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., 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.

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322

Red

Satorius, Mark

From: Holt, BJ
Sent: Monday, March 14, 2011 12:44 PM
To: Satorius, Mark
Subject: Out of Office: Confirmation of names for Japan

I will return to the office on Tuesday, March 15, 2011. For urgent matters, please contact Dina Sotiropoulos on 630/829-9517 or at Dina.Sotiropoulos@nrc.gov.

W/70

From:	Cullingford, Michael
To:	Leeds, Eric; Grobe, Jack; Boger, Bruce; McGinty, Tim; Regan, Christopher; Astwood, Heather; Hopkins, Jon; Quinones, Lauren; Brown, Frederick; Cheok, Michael; Lubinski, John; Ruland, William; Giitter, Joseph; Holian, Brian
Subject:	FW: Fukushima I Unit 2
Date:	Monday, March 14, 2011 8:31:45 AM

fyi

From: Hidehiko Yamachika [mailto:yamachika-hidehiko@jnes-usa.org]
Sent: Monday, March 14, 2011 7:17 AM
To: 'Hidehiko Yamachika'; Emche, Danielle; Foggie, Kirk; Cullingford, Michael
Cc: aono-kenjiro@jnes-usa.org; Michael W. Chinworth
Subject: RE: Fukushima I Unit 2

I came back.

TEPCO said that they started injection of sea water to unit 2 at 5:20am in EDT, but the injection does not work well. All of fuels seem to be uncovered.

From: Hidehiko Yamachika [mailto:yamachika-hidehiko@jnes-usa.org]
Sent: Sunday, March 13, 2011 11:09 PM
To: 'Hidehiko Yamachika'; 'Emche, Danielle'; Foggie, Kirk; Cullingford, Michael
Cc: aono-kenjiro@jnes-usa.org; Michael W. Chinworth
Subject: RE: Fukushima I Unit 3

Staff of TEPCO Fukushima 1 Office announced that parameters show that the containment vessel is sound (fine), but detail is under investigation.

From: Hidehiko Yamachika [mailto:yamachika-hidehiko@jnes-usa.org]
Sent: Sunday, March 13, 2011 10:49 PM
To: 'Hidehiko Yamachika'; 'Emche, Danielle'; Foggie, Kirk; Cullingford, Michael
Cc: aono-kenjiro@jnes-usa.org; Michael W. Chinworth
Subject: RE: Fukushima I Unit 3

A Chief Cabinet Secretary, Edano, announced at 10:45pm in EDT that explosion at Unit 3 seems to be same as that of Unit 1,and that a chief of NISA office at Fukushima 1 said that containment vessel seems to be sound.

@yamachika

From: Hidehiko Yamachika [mailto:yamachika-hidehiko@jnes-usa.org]
Sent: Sunday, March 13, 2011 10:27 PM
To: 'Hidehiko Yamachika'; 'Emche, Danielle'; Foggie, Kirk; Cullingford, Michael
Cc: aono-kenjiro@jnes-usa.org; Michael W. Chinworth
Subject: RE: Fukushima I Unit 3

According to NHK, Japanese TV media at 10:20 pm in EDT, NISA announced there is an hydrogen explosion on unit 3 of Fukushima I at 10:01 pm in EDT.
Steam like white smoke and brown smoke are recognized in the TV.

@yamachika

From: Ramsey, Jack 1 OIP
To: RST01 Hoc; Skeen, David; Ruland, William
Subject: FW: RE: Fukushima I Unit 2
Date: Monday, March 14, 2011 8:09:07 AM
Importance: High

-------- Original Message --------
Subject:RE: Fukushima I Unit 2
Date: Mon, 14 Mar 2011 11:17:27 +0000
From: Yamachika, Hidehiko <yamachika-hidehiko@jnes-usa.org>
To: Yamachika, Hidehiko <yamachika-hidehiko@jnes-usa.org>, 'Emche, Danielle' <Danielle.Emche@nrc.gov>, Foggie, Kirk <Kirk.Foggie@nrc.gov>, Cullingford, Michael <Michael.Cullingford@nrc.gov>
CC: Aono, Kenjiro <aono-kenjiro@jnes-usa.org>, Michael Chinworth <michael-chinworth@jnes-usa.org>

I came back.

TEPCO said that they started injection of sea water to unit 2 at 5:20am in EDT, but the injection does not work well. All of fuels seem to be uncovered.

1/72

Satorius, Mark

From: West, Steven
Sent: Monday, March 14, 2011 12:08 PM
To: Satorius, Mark; Pederson, Cynthia; Chandrathil, Prema; Mitlyng, Viktoria; Heck, Jared; Logaras, Harral; Barker, Allan; Reynolds, Steven; Louden, Patrick; Boland, Anne
Subject: FW: Japanese event info

FYI if you haven't already seen it.

From: Ring, Mark
Sent: Monday, March 14, 2011 11:58 AM
To: Shear, Gary; West, Steven; Cameron, Jamnes; Duncan, Eric; Giessner, John; Lara, Julio; Kunowski, Michael; Riemer, Kenneth
Subject: FW: Japanese event info

From: Phillips, Charles
Sent: Monday, March 14, 2011 11:02 AM
To: Ring, Mark; McGhee, James; Kemker, Brian; Melendez-Colon, Daneira; Draper, Jason; Orlikowski, Robert
Subject: Japanese event info

Believe it or not this is the best info I've seen on the events in Japan to date.

http://en.wikipedia.org/wiki/Fukushima_I_Nuclear_Power_Plant

Satorius, Mark

From: Ring, Mark
Sent: Monday, March 14, 2011 12:08 PM
To: Pederson, Cynthia; Satorius, Mark
Subject: FW: Japanese event info

This is pretty good.

From: Phillips, Charles
Sent: Monday, March 14, 2011 11:02 AM
To: Ring, Mark; McGhee, James; Kemker, Brian; Melendez-Colon, Daneira; Draper, Jason; Orlikowski, Robert
Subject: Japanese event info

Believe it or not this is the best info I've seen on the events in Japan to date.

http://en.wikipedia.org/wiki/Fukushima_I_Nuclear_Power_Plant

3/14

From: Mitchell, Matthew
To: Taylor, Robert
Subject: Kyodo News Story
Date: Monday, March 14, 2011 11:47:59 AM

I assume you all are getting this:

http://english.kyodonews.jp/news/2011/03/77870.html

Fukushima No. 2 reactor's fuel rods fully exposed, melting feared

TOKYO, March 14, Kyodo

Fuel rods at the quake-hit Fukushima (Dai-ichi) nuclear power plant's No. 2 reactor were fully exposed at one point after its cooling functions failed, the plant operator said Monday, indicating the critical situation of the reactor's core beginning to melt due to overheating.

The rods were exposed as a fire pump to pour seawater into the reactor to cool it down ran out of fuel, Tokyo Electric Power Co. said. The firm had reported the loss of cooling functions as an emergency to the government.

TEPCO said water levels later recovered to cover 30 centimeters in the lower parts of the fuel rods.

The seawater injection operation started at 4:34 p.m., but water levels in the No. 2 reactor have since fallen sharply with only one out of five fire pumps working. The other four were feared to have been damaged by a blast that occurred in the morning at the nearby No. 3 reactor.

The utility firm said a hydrogen explosion at the nearby No. 3 reactor that occurred Monday morning may have caused a glitch in the cooling system of the No. 2 reactor.

Similar cooling down efforts have been taken at the plant's No. 1 and No. 3 reactors and explosions occurred at both reactors in the process, blowing away the roofs and walls of the buildings that house the reactors.

It is feared that the No. 2 reactor will follow the same path. To prevent a possible hydrogen explosion at the No. 2 reactor, TEPCO said it will look into opening a hole in the wall of the building that houses the reactor to release hydrogen.

The company has also begun work to depressurize the containment vessel of the No. 2 reactor by releasing radioactive steam, the government's Nuclear and Industrial Safety Agency said. Such a step is necessary to prevent the vessel from sustaining damage and losing its critical containment function.

With only one fire pump working, TEPCO is placing priority on injecting water into the No. 2 reactor, although both the No. 1 and No. 3 reactors still need coolant water injections, according to the agency.

W/75

The blast earlier in the day injured 11 people but the reactor's containment vessel was not damaged, with the government dismissing the possibility of a large amount of radioactive material being dispersed, as radiation levels did not jump after the explosion.

TEPCO said seven workers at the site and four members of the Self-Defense Forces were injured. Of the 11, two were found to have been exposed to radiation and are receiving treatment.

Since the magnitude 9.0 quake hit northeastern Japan last Friday, some reactors at the Fukushima No. 1 plant have lost their cooling functions, leading to brief rises in radiation levels.

As a result, the cores of the No. 1 and No. 3 reactors have partially melted.

The government ordered residents within a 20-kilometer radius of the plant to evacuate Saturday in the wake of the initial blast at the plant's No. 1 reactor. A total of 483 people are still attempting to leave the area, according to the nuclear agency.

The agency ruled out the possibility of broadening the area subject to the evacuation order for now.

==Kyodo

Bano, Mahmooda

From: Scott, Michael
Sent: Monday, April 18, 2011 11:40 AM
To: RES_DSA
Subject: EXTERNAL INTERACTIONS REGARDING FUKUSHIMA

For those participating in interactions outside the Agency, and particularly international interactions, please be careful not to (1) speak for the Agency regarding Fukushima, or (2) make any commitments to activities addressing Fukushima, without discussing with your BC and the DSA front office first.

While we are all interested in this subject and many may be working on something related to it at some point, it is important that we continue to focus on our important existing work. The task force addressing lessons learned from Fukushima will help guide the Agency's future actions in that regard. Also, given the significance and outside interest regarding this issue, it is important that our external discussions on the subject be well planned and well informed.

Thanks for your understanding.

Mike

w/76

Satorius, Mark

From: jean.brown@gsa.gov
Sent: Monday, March 14, 2011 5:39 AM
To: &FEB_ONLY__Emergency_Preparedness_Advisory_Committee@gsa.gov; &FEB_ONLY__FEB_Master_List@gsa.gov; &FEB_ONLY__FEB_List_2@gsa.gov
Subject: US Ongoing Response to the Earthquakes and Tsunami in Japan

Colleagues: I am sharing this information as employees have been asking about manners in which to donate and other information.

Yesterday, White House Press Secretary Jay Carney released an overview of the United States' response in support of our friends in Japan.

- For information on how you can help directly, US AID has pulled together options for donating to support the response effort. http://www.usaid.gov/
- Any 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.
- View www.usa.gov for additional resources;

STATEMENT: Our thoughts and our prayers remain with the people of Japan. The President has been kept fully briefed on developments and the response throughout the weekend. As directed by the President, we have offered our Japanese friends whatever assistance is needed as America will stand with Japan as they recover and rebuild. We have already been helping in a number of ways. USAID is coordinating the overall U.S. government efforts in support of the Japanese government's response to the earthquakes and subsequent tsunami that hit Friday and are currently directing individuals to www.usaid.gov for information about response donations.

The U.S. Ambassador declared an emergency which opened up an immediate funding of $100K from USAID's Office of Foreign Disaster Assistance. They 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 45 metric tons of rescue equipment are also on the ground in Misawa, Japan and will begin searching at first light March 14. The Department of Defense has the USS Reagan on station off the coast of Japan and the USS Essex en route, 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.

Officials from the Department of Energy, NRC, and other agencies have maintained contact with Japanese officials and will provide whatever assistance the Japanese government requests as they work to stabilize their damaged nuclear reactors. United States citizens in Japan are encouraged to follow the protective measures recommended by the Japanese government. The NRC has announced that these measures appear to be consistent with steps the United States would take. With regards to the United States, the NRC has released information stating that Hawaii, Alaska, the U.S. Territories and the U.S. West Coast are not expected to

experience any harmful levels of radioactivity. For instance, according to the NRC, the U.S. evacuation standard at 10 miles is roughly equivalent to the 20-kilometer distance recommended in Japan. The United States and Japan both have highly advanced capabilities for monitoring and predicting the path of any radioactive release. American citizens in Japan should continue to listen to the local authorities regarding evacuation notices and any other preparedness measures and should contact the State Department if they have any questions.

http://www.whitehouse.gov/blog/2011/03/13/ongoing-response-earthquakes-and-tsunami-japan

Jean Brown
Executive Director, Chicago Federal Executive Board
77 W. Jackson Suite 2115, Chicago, IL 60604
p: 312-353-6790, f: 312-353-3058
e: Jean.Brown@GSA.Gov
www.Chicago.FEB.GOV

Schaperow, Jason

From: Schaperow, Jason
Sent: Monday, March 14, 2011 4:06 PM
To: Gonzalez, Sergio
Subject: RE: Electronic copies

Sorry I wasn't here today. I was sent to the Ops Center to assist with the response to the Japanese reactor accident.

-----Original Appointment-----
From: Gonzalez, Sergio
Sent: Monday, March 14, 2011 7:13 AM
To: Schaperow, Jason
Subject: Accepted: Electronic copies
When: Monday, March 14, 2011 10:00 AM-10:30 AM (GMT-05:00) Eastern Time (US & Canada).
Where: Jason's office

W178

Schaperow, Jason

From: Schaperow, Jason
Sent: Monday, March 14, 2011 11:24 AM
To: Circle, Jeff
Cc: Tinkler, Charles
Subject: FW:

From: Tinkler, Charles
Sent: Friday, March 11, 2011 5:35 PM
To: 'mtl@dycoda.com'; Gauntt, Randall O; Schaperow, Jason
Subject:

I added a sentence to clarify that in the mitigated case we could have vented after roughly 18 hrs.

Charles Tinkler
Charles.Tinkler@nrc.gov

w/79

Rivera-Lugo, Richard

From: Rivera-Lugo, Richard
Sent: Monday, March 14, 2011 10:01 AM
To: Weaver, Thomas
Subject: Liquefaction Video - Japan

This video was taken last Friday, in japan after EQ

http://www.youtube.com/watch?v=j6K6JcAB9T0

w/80

Lee, Richard

From: Lee, Richard
Sent: Monday, March 14, 2011 7:29 AM
To: RES_DSA_FSTB
Cc: Voglewede, John
Subject: FW: Talking Points on Implications of Fukushima Accident to U.S. Nuclear Plants
Attachments: ANS Talking Points - 2011-03-13 R1_2.pdf ← see next pg

fyi

-----Original Message-----
From: Joe Colvin [mailto:president@ans.org]
Sent: Monday, March 14, 2011 1:11 AM
To: Lee, Richard
Subject: Talking Points on Implications of Fukushima Accident to U.S. Nuclear Plants

Dear ANS Members:

Over the last two days, the ANS Crisis Communications team has been very proactive and has handled a multitude of media and press calls. ANS spokespersons have participated in national television, radio and press interviews providing the views of the nuclear science and technology experts within the Society. We are particularly grateful to Dr. Dale Klein who has given tremendous support to the Society and the public in response to the events at Fukushima.

We have begun fielding media inquiries about the implications of the problems at Fukushima on the US program. We have prepared the attached talking points to assist responders to this line of questions. The talking points are consistent with the talking points prepared by the Nuclear Energy Institute (NEI) on the same subject.

Thank you all for your strong support!

Joe

w/81

The predominance of ANS members reside in the U.S. As we interact with our family, neighbors and citizens in our communities many questions will come based on news coverage of the nuclear power plant situation in Japan. These talking points key on the theme 'could it happen in the U.S.?' *

ANS Member Talking Points
Implications to U.S. nuclear energy program from the Japanese earthquake

It is premature for the technical community to draw conclusions from the earthquake and tsunami tragedy in Japan with regard to the U.S. nuclear energy program. Many opposed to nuclear power will try to use this event to call for changes in the U.S. Japan is facing beyond a "worst case" disaster since we, the technical community, did not hypotheses an event of this magnitude. Thus far, even the most seriously damaged of Japan's 54 reactors have not released radiation at levels that would harm the public. That is testament to the way professionals in our profession operate: our philosophy of defense in-depth, excellent designs, high standards of construction, conduct of operations, and most important the effectiveness of employees in following emergency preparedness planning.

The Nuclear Science and Technology (NS&T) community takes very seriously our commitment to safe operation of any nuclear facility and will incorporate lessons learned based on this experience into our safety and operating procedures. The ANS will facilitate the sharing of technical information so that these lessons receive wide distribution and be archived for future stewards of this technology. Some points to remember from this week:

- Nuclear power plants have proven their value to society in Japan, the United States and elsewhere. They provide large amounts of base load electricity on an around-the-clock basis, and they do so cost-effectively with the lowest electricity production costs of any large energy source. Both Japan and the United States have benefited greatly from nuclear energy; it has been instrumental in the nations' economic success over the past half century and their high standard of living.

- Our hallmark as a NS&T organization is to incorporate operating experience and lessons learned. When we fully understand the facts surrounding the event in Japan, we will share, document and use those insights to make NS&T even safer.

- Nuclear energy has been and will continue to be a key element in meeting America's energy needs. The nuclear industry sets the highest standards for safety and, through our focus on continuous learning; we will incorporate lessons learned from the events in Japan. The dominant factors determining technology used for new generation will be demand for new generation, the competitiveness of nuclear energy in comparison with other sources of electricity generation, and the continued safe operation of U.S. nuclear power plants.

- There has not been a rush to judgment on the part of U.S. policymakers during the first few days of this situation. We believe that is due in part to the recognition on their part that nuclear energy must continue to play a key role in a diversified energy portfolio that strengthens U.S. energy security and fuels economic growth.

* The genesis of this document is the NEI "Talking Points - Implications to U.S. nuclear energy program of the Japanese earthquake" dated March 13, 2011

Titus, Brett

From: Kammerer, Annie
Sent: Monday, March 14, 2011 12:45 PM
To: Brown, Frederick; Giitter, Joseph; Howe, Allen; Hiland, Patrick; Skeen, David; Case, Michael; Ruland, William; Dudes, Laura
Cc: McDermott, Brian; Ross-Lee, MaryJane; Hasselberg, Rick
Subject: RE: (Action) Tsunami Fact Sheet - NUREG issued in March 2009 Link
Attachments: NRC TsunamiPaper Bagchi.pdf; Paper 15-0007 Kammerer 14WCEE.pdf; Paper 15-0009 Kammerer 14WCEE.pdf; Appendix for DS 417 US NRC_AKammerer_GBagchi_HJones.doc

I have a fair amount of info on tsunami. I don't recall ever seeing a tsunami fact sheet, but could be wrong.

My suggestion, if we don't have one, is to get Henry Jones and Goutam Bagchi working on one. I lead the RES work, but can't really dig into this until tomorrow. Goutam and Henry are the two people in NRO who I work most closely with on this topic. They could give us an excellent start. Should I ask them?

BTW, there is a good (and only slightly out of date) summarization of our regulatory approach and regulatory research in an appendix on US practice that I wrote for an IAEA guide on flooding (DS417). Also, Goutam, Henry and I wrote a paper for an IAEA workshop last year.

Annie

From: Brown, Frederick
Sent: Monday, March 14, 2011 7:13 AM
To: Giitter, Joseph; Howe, Allen; Hiland, Patrick; Skeen, David; Case, Michael; Ruland, William; Dudes, Laura
Cc: McDermott, Brian; Ross-Lee, MaryJane; Kammerer, Annie; Hasselberg, Rick
Subject: FW: (Action) Tsunami Fact Sheet - NUREG issued in March 2009 Link

FYI

From: King, Mark
Sent: Monday, March 14, 2011 7:08 AM
To: Thorp, John; Boger, Bruce
Cc: Brown, Frederick; Thomas, Eric
Subject: RE: (Action) Tsunami Fact Sheet - NUREG issued in March 2009 Link

We had a NUREG issued on this subject back in March 2009.

TSUNAMI HAZARD ASSESSMENT AT NUCLEAR POWER PLANT SITES IN THE UNITED STATES OF AMERICA
Click link to view: [NUREG/CR-6966]

http://pbadupws.nrc.gov/docs/ML0915/ML091590193.pdf

From: Thorp, John
Sent: Monday, March 14, 2011 6:57 AM
To: Boger, Bruce
Cc: Brown, Frederick; King, Mark; Thomas, Eric
Subject: RE: (Action) Tsunami Fact Sheet

We'll look for it; If we don't find it quickly, we'll start producing one. (Mark King, please start looking)

I take it we would define & describe the tsunami phenomena, then address which nuclear stations in the U.S. are located in areas subject to tsunami waves, and describe what we can regarding the design of plants to withstand tsunami impacts?

Thanks,

John

From: Boger, Bruce
Sent: Monday, March 14, 2011 6:48 AM
To: Thorp, John
Cc: Brown, Frederick
Subject: Tsunami Fact Sheet

I seem to recall that OpE developed a tsunami fact sheet? Should we dust it off?

Tsunami Safety Criteria and Current Site Reviews in the United States

By

Goutam Bagchi, Hosung Ahn, Henry Jones, Annie Kammerer, Richard Raione and Nilesh Chokshi

United States Nuclear Regulatory Commission

Abstract

The U.S. Nuclear Regulatory Commission (NRC) has promulgated an alternate licensing framework for early site permits (ESPs), certified reactor designs, and combined construction permits and operating licenses (COLs) as described in 10 Code of Federal Regulations (CFR) Part 52. New applicants have been using the Part 52 framework in submittals since 2003. The reactor site criteria are addressed in 10 CFR Part 100. Guidance for the public on approaches that meet NRC requirements is outlined in NRC regulatory guides. Factors to be considered when selecting the site include physical characteristics of the site including seismology, meteorology, geology, and hydrology. The NRC staff review guidance and acceptance criteria are provided in a document, "Review of Safety Analysis Reports for Nuclear Power Plants, NUREG 0800, Revised March 2007." Section 2.4 of the staff guidance in NUREG 0800 relates to hydrology and flooding design basis for a nuclear power plant.

The objective of this paper is to describe several initiatives undertaken in the U.S. to capture the lessons learned from the 2004 Indian Ocean tsunami; to describe revision of the staff guidance documented in NUREG 0800 Section 2.4.6, "Probable Maximum Tsunami Hazards" and some essential elements from Section 2.4.5, "Probable Maximum Surge and Seiche Flooding;" and to describe efforts related to the revision of the regulatory guide 1.59, "Design Basis Floods for Nuclear Power Plants." This document also describes the efforts to use the lessons and insights learned from the current site reviews.

Several coastal sites are currently under review for assessment of flood parameters associated with tsunami and hurricane (e.g. maximum and minimum surge levels, residence time, recession rate, erosion and sedimentation effects, etc.). Modeling of wave propagation and overland runup is important for these efforts. Also, tsunami and hurricane surge estimates, including consideration of site-specific long term climate change and sea level rise effects are important aspects of the assessment. At coastal sites, the effects of tsunami and hurricane should be carefully examined to determine which effect governs the site flooding hazard.

RES

Introduction

The Code of Federal Regulation Title 10, Part 100 (10 CFR Part 100) relates to Reactor Site Criteria, and Subpart A applies to applications prior to 1997 and Subpart applies to applications after 1997. The site factors that are required to be considered include geological, seismological, hydrological, meteorological and other factors. In order to expedite site selection and certification of standard reactor designs a decoupled process was incorporated in 10 CFR Part 52 of the NRC regulation. This decoupled process allows for early site permit (ESP) applications to be separate from the standard reactor certification. The ESP needs to establish site characteristics that can accommodate an envelope of plant parameters. An applicant seeking to license a nuclear power plant can then use an ESP and a certified reactor design to submit an application for a combined operating license. Although the option exists for an applicant to use a new reactor design at a brand new site or use an ESP with a new reactor design.

NRC regulation 10 CFR Part 100.20 requires adherence to a set of siting factors. Assessment activities related to these factors include the following:

- The nature and proximity of man-related hazards (e.g., airports, dams, transportation routes, military and chemical facilities) must be evaluated to establish site parameters for use in determining whether a plant design can accommodate commonly occurring hazards, and whether the risk of other hazards is very low.
- Physical characteristics of the site, including seismology, meteorology, geology, and hydrology must be identified, characterized and assessed.
- Meteorological characteristics of the site that are necessary for safety analysis or that may have an impact upon plant design (such as maximum probable wind speed and precipitation) must be identified and characterized.
- Factors important to hydrological radionuclide transport (such as soil, sediment, and rock characteristics, adsorption and retention coefficients, ground water velocity, and distances to the nearest surface body of water) must be obtained from on-site measurements. The maximum probable flood along with the potential for seismically induced floods must be estimated using historical data.

In addition to the consideration of the siting factors above, a proposed facility must include the principal design criteria. The principal design criteria establish the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety; that is, structures, systems, and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public. Appendix A to 10 CFR Part 50 specifies these general design criteria (GDC) to establish minimum requirements for the principal design criteria for water-cooled nuclear power plants similar in design and location to plants for which construction permits have been issued by the Commission. The General Design Criteria are also considered to be generally applicable to other types of nuclear power units and are intended to provide guidance in establishing the principal design criteria for such other units. GDC 2 requires appropriate consideration of the most severe

of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated. Appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena are also required.

Regulatory Guidance on Flood Hazard Determination

Regulatory Guide (RG) 1.59, "Design Basis Floods for Nuclear Power Plants" provides guidance for one acceptable method of establishing the design basis floods at a specific site and NUREG 0800, "Standard Review Plan (SRP)" provides guidance to the NRC staff on details of conducting the review and the determination of safety findings. RG 1.59 is currently being revised, and the SRP was revised on March 31, 2007.

NRC has adopted the concept of a "probable maximum event," for estimating design bases. The probable maximum event, which is determined by accounting for the physical limits of the natural phenomenon, is the event that is considered to be the most severe reasonably possible at the location of interest and is thought to exceed the severity of all historically observed events. For example, dam failures, a probable maximum flood (PMF) is the hypothetical flood generated in the drainage area by a probable maximum precipitation (PMP) event. The probable maximum storm surge is generated by the probable maximum hurricane (PMH) or the probable maximum windstorm (PMWS). These events are defined by the American National Standards Institute (ANSI) and ANS in ANSI/ANS-2.8-1992 (ANS, 1992). Similar concepts exist for a probable maximum tsunami, which is not covered in the ANSI standard. Because the PMP is a deterministic concept with no associated probability distribution, estimating the PMF also is a deterministic process.

In order to assess the design basis flood, first, for the selected site of a nuclear power plant, the causal phenomena or mechanisms that could lead to flooding should be identified. Flooding causal mechanisms refer to the set of those hydro-meteorological, geo-seismic, or structural failure phenomena (embankment, near by water control structures) that may produce a flood at or near the site. The geographical area that is relevant when determining floods at or near the site for each flooding causal mechanism should be identified. This geographical area, generally termed the vicinity of the site or site region (or just "the vicinity"), depends on the nature of the flood causal mechanism being considered. Floods generated in the vicinity because of the hydro-meteorological, geo-seismic, or structural failure may propagate to the site. For example, a PMF in a river that flows by a site may consist of the entire watershed of the river upstream of the site. For a site located near coastal regions, an ocean, or a large lake may also be subjected to tsunamis or storm surges that might propagate to the site.

An inspection of historical data may reveal the flooding causal mechanisms that should be considered for a site. For example, an inspection of air temperature data may suggest potential for formation of ice jams or dams, the subsequent collapse of which may generate a flood. More important is the need to inspect the hydrology, topography,

morphology, and geology and the presence of any water control structures in the vicinity of the site (e.g., a site located on the banks of a river should be investigated for the PMF in the river; a site that has several upstream dams should be analyzed for floods from single and cascading dam failures). Typically, flooding causal mechanisms that should be considered include local intense precipitation, flooding in rivers and streams, flooding from upstream dam breaches or failures, flooding from storm surges or seiches, flooding from tsunamis, flooding from ice-induced events, and flooding from channel diversions towards the site. A hierarchical hazard assessment starts with the most conservative simplifying assumptions that maximize the hazards from the probable maximum event for each natural flooding causal phenomenon expected to occur in the vicinity of a proposed site. If the site is not inundated by floods from any of the phenomena, a conclusion that the site is not susceptible to flooding would be valid (ANS, 1992), and no further flood hazard assessment is needed. For these reasons, the SRP emphasizes the need to apply a hierarchical approach for establishing the design basis flood.

U. S. Tsunami Initiatives Post-2004 Indian Ocean Tsunami

In response to the 2004 Indian Ocean tsunami, in 2005 the NRC coordinated a tsunami safety study with the National Tsunami Safety initiative conducted by the National Oceanic and Atmospheric Administration (NOAA). The NRC tsunami hazard study was conducted by the Pacific Northwest National Laboratory and the Pacific Marine and Environmental Laboratory which is a part of NOAA. This early effort resulted in the publication of two documents. They were NUREG-CR 6966, "Tsunami Hazard Assessment at Nuclear Power Plant Sites in the Untied States of America", which was published in final form in March 2009, and NOAA Technical Memorandum OAR PMEL-136, "Scientific and Technical Issues in Tsunami Hazard Assessment of Nuclear Power Plant Sites,", which was published in 2007. These documents form the basis of the 2007 tsunami-related updates to NUREG 0800.

In 2006, the NRC also initiated a long-term research tsunami research program. This program, which includes cooperative work with the United States Geological Survey (USGS) and the National Oceanic and Atmospheric Administration (NOAA), was designed both to support activities associated with the licensing of new nuclear power plants in the U.S and to support development of new regulatory guidance. This research program has resulted in several publication and made important contributions to tsunami modeling approach and standards, as summarized in conference papers by Kammerer (2008)

Necessarily, the US NRC research program includes assessment of both seismic- and landslide-based tsunamigenic sources in both the near and the far fields. The inclusion of tsunamigenic landslides, an important category of sources that impact tsunami hazard levels for the Atlantic and Gulf Coasts, is a key difference between this program and most other tsunami hazard assessment programs that existed at the time. The initial phase of work undertaken by the USGS as part of the research program consisted of collection, interpretation, and analysis of available offshore data, with significant effort focused on characterizing offshore near-field landslides and analyzing their tsunamigenic potential

and properties. This work is summarized in ten Brink et al (2008). In addition, eight papers have been published in a special edition of Marine Geology Marine Geology Special Issue: Tsunami Hazard Along the U.S. Atlantic Coast, Volume 264, Issues 1-2, (2009) dedicated in whole to the results of the NRC research program. These papers are listed in the reference section of this document.

In the current phase of research, additional field investigations are being conducted in key locations of interest and additional analysis of the data is being undertaken. Simultaneously, the MOST tsunami generation and propagation model used by NOAA has been enhanced to include landslide-based initiation mechanisms and is being used to investigate the impact of the tsunamigenic sources identified and characterized by the USGS. The potential for probabilistic tsunami hazard assessment will also be explored in the final phases of the program.

Regulatory Guide 1.59 (1977) briefly discussed tsunami as a source of flooding. This regulatory guide is currently being updated. However, the update of this guide will not include tsunami-induced flooding. NRC staff is currently preparing a new regulatory guide focused on tsunami hazard assessment and risk.

U. S. Storm Surge Initiatives Post-2005 Hurricane Katrina

At the end of August 2005, Hurricane Katrina made landfall near the Louisiana/ Mississippi border. Less than one month later, Hurricane Rita struck near the Louisiana/Texas border. Both of these storms produced catastrophic damage, and areas of the Louisiana and Mississippi coasts were devastated. NRC tasked the U.S. Army Corps of Engineers (USACE) to review the NOAA Technical Report NWS 23, "Meteorological Criteria for Standard Project Hurricane and Probable Maximum Hurricane Wind Fields, Gulf and East Coasts of the United States" and the NRC Regulatory Guide 1.59, "Design Basis Floods for Nuclear Power Plants". Regulatory Guide 1.59 and its supporting documents provide a methodology for estimating the probable maximum surge (PMS) for open coast locations of the Atlantic and Gulf of Mexico. The PMS estimates are determined by use of the probable maximum hurricane (PMH) parameters applied as input to a quasi-two-dimensional numerical storm surge model developed in the early 1970s. The PMH is a hypothetical hurricane having a combination of characteristics that give the highest sustained wind speed that can probably occur at a specified location.

In 2009, the Engineer Research and Development Center, Corps of Engineers Coastal and Hydraulics Laboratory (ERDC CHL) recommended that both the NWS Report 23 and Regulatory Guide 1.59 be updated. The meteorological criteria for the PMH wind fields are developed in the NOAA Technical Report NWS 23 published in September 1979. However, additional information from the many sources which were unavailable at the time of that study, along with data from many well-documented storms since 1979, have shown some potentially important inconsistencies between the PMH derived in that study and current understanding of the characteristics of intense hurricanes. Similarly, the two-dimensional storm surge model developed in 1971 is extremely limited by restrictions and simplifications made in order to make the problem computationally tractable given

the computer resources available in the early to mid 1970's. The model assumptions and simplifications reduce the applicability and accuracy of the model.

Based on new theoretical concepts and data, NRC has continued its strong collaboration with NOAA and USACE with the ultimate objective to transition storm surge regulatory guidance to a more risk-informed methodology (1) by accounting for annual probabilities of exceedance of joint wind speed/storm surge events, and (2) by considering the effects of topography and bathymetry at the sites of interest, as the storm surge at any specific location is highly dependent upon these factors. In general, the methodology involves the simulation and selection of a stochastic set of storm tracks (synthetic approach), integration of the selected storm tracks into a hydrodynamic simulation model to generate time histories of wind speeds and corresponding time histories of storm surge heights at a site, and the application of probabilistic methods to develop joint probabilities of exceedance and mean recurrence intervals for wind speed/storm surge height events.

Limited observed data and the scale and extent of coastal storm surges have defeated attempts to characterize them by a statistical analysis of direct measurements. Thus, it is necessary to perform simulation studies using knowledge of the local climatology combined with numerical models capable of accurately simulating storm surges throughout the coastal zone. The current state-of-the-art uses the Empirical Simulation Technique (EST) and Joint Probability Method (JPM). The EST method utilizes historic data to generate a large number of multi-year simulations of possible future storm events for a specific location. The approach is based on resampling and interpolation of data contained in a database of events derived from historic events. The ensemble of simulations is consistent with the statistics and correlations of past storm activity at the site, but allows for random deviations in behavior that are likely to occur in the future. The JPM method considers all possible combinations of storm characteristics at landfall, calculates the surge effects for each combination, and then combines these results considering the combinations' associated probabilities. The result is the annual probability of exceeding any desired storm stage. Both the EST and JPM methods have become the standard approach for the evaluation of surge inundation from tropical cyclones.

EST and JPM schemes have been developed and applied in recent probabilistic hurricane-studies performed by teams led by NOAA and by USACE for the central Gulf of Mexico coast. An empirical simulation technique for modeling the entire tracks of tropical cyclones was first published by Vickery, et al. (2000a) and used to determine hurricane wind speeds and storm surge for the Gulf of Mexico and Atlantic coasts for the NRC. The surge model used in the Vickery study was the NOAA standard storm surge model SLOSH (Sea, Lake and Overland Surges from Hurricanes). The USACE has an ongoing study for the Gulf of Mexico coast using the JPM method and ADCIRC (Advanced Circulation) storm surge model to refine the physics of the processes that contribute to storm surge (Resio and Westerink, 2008).

The Great Lakes and climate change remain challenges. Although the EST method is applicable to extratropical storms, more research will be required to update guidance for

future NRC nuclear power plant sites located on the Great Lakes. Current guidance for extratropical storm surge is defined by the American National Standards Institute (ANSI) and ANS in ANSI/ANS-2.8-1992 (ANS, 1992). Similar to tropical cyclones, PMS estimates are determined by use of the probable maximum storm (PMS) parameters applied as input to a quasi-two-dimensional numerical storm surge model developed in the early 1970s. Site-specific flooding analyses from PMS is carried out by using qualified and benchmarked wave run models based on detailed flow channel cross sections and contours. In regard to climate change, since the statistics, and thus the risks of certain surge heights, depend on the storms, any change in storm intensities will lead to a change in storm surge heights. While mean sea level is expected to rise, storms may become in some regions more frequent and violent, while in others less so. This remains an area of intense scientific scrutiny. When any significant change becomes evident, the NRC has regulatory measures available to implement changes, if necessary for adequate protection of public health and safety.

Current Reviews for Coastal Sites

There are several coastal sites that are currently in review. Section 2.4.6 of the Final Safety Analysis Report (FSAR) for COL applications includes the description of PMT, historical tsunami record, source generator characteristics, tsunami analysis, tsunami water levels, hydrography and harbor or breakwater influences on tsunami, and effects on safety-related facilities. FSAR are produced by each licensee and submitted to the US NRC.

The NRC staff bases the PMT for the costal sites on the historical record of tsunamis and previously published tsunami assessments for the Gulf of Mexico or the Atlantic Ocean. Wave heights from offshore landslide sources were considered in the establishment of the PMT.

The NRC staff then establishes a maximum water level at the site of interest, by applying a runup amplification factor and taking into account 10% exceedance spring high tide and global sea-level rise within the next century. The staff determines whether the estimated PMT will not affect safety-related facilities at the proposed site or not based on the maximum on-site surge level. If affected, the staff proposes flood protection measures in FSAR Section 2.4.10. If the tsunami forces or erosion is of concern, the staff recommends sea walls or wave break structures. If the site flooding is of concern, then external flood protections\measures are necessary for plant safety.

Historical and/or Paleo Tsunami

The staff examines published information to determine the source characteristics for several different types of potential tsunamis sources: seismogenic, volcanogenic, and landslide generated. Both far-field seismogenic sources and near-field submarine and above ground landslide sources as potential generators for the PMT are considered. After reviewing published and internet-based tsunami catalogs, databases, and historical accounts, the staff identifies historical tsunami events for the site of interest.

The application should address any evidence of paleo-tsunami deposits in the FSAR. For example for South Texas site in the USA, a deposit located in Falls County, Texas near the Brazos River was originally interpreted as caused by a paleo-tsunami. The common interpretation of this deposit is that it was emplaced by a tsunami generated from Chicxulub asteroid impact, owing to its date and the existence of impact ejecta at the Brazos site. Researchers suggested that a tsunami wave 50-100 m high was necessary to explain this deposit. It appears that the wave that created these deposits was not likely to be generated by any landslide source that would be of relevance to the present-day PMT determination. Waves emanating from such a source would not have the needed extreme wave heights and long periods to be able to propagate significant wave energy far inland to a potential NPP site. The common interpretation of this deposit is that it was emplaced by a tsunami generated by the Chicxulub impact. It is unlikely, however, that the wave heights inferred from the deposit are relevant to determination of the present-day PMT at a proposed site.

Potential Tsunamigenic Sources

Potential tsunami sources that are likely to determine the PMT at the U.S. costal sites are submarine landslides, subaerial landslides, volcanogenic sources, near-field intra-plate earthquakes and inter-plate earthquakes. These sources are identified as following:. .

Subaerial Landslides: With regard to subaerial landslides, the staff looks for major coastal cliffs near the site that would produce tsunami-like waves that exceed the amplitude of those generated by other sources.

Volcanogenic Sources: The staff relies on the databases developed by either USGS, NOAA, or other government agencies (e.g. the Global Volcanism Program of the Smithsonian Institution, from*http://www.volcano.si.edu/*). Catastrophic failures associated with volcanoes along the U.S. Coasts are considered as potential tsunami sources that generate significant wave activity near the sites of interests.

Intra-Plate Earthquakes: The staff relies on the tectonic plate boundary maps in the Gulf of Mexico and Atlantic regions. Also looking are the maximum magnitude and slip of earthquakes. The staff reviews the maximum slip, and consequently the maximum sea floor displacement, associated with an earthquake scales with its magnitude to determine the initial tsunami wave amplitude associated with an intra-plate earthquake..

Inter-Plate Earthquakes: In the far-field, description of major plate boundary faults, specific source parameters, and offshore tsunami amplitudes from oceanic inter-plate earthquakes are estimated.

Local Submarine Landslides: Submarine landslides in the U.S. Coasts are considered a potential tsunami hazard for the reactor sites for two reasons: (1) some dated landslides in the region have post-glacial ages, suggesting that triggering conditions for these landslides are still present and (2) analysis of

recent seismicity suggest the presence of small-scale energetic landslides in the region.

The primary landslide parameters that are used in the tsunami wave generation models include the excavation depth, volume and slide width, which can be directly measured from sea floor mapping of the largest observed slide in the four geologic provinces. The other necessary parameter is down slope landslide length, interpreted from the runout distance. The runout distance measured from sea floor mapping is a combination of fast plug flow (low viscosity, non-turbulent), creeping plug flow (high viscosity/viscoplastic, non-turbulent) and turbidity currents (turbulent boundary layer fluid). The latter two likely have little to no tsunami-generating potential. The amplitude of the initial negative wave above the excavation region is linked to the maximum excavation depth. The amplitude of the initial positive wave above the deposition region is determined from a conservation of landslide volume. The excavation volume can be well determined using GIS techniques (see below). Setting the deposition volume equal to the excavation volume, the positive amplitude is determined for a given landslide length. For a fixed volume, increasing the landslide length decreases the initial positive amplitude of the tsunami.

Landslide volume calculations are based on measuring the volume of material excavated from the landslide source area using a technique similar to that of ten Brink and others (2006) and Chaytor and others (2009). Briefly stated, the approach involves using multibeam bathymetry to outline the extent of the excavation area, interpolating a smooth surface through the polygons that define the edges of the slide to provide an estimate of the pre-slide slope surface, and subtracting this surface from the present seafloor surface.

The maximum observed landslide from multibeam surveys is taken as the maximum landslide for a given region. It may be possible that larger landslides could occur in a given region; however this determination of the maximum landslide is consistent with the overall definition of PMT as "the most severe of the natural phenomena that have been historically reported or determined from geological and physical data for the site and surrounding area". In this case, the maximum landslide is taken from geologic observations spanning tens of thousands of years.

Seismic Seiches

Rather than being impulsively generated by displacement of the sea floor, seismic seiches occur from resonance of seismic surface waves within enclosed or semi-enclosed bodies of water. The harmonic periods of the oscillation are dependent on the dimensions and geometry of the body of water. For instance in 1964, seiches were set up along the Gulf Coast from seismic surface waves emanating from the M=9.2 Gulf of Alaska earthquake, owing in part to amplification of seismic waves from the thick sedimentary section along the Gulf Coast. Because the propagation path from Alaska to the Gulf Coast is almost completely continental and because the magnitude of the 1964 earthquake is close to the

maximum possible for that subduction zone, it is likely that the historical observations of 1964 seiche wave heights are the maximum possible and less than the PMT amplitudes from landslide sources.

Tsunami Propagation Modeling

Tsunami propagation, runup, and inundation have been computed using COULWAVE model which is a 2-dimentional non-linear wave model. At the beginning of the wave simulation, the staff used to make an initial simulation using a one-dimension wave model. The purpose of these initial simulations is to provide an upper limit of the tsunami wave height that could be generated by different landslide scenarios.

Source parameters for the simulation include landslide width, length, and excavation depth. Although landslide volume is not a direct parameter used in the model, the volumes of excavation and deposition are conserved and are used in determining the amplitude of the initial positive wave. Note that these limiting simulations use physical assumptions that are arguably unreasonable; the results of these simulations are useful to filter out tsunami sources under even the most conservative assumptions. Specifically, these assumptions are:

1. Time scale of submarine landslide motion is very small (i.e., instantaneous) compared the period of the generated tsunami
2. Bottom roughness, and the associated energy dissipation, is negligible in locations that are initially wet (i.e. locations with negative bottom elevation, offshore)

With Assumption 1, the free water surface response matches the change in the seafloor profile exactly. The landslide time evolution parameter, which is associated with a high degree of uncertainty, is thus removed. Assumption 2 prevents the use of an overly high bottom roughness coefficient, which could artificially reduce the tsunami energy reaching the shoreline. Such an assumption is too physically unrealistic to accept for the inland regions where the roughness height may be the same order as the flow depth. For tsunami inundation, particularly for inland regions such as those currently under review, the wave would need to inundate long reaches of densely vegetated land to reach the site; therefore inclusion of a conservative measure of bottom roughness is necessary in these cases.

Tsunami and Hurricane surge induced wave run-up modeling is important, since these can cause site flooding that can lead to erosion induced failure of levee/embankment etc that may be used as safety significant water control structures at the site.

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OVERVIEW OF THE U.S. NUCLEAR REGULATORY COMMISSION COLLABORATIVE RESEARCH PROGRAM TO ASSESS TSUNAMI HAZARD FOR NUCLEAR POWER PLANTS ON THE ATLANTIC AND GULF COASTS

A.M. Kammerer[1], U.S. ten Brink[2] and V.V. Titov[3]

[1] *Senior Seismologist, Office of Nuclear Regulatory Research, United States Nuclear Regulatory Commission, Washington DC, USA*

[2] *Research Geophysicist, Woods Hole Science Center, United States Geological Survey, Woods Hold MA, USA*

[3] *Chief Scientist, Center for Tsunami Research, Pacific Marine Environmental Laboratory, National Oceanic and Atmospheric Administration, Seattle WA, USA*

Email: annie.kammerer@nrc.gov

ABSTRACT :

In response to the 2004 Indian Ocean Tsunami, the United States Nuclear Regulatory Commission (US NRC) initiated a long-term research program to improve understanding of tsunami hazard levels for nuclear facilities in the United States. For this effort, the US NRC organized a collaborative research program with the United States Geological Survey (USGS) and the National Oceanic and Atmospheric Administration (NOAA) with a goal of assessing tsunami hazard on the Atlantic and Gulf Coasts of the United States. Necessarily, the US NRC research program includes both seismic- and landslide-based tsunamigenic sources in both the near and the far fields. The inclusion of tsunamigenic landslides, an important category of sources that impact tsunami hazard levels for the Atlantic and Gulf Coasts is a key difference between this program and most other tsunami hazard assessment programs. The initial phase of this work consisted of collection, interpretation, and analysis of available offshore data, with significant effort focused on characterizing offshore near-field landslides and analyzing their tsunamigenic potential and properties. In the next phase of research, additional field investigations will be conducted in key locations of interest and additional analysis will be undertaken. Simultaneously, the MOST tsunami generation and propagation model used by NOAA will first be enhanced to include landslide-based initiation mechanisms and then will be used to investigate the impact of the tsunamigenic sources identified and characterized by the USGS. The potential for probabilistic tsunami hazard assessment will also be explore in the final phases of the program.

KEYWORDS:
Tsunami, Landslide, Seismic, Hazard, Nuclear

1. BACKGROUND

In response to the 2004 Indian Ocean Tsunami, as well as the anticipation of the submission of license applications for new nuclear facilities, the United States Nuclear Regulatory Commission (US NRC) initiated a long-term research program to improve understanding of tsunami hazard levels for nuclear power plants and other coastal facilities in the United States. To undertake this effort, the US NRC organized a collaborative research program with researchers at the United States Geological Survey (USGS) and the National Oceanic and Atmospheric Administration (NOAA) for the purpose of assessing tsunami hazard on the Atlantic and Gulf Coasts of the United States. The project work described in this paper represents the combined effort of a diverse group of marine geologists, geophysicists, geotechnical engineers, and hydrodynamic modelers to evaluate tsunami sources that have the potential to impact the U.S. Atlantic and Gulf coasts.

The Atlantic and Gulf Coasts are the focus of this program, both because of the number of existing and proposed nuclear facilities located on these coasts and because many promising research efforts for assessing tsunami

hazard in the Pacific Coast of the United States are already underway as a result of programs outside the US NRC. Tsunami has been long known as a hazard in the Pacific Ocean. However, the 2004 tsunami highlighted the fact the tsunamis can occur in other oceans that are less prepared for this rare phenomenon. Although tsunami are far rarer along the Atlantic and Gulf of Mexico coastlines, some areas can be highly vulnerable to tsunamis when they do occur because major population centers and industrial faculties are located near the shoreline at low-lying elevations, and often in estuaries. This is in comparison to the Pacific coast where tsunamis are more frequent but the coastline is more sparsely populated and most sections have more topographic relief.

Because the US NRC is interested in understanding hazard associated with the rare large tsunami that may occur over long time periods (in excess of 10,000 years), the research program was developed to investigate both seismic and landslide tsunamigenic sources. It also includes the study and characterization of large sources in the far field, as well as sources in the near field such that all key sources were considered. The study of near-field and far-field tsunamigenic landslides is a key difference between this research program and other tsunami hazard assessment programs, which are typically focused on seismic sources. Although seismic sources are important on the Atlantic and Gulf Coasts, submarine landslides have also historically generated destructive tsunamis and so must be fully investigated in this program. In landslide initiated tsunami, the extent of damaging waves generated by landslides is generally smaller and more localized. However, along coastlines proximal to catastrophic submarine landslides, tsunami run-up can be significant as exemplified by the 1929 Grand Banks tsunami (Newfoundland and Nova Scotia), which likely had a significant landslide-generated component. Less is generally known about submarine landslides as tsunami triggers in comparison to their earthquake counterparts.

Although only a few years old, this research program has already produced significant results that are currently or will soon be available to the public through a variety of technical publications. These publications include a USGS report to the US NRC (Ten Brink et al, 2007) and multiple articles in a special issue of Marine Geology to be published late 2008 or early 2009 (Barkana et al; Chaytor et al; Geist et al; Lee; Locat et al; Ten Brink et al, 2008). The early research and results discussed in the USGS report were focused on providing sufficient information on the source parameters useful for qualitative assessment of tsunami hazard for the Atlantic and Gulf coasts. This information is currently being used to develop and review tsunami hazard assessments for new nuclear power facilities in the United States. A companion paper in this conference summarizes and discusses in more detail some of the early results of the US NRC program (Kammerer et al, 2008)

2. INITIAL INVESTIGATION OF NEAR-FIELD LANDSLIDE SOURCES IN THE ATLANTIC

In the initial phase of work a significant level of effort was focused on identifying and characterizing offshore near-field landslides and on understanding their regional distribution along the coasts. In this work, efforts were made to consider the impact of varying conditions, such as the effects of glacial periods and sea level changes. Once early results on the location and characterization of offshore landslides was obtained, an effort towards modeling one of the larger slides, the Currituck Slide, was initiated to better understand the tsunami hazard posed by the mapped slides. Before tsunami generation and propagation modeling of the Currituck slide could be undertaken, important properties of the slide, such as flow velocity, needed to be characterized. Work at Laval University included analysis of the dynamic elements of the Carrituck slide; and modeling of the slide was undertaken by both Texas A&M University and the USGS. A summary of each of these steps is provided below and a more complete discussion of the results of key research elements is provided in the companion paper in this conference. This early work has also been well documented in the public USGS report (Ten Brink et al, 2007).

2.1 DATA COLLECTION

The first step in the initial investigation of lanslides in the Atlantic was the collection and analysis of a large amount of available information useful for the identification and characterization of offshore landslides along the Atlantic coast of the U.S. Multibeam bathymetry, Geologic Long-Range Inclined Asdic (GLORIA) sidescan sonar imagery, a regional grid of high-resolution seismic profiles, and published accounts of sediment cores from

the region was collected (Figure 1). In addition to these data sets, a review of past work studying the geology of the offshore environment, as well as studies of offshore landslides were also collected, reviewed, and summarized. A discussion of the body of previous work is provided in the USGS report (Ten Brink et al, 2007).

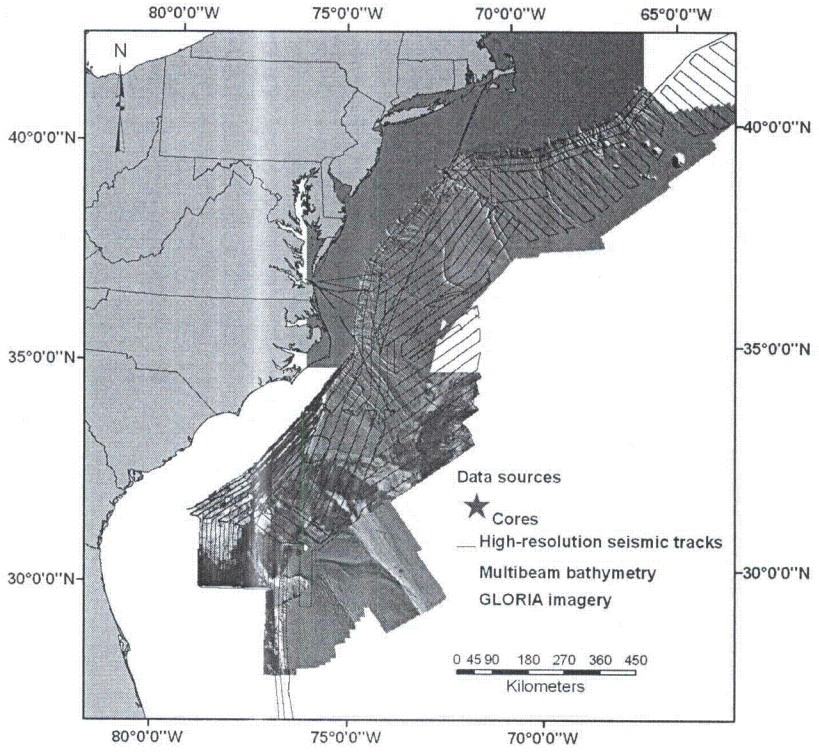

Figure 1 Data Collected for Study of Potential Tsunamigenic Landslides on U.S. Atlantic Coast

Data used in the compilation of the Atlantic coast bathymetry map used in the study were acquired from several sources and vary in age, sounding density, and positional accuracy. The primary data set was acquired by the University of New Hampshire (UNH) (Gardner et al., 2006; Cartwright and Gardner, 2005) and provides near continuous coverage of the U.S. Atlantic margin from the base of the continental slope down to the abyssal plain. These data include gridded bathymetric soundings and mosaiced acoustic backscatter. For sections of the continental slope and rise not covered by the UNH data set, several additional multibeam datasets were used. For areas in which no multibeam soundings were available, sounding data from the National Ocean Service hydrographic database and the NOAA coastal relief model provided bathymetric coverage of the continental slope. Efforts will be made to address some of these data gaps through field studies in future phases of the program. The final map developed for this project covers the ocean floor from the shoreline to depths greater than 5,000 m, between 43.5 and 24 degrees north latitude.

In addition to the acoustic backscatter data from the UNH multibeam surveys, GLORIA sidescan sonar data were used to identify and map landslide features along the U.S. Atlantic continental margin (EEZ-SCAN 87, 1991). Analogue records of 3.5-kHz seismic reflection profiles, co-acquired with the GLORIA sidescan imagery, were used to determine location, geometry, and thickness of landslide features. Although other data sets are available, the acquisition parameters and quality of these data are consistent over the entire area of study, and they provide a relatively clear picture of the upper sedimentary section.

Over 1400 cores have also been collected from the study area off the Atlantic coast, and descriptions of the cores are available. Approximately 1,000 have been visually described, and 145 of them have had general ages

assigned based on faunal content. While the descriptions provided are often brief, they provide a valuable summary of the overall lithology of many of the cores.

2.2 IDENTIFICATION AND CHARACTERIZATION OF LANDSLIDES

The volume and quality of data collected greatly assisted in mapping the distribution and style of surficial submarine landslides along the eastern U.S. margin between the eastern end of Georges Bank and the northern end of the Blake Spur. The near-complete coverage of the Atlantic continental slope and rise by multibeam bathymetry provided a key high-quality and uniform data set that allowed for a more detailed and consistent view and assessment of the geomorphology of submarine landslides than had been possible in the past.

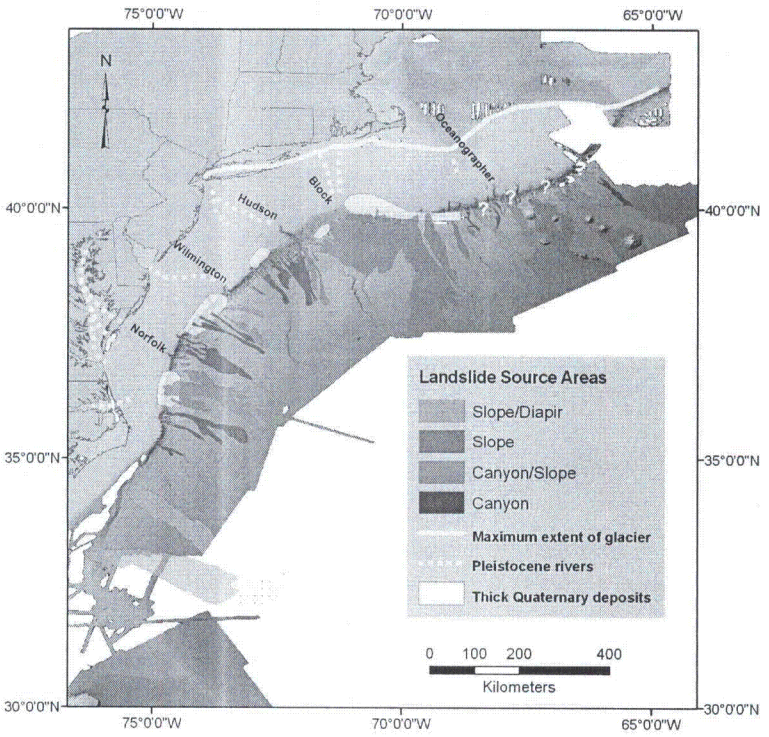

Figure 2 Initial Map of Landslide Source Areas Along the U.S. Atlantic Coast

The mapping of these landslide-affected areas was broken into several steps. The first step was to identify any scarps of significant size around and within landslide source areas. Scarps were easily identified in shaded-relief and slope maps derived from the bathymetric data. Next the areas affected by landslides were outlined. Depending on availability, a mix of shaded-relief imagery, backscatter imagery from the multibeam system, and GLORIA imagery were used. The final step was to merge the thickness information derived from subbottom profiles with the interpretation of the sea-floor imagery to distinguish the erosional and depositional sections of the landslide. The volumes of the source areas of mapped and potential slides of various sizes and differing geologic settings (e.g. submarine canyons or the open slope) were calculated.

This mapping indicates that landslides along the U.S. Atlantic margin initiate predominantly in two morphologic settings, canyon (heads and sidewalls) and on the open continental slope (Figure 2). The canyon-sourced failures often have several canyons feeding a single deposit, and the deposits are smaller than those derived from the open slope. As a result, they are unlikely to cause tsunami events. Open-slope failures commonly originate on the middle and lower slope in 800-2,200 m depths. These landslides extend farther offshore, are thicker, and have

considerably larger volumes than their canyon derived counterparts. As a result of the large volumes of material that sometimes fail, open slope-sourced slides are considered to have the most potential to initiate tsunami (Murty, 2003). However, a significant volume of material may also be mobilized in landslides associated with areas of salt diapirism as well. From the modeling of source volumes of individual scarps along the margin, we see that three regions (off Georges Bank, Currituck area, and in the Carolina Trough) have had a history of, and potential for, large volume failures. With the current data, it is difficult to determine if landslides on the southern New England slope involve large volumes of material per event, or if the region is dominated by smaller, but more numerous landslides.

2.3 CARRITUCK LANDSLIDE ASSESSMENT AND MODELING

In order to gain an initial understanding of the implications of the mapped landslides on the tsunami hazard along the Atlantic coast, a study to characterize and perform hydrodynamic modeling of the Carrituck landslide was undertaken. This work also showed the potential for the methods employed. Tsunami magnitude depends strongly upon the size of the slide and how the landslide moves as it fails and flows. Therefore, the first step was to determine the parameters needed for the tsunami generation and propagation modeling. This work had significant challenges because the initial geometry of the material was not known, it was unclear if there had been a single event or multiple events, and the properties of the geologic material were not well characterized. During this work several issues were considered and the researchers endeavored to answer the following multiple lines of inquiry. Ultimately a possible initial velocity and acceleration of the failed mass was developed from the mobility analyses.

Once estimates of the important landslide parameters had been developed, preliminary hydrodynamic modeling of the slide was conducted for the purpose of determining the range of possible near-shore wave heights and understanding the possible impact of the continental shelf. Considerations of bottom friction and non-linearity were included in this work. This study was undertaken early in the program and played an important role for the US NRC because the modeling allowed staff to understand the general implications of the initial landslide mapping results. It also helped to scope and focus the organization of the broader research program.

3. INVESTIGATION OF FAR FIELD TSUNAMIGENIC LANDSLIDES IN THE ATLANTIC

The research related to far field tsunamigenic landslides, has focused on collecting information and assessing the potential impact to the U.S. Atlantic and Gulf coasts. Numerous debris deposits from landslides have been identified in the literature along the Canadian, European and African coasts of the Atlantic Ocean and a number of possible source areas were considered in detail for this program. These areas include the Canary Islands, the Mid-Atlantic Ridge, the glaciated margins of northern Europe and Canada, the Scotia margin immediately NE of the U.S. border, the northern European margin, and the Puerto Rico trench. In many cases, evidence of tsunamis from landslides were found, although the effects were often highly localized as is common for landslide-initiated tsunami. The USGS report provides information on both historical tsunamis and proposed modeling parameters for these areas.

Perhaps the most publicized hypothesized hazard is that of a possible collapse of Cumbre Vieja, a volcano on the Canary island of La Palma (Ward and Day, 2001). As envisioned by Ward and Day, a flank collapse of the volcano may drop a rock volume of up to 500 km^3 into the surrounding ocean. The ensuing submarine slide is further hypothesized to generate a strong tsunami with amplitudes of 25 m in Florida. In the time since the initial work was published, significant work by other researchers has been undertaken to look at their assumptions. A review of all associated work was undertaken for this program and it was concluded that the danger to the U.S. Atlantic coast from the possible collapse of Cumbre Vieja is exaggerated. Mader (2001) pointed out that Ward and Day's assumption of linear propagation of shallow water waves is incorrect, because it only describes the geometrical spreading of the wave and neglects dispersion effects. A more rigorous hydrodynamic modeling by Gisler et al. (2006), confirms Mader's criticism. Their predicted wave amplitude for Florida is between 1 and 77

cm. A fuller discussion is provided in the USGS report and the potential impact of a collapse of Cumbra Vieja will be further studies by NOAA as part of this project.

4. INITIAL INVESTIGATION OF TSUNAMIGENIC LANDSLIDES IN THE GULF OF MEXICO

This project has also started investigating the potential for tsunamigenic landslides in the Gulf of Mexico. The Gulf of Mexico is a small, geologically diverse ocean basin that includes three distinct geologic provinces: a carbonate province, a salt province, and canyon to deep-sea fan province. Currently the work in this area is not as advanced as the assessment in the Atlantic. However, early work investigating landslides undertaken by this project and others that indicates that submarine landslides have occurred in each of the three provinces, although they vary in style and size among these different provinces. Landslides also have been shown to be active throughout much of the history of this basin, including in the Quaternary Period, up to the present. Submarine landslides have been studied in the Gulf of Mexico in the past for two reasons: first they can pose a hazard to offshore platforms and pipelines and second, when more deeply buried they can serve either as hydrocarbon reservoirs or barriers in reservoirs depending on their composition. The threat of submarine landslides as a generator of tsunamis has not previously been addressed for the Gulf of Mexico region. However, the existing literature describing the distribution and style of submarine landslides that have occurred in the Gulf of Mexico during the Quaternary has been reviewed for this program and is summarized in the USGS report. The review focused on landslides that have occurred in on the continental slope and rise in the Gulf of Mexico; with much of the discussion focused on the part of the basin within the U.S. Exclusive Economic Zone (EEZ) due to the availability of a greater number of publications from this region. Research is on-going in this area.

5. IDENTIFICATION AND CHARACTERIZATION OF SEISMIC SOURCES THAT MAY IMPACT THE ATLANTIC OR GULF COASTS

5.1 Sources in the Atlantic Ocean

Earthquake-generated tsunamis generally originate by the sudden vertical movement of a large area of the seafloor during a large magnitude earthquake. Such movement is generated by reverse or thrust faulting, most often in subduction zones. The Atlantic Ocean basin is generally devoid of subduction zones or potential sources of large reverse faults. The two exceptions are the Hispaniola-Puerto Rico-Lesser Antilles subduction zone, where the Atlantic tectonic plate subducts under the Caribbean plate, and the enigmatic zone of large earthquakes west of Gibraltar. These two earthquake source areas were investigated, an evaluation of their tsunamigenic potential was undertaken, and the potential for impact to the U.S. coastline by resulting tsunami was considered.

Four large tsunamigenic earthquakes have occurred in the Atlantic Ocean west of Gibraltar in the last 300 years. However, there is no simple tectonic model for this area that explains the generation of these earthquakes. As a result, promising work undertaken to determine the source parameters of the 1755 Lisbon earthquake is of particular interest. A variety of past studies have hypothesized various sources for this earthquake, which is known to have caused a tsunami around much of the Atlantic Ocean. However, prior to this project there had not been an attempt to fit cross-ocean tsunami reports of the 1755 Lisbon earthquake to any of the proposed fault sources. As part of this program, modeling of various sources is being undertaken to try to determine a viable source location and geometry that predicts the many records of tsunami impacts from the earthquake.

5.2 Sources in the Caribbean

The 2004 magnitude 9.2 Sumatra-Andaman earthquake was a surprise from a geologic and tectonic perspective in that it occurred along a highly oblique subduction zone, where the convergence rate is low, and where very large earthquakes were thought unlikely to occur. Many of the tsunamigenic fault zones in the Caribbean and

Atlantic are characterized by similar tectonics and may have higher hazard than has been previously predicted. In particular, a major concern was raised about the Puerto Rico trench, because a tsunami initiating here has a potential impact on the U.S. East Coast. The USGS has recently carried out extensive fieldwork in the Puerto Rico trench to understand the tectonics of the area. As a result, researchers on the US NRC project were able to rapidly provide an evaluation for this source. As part of this analysis, tsunami propagation from several different large-magnitude earthquakes in the Caribbean was modeled to estimate deep ocean tsunami amplitudes offshore U.S. Atlantic and Gulf coasts. A range of tsunami amplitudes is determined based on natural variations in slip distribution patterns expected for large magnitude earthquakes along plate boundaries in the Caribbean. This work is ongoing and has been useful for providing general hazard information to the US NRC.

A series of large earthquakes with mostly thrust motion took place in the eastern half of northern Hispaniola between 1946 and 1953. One of the events in 1946 was accompanied by a destructive local tsunami. In contrast to the Puerto Rico trench, a larger vertical motion is expected for a given magnitude of slip on portions of the Hispaniola trench. It is unclear, whether the western part of the subduction zone would rupture in a single earthquake and how far west the rupture would extend. Modeling is needed to determine if the U.S. Atlantic coast would be protected from tsunamis generated in this subduction zone by the Bahamas banks which are near sea level and act as obstructions to tsunami wave propagation.

5.2 Sources in the Gulf of Mexico

The Gulf of Mexico basin is devoid of subduction zones or potential sources of large reverse faults. However, the Caribbean basin contains two convergence zones whose rupture may affect the Gulf of Mexico, the North Panama Deformation Belt and the Northern South America Convergent Zone. Hydrodynamic modeling is needed to evaluate the role of the Yucatan straits (between Cuba and the Yucatan Peninsula) in modifying the propagation of tsunamis into the Gulf of Mexico, though some initial modeling hs been initiated.

6. UPCOMING ACTIVITIES

As part of the second phase of the program, which is currently underway, the USGS will conduct field investigations in key locations for the purpose of obtaining new data useful for determining tsunami hazard assessment of nuclear facilities. The USGS is also continuing investigations into assessing landslide potential in the Gulf of Mexico, determining the source of the 1755 Lisbon earthquake, and a variety of other topic of interest.

Simultaneously, the MOST tsunami generation and propagation model used by NOAA is currently being enhanced to include landslide-based initiation mechanisms and is being validated with case studies, including the 1958 Lituya Bay megatsunami. The enhanced MOST model will be used to investigate the tsunamigenic sources identified and characterized by the USGS, with the goal of creating an estimation of deterministic tsunami hazard levels for the full length of Atlantic and Gulf Coasts. This information may ultimately be developed into a map of deterministic tsunami hazard for these coastlines and will be of direct benefit to the US NRC efforts to assess tsunami hazard at coastal facilities.

The potential for developing tools and data to undertake probabilistic tsunami hazard assessments (PTHA) will also be a key focus of later phases of the research program. PTHA will require an understanding of the frequency of different initiating events. Some areas in which the US NRC is likely to initiate additional work in the coming years relates to understanding the timing of the submarine landslides identified in the Atlantic. One example is careful age dating on cores recovered from within and adjacent to mapped landslides. In the companion paper in this conference, information on the result of ongoing work, some of which is leading to PTHA is provided.

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Summary of Current Regulations, Guidance, and Activities related to NRC Review of Tsunami Hazard Analyses for New NPPs in the United States

The United States Nuclear Regulatory Commission (NRC) considers and assesses tsunami and tsunami-like phenomena under its tsunami hazard and risk assessment protocols. To perform a tsunami hazard and risk assessment, the NRC uses a hierarchical framework and a variety of technical approaches as appropriate for each of the various source types. Currently NRC guidance on tsunami uses a deterministic approach based on assessment of the Probable Maximum Tsunami (PMT). This annex describes the current approach NRC staff use in the review of license applications.

The NRC is moving towards risk-informed approaches and guidance across the agency. Probabilistic approaches can be proposed as a basis for review by the licensee. Current state-of-the-art practice in the U.S. uses probabilistic approaches to determine tsunami hazard on the Pacific coast. Probabilistic tsunami hazard assessment (PTHA) methods are an area of active research within the NRC and are currently viable on the Pacific coast. Currently a lack of information on the rate of activity of tsunamigenic sources that may affect the Atlantic and Gulf Coasts of the U.S. preclude the practical use of probabilistic methods.

Regulations and Regulatory Guidance

NRC regulations related to tsunami hazard assessments, as provided in the Code of Federal Regulations (CFR), include the following:

1. 10 CFR Part 100, as it relates to identifying and evaluating hydrological features of the site. The requirements to consider physical site characteristics in site evaluations are specified in 10 CFR 100.20(c) for new applications.

2. 10 CFR 100.23(d) sets criteria to determine the siting factors for plant design bases with respect to seismic induced floods and water waves at the site.

3. 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 2, for CP and OL applications, as it relates to consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated.

4. 10 CFR 52.17(a)(1)(vi), for early site permit (ESP) applications, and 10 CFR 52.79, for combined operating licenses (COL) applications, as they relate to identifying hydrological site characteristics with appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated.

Regulatory Guide 1.59 (1977) briefly discussed tsunami as a source of flooding. This regulatory guide is currently being updated. However, the update of this guide will not include tsunami-induced flooding. NRC staff is currently preparing a new regulatory guide focused on tsunami hazard assessment and risk.

Section 2.4.6 of the NRC Standard Review Plan (SRP) NUREG 0800 (NRC, 2007) describes review procedures and acceptance criteria for tsunami hazards currently used by NRC staff.

The National Oceanic and Atmospheric Administration (NOAA) is responsible for developing standards of accuracy for tsunami simulation models for the U.S. federal government and for conducting research to support the National Tsunami Hazard Mitigation Program. In 2007, NOAA provided the NRC with a state-of-the-art report on tsunami hazard assessment in the U.S. which, along with NUREG/CR-6966, forms the basis for the current NRC review approach.

In 2006, the NRC initiated a long-term research tsunami research program. This program, which includes cooperative work with the United States Geological Survey (USGS) and the National Oceanic and Atmospheric Administration (NOAA), was designed both to support activities associated with the licensing of new nuclear power plants in the U.S and to support development of new regulatory guidance.

Additional supporting documentation is available as described in the sections below.

The Application of the Hierarchical Approach

A hierarchical approach acceptable to NRC staff is described in NUREG/CR-6966. As noted in this document, a hierarchical-assessment approach consists of a series of stepwise, progressively more refined analyses that are used to evaluate the hazard resulting from a specific phenomenon. In the case of tsunami, this approach is defined by three steps that answer the following questions:

1. Is the site region subject to tsunamis?
2. Could the plant site be affected by tsunamis?
3. What is the risk to safety of the plant caused by tsunamis?

The first step, which is essentially a regional screening test, is performed to determine whether or not a site can be screened out based on its proximity to a water body capable of producing a tsunami or tsunami-like effect. If the region in which a site is located is not subject to tsunamis, no further analysis for tsunami hazards is required. This finding should be supported by region-specific evidence. If this cannot be conclusively shown, the second step, below, is required.

The second step can be regarded as a site-screening test. This step determines whether plant systems important to safety are exposed to hazards from tsunami. The methods used to perform site-specific hazard assessments, including the calculation of site-specific

run-up elevations, are described later in this Annex. It may be possible to determine that, even though the general site region is subject to tsunami hazards, all safety-related systems are located at an elevation above the calculated maximum wave run-up.

The third step assesses the risk to a facility that may exist if the elevation of the safety-significant structures, systems and components (SSC) cannot be conclusively shown to exceed the calculated tsunami run-up. This step requires the most refined and complex analysis.

Areas of Review by NRC Staff

NRC Staff review the technical areas summarized below. These review areas are described in more detail in the current version of the NRC SRP (NUREG 0-800), which is available for download at the NRC's online reading room.

1. Historical Tsunami Data. The staff reviews historical tsunami data, including paleotsunami data. Historical data may help in establishing the frequency of occurrence and other useful indicators such as the maximum observed run-up height. The NOAA National Geophysical Data Center collects and archives information on tsunami sources and effects to support tsunami modeling and engineering for the U.S. government and should be used as a key source of data. International sources that are relevant to plants exposed to trans-oceanic tsunami should also be investigated.

2. Probable Maximum Tsunami. Currently, NRC staff reviews applications for adequacy based on deterministic assessment of a Probable Maximum Tsunami (PMT), as noted in Regulatory Guide 1.59 (1977). The staff reviews the PMT with respect to the identification of the source mechanisms, the characteristics of these source mechanisms, and the simulation of the wave propagating towards the proposed plant site. A discussion of tsunamigenic sources is provided later in this Annex.

3. Tsunami Propagation Models. The staff reviews the computation models used in the hazard analysis. Elements of tsunami modeling are discussed in more detail later in this Annex.

4. Wave Run-up, Inundation, and Drawdown. The staff reviews the run-up caused by the PMT. An appropriate initial water surface elevation for the body of water under consideration, before the arrival of the tsunami waves, should be assumed. similar to that recommend for storm surges and seiches by ANSI/ANS-2.8-1992. For example, to estimate the highest tsunami wave run-up at a coastal site, the 90^{th} percentile of high tides must be used as the initial water surface elevation near the site. To estimate the lowest drawdown caused by receding tsunami waves, the 10^{th} percentile of the low tides may be used

Any inundation indicated by the assessment should be considered in the flooding design bases of the plant and may necessitate flooding protection for some safety-related SSC. Staff also reviews drawdown caused by tsunami waves and how it may affect the safety-related intakes, if they are used in the plant design and are exposed to the effects of the tsunami. The staff also reviews the duration of the drawdown to estimate the time during which a safety-related intake may be affected. The suggested criteria of Regulatory Guide 1.27 apply when the water supply comprises part of the ultimate heat sink.

It should be demonstrated that the extent and the duration of the inundation and the drawdown caused by the tsunami waves are adequately established for the purposes of the plant design bases.

5. Hydrostatic and Hydrodynamic Forces. The staff reviews the hydrostatic and the hydrodynamic forces on the safety-related SSC caused by the tsunami waves. Because the tsunami occurs as a train of waves, several incoming and receding wave cycles should be considered. Local geometry and bathymetry can significantly affect the height, velocity, and momentum flux near the locations of the safety-related SSC. The suggested criteria of Regulatory Guide 1.26 apply when the water supply comprises part of any water-cooled ultimate heat sink.

   It should be demonstrated that hydrostatic and hydrodynamic forces caused by the tsunami waves are adequately established for the purposes of the plant design bases.

6. Debris and Water-Borne Projectiles. The staff reviews the likelihood of debris and water-borne projectiles carried along with the tsunami currents and their ability to cause damage to the safety-related SSC. The suggested criteria of Regulatory guide 1.27 apply when the water supply comprises part of the ultimate heat sink. It should be demonstrated that any possibility of damage to the safety-related SSC from debris and water-borne projectiles is adequately established for the purposes of the plant design bases.

7. Effects of Sediment Erosion and Deposition. The staff reviews the sediment deposition during the tsunami, as well as the erosion caused by the high velocity of flood waters or wave action during the tsunami and its effect on foundations of the safety-related SSC, to ensure that these are adequately established for the purposes of the plant design bases. Any potential erosion and sediment deposition should not affect safety-related functioning of the exposed SSC. The suggested criteria of Regulatory Guide 1.27 apply when the water supply comprises part of the ultimate heat sink.

8. Consideration of other Site-Related Evaluation Criteria. 10 CFR Part 100 describes site-related proximity, seismic and non-seismic evaluation criteria for power reactor applications. Subpart A to 10 CFR Part 100 addresses the requirements for applications before January 10, 1997, and Subpart B is for

applications on or after January 10, 1997. The staff's review will include evaluation of pertinent information to determine if these criteria are appropriately used in postulation of worst-case tsunami scenarios.

Tsunamigenic Source Characterization

Tsunami hazard along the United States coastlines comes from two predominant source categories; landslides and seismic sources. Sources in these categories exist in both the near- and far-field. A regional assessment of tsunamigenic sources should be carried out to determine all sources that may generate the PMT at the proposed plant site. The source mechanisms considered in the assessment should include earthquakes, submarine and sub-aerial landslides and volcanoes. The characteristic of the sources that are used for the specification of the PMT should be conservative.

The landslide sources should be characterized using the maximum volume parameter determined from seafloor mappings or geologic age dating of the historical landslides. A slope-stability analysis should be performed to assess the potential tsunami generation efficiency of the candidate landslides. The tsunamigenic source types caused by volcanic activity considered in the PMT assessment should include pyroclastic flows, submarine caldera collapse, explosions, and debris avalanches or flank failures.

To support license activities related to new reactors, the NRC has initiated a long-term tsunami research program. As part of this program, the United States Geological Survey (USGS) has provided a report summarizing the tsunamigenic source mechanisms in the Atlantic Ocean and the Gulf of Mexico (ten Brink et al 2008). The sources detailed in this report are used by the NRC staff as a starting point for tsunami assessment for proposed sites located near these water bodies. Research is on-going in this area and additional references and source characterizations may become available in the future.

Tsunami Modeling Methods

As part of the licensing process, the staff reviews the computational models used in the tsunami hazard analyses. Tsunami propagation models should be used, such as those used by NOAA that are published in peer-reviewed literature and are verified using extensive testing.

The staff reviews propagation of the PMT waves from the source towards the proposed site. If appropriate, the shallow water wave approximate should be used to simulate propagation of the PMT waves in deep waters. The simulation of the propagation of the PMT waves in shallow waters, where the shallow water wave approximation is not valid, should use non-linear wave dynamics approaches.

The staff reviews the model parameters and the input data used to simulate the propagation of the PMT waves towards the site. The model parameters should be

described and their conservative values should be chosen. All other data used for model input should be described and their respective sources noted. Usually bathymetry and topography data archived and maintained by NOAA/NGDC, and the USGS, and the U.S. Army Corps of Engineers are sufficient for sites in the U.S. However, some sites may require additional data.

NOAA has the responsibility to develop standards of accuracy for tsunami simulation models for the U.S. federal government and to conduct research to support the National Tsunami Hazard Mitigation Program. NOAA, through USAID funding, has developed an interface tool, the Community Model Interface for Tsunami (ComMIT), that allows individuals and institutions to make use of NOAA seismic source models, tools, and results. This publically-available interface tool, when applied by an appropriately trained analyst and coupled with high-quality local bathymetric information, is a useful tool to undertake tsunami hazard analyses at many locations both within and outside the U.S. It is highly recommended than any analyst using the tool should first perform the benchmark test problems provided on the NOAA website.

The NRC intends to use the NOAA ComMIT tool, as appropriate, and will continue to work with NOAA to enhance NRC practices and guidance in the future. For landslide-related tsunamigenic sources alternate methods and tools are required. Development of guidance on landslide-based tsunami modeling is ongoing.

References for Annex:

The below references are available either through the NRC ADAMS system using the ML ascension number (if shown), or through the NRC reading room. Both can be accessed through the NRC website located at http://www.nrc.gov

10 CFR Part 50. Code of Federal Regulations. Title 10, Energy, Part 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR Part 52. Code of Federal Regulations. Title 10, Energy, Part 52 "Early Site Permits; Standard Design Certifications; and Combined License for Nuclear Power Plants."

10 CFR Part 100. Title 10, Energy, Part 100, "Reactor Site Criteria."

ANSI/ANS-2.8-1992, "Determining Design Basis Flooding at Power Reactor Sites" (not available at NRC site)

Gonzalez, F.I., Bernard, E., Dunbar, P., Geist, E., Jaffe, B., Kanoglu, U., Locat, J., Mofjeld, H., Moore, A., Synolakis, C., and Titov, V., (2007), "Scientific and Technical Issues in Tsunami Hazard Assessment of Nuclear Power Plant Sites," NOAA Technical Memorandum OAR PMEL-136, Pacific Marine Environmental Laboratory, National Oceanic and Atmospheric Administration, Seattle, Washington.

NOAA National Geophysical Data Center (NGDC), (2007) NOAA/WDC Historical Tsunami Database at NGDC, URL: http://www.ngdc.noaa.gov/hazard/tsu_db.shtml

NOAA Community Model Interface for Tsunami (ComMIT) download and documentation are available at http://nctr.pmel.noaa.gov/ComMIT/

Pacific Northwest National Laboratory (2009), "Tsunami Hazard Assessment at Nuclear Power Plant Sites in the United States of America." NUREG/CR-6996, PNNL-17397. Available for download at the NRC reading room.

Ten Brink, U.S, Twitchell, D., Geist, E.L., Chaytor, J., Locat, H., Lee, B., Buczkowski, B., Barkan, R., Solow, A., Andrews, B., Parsons, T., Synett, P., Lin, J., and M. Sansoucy Atlantic and Gulf of Mexico Tsunami Hazard Assessment Group (2008), "Evaluation of Tusnami Sources with the Potential to Impact the U.S. Atlantic and Gulf Coasts: An Updated Report to the Nuclear Regulatory Commission," U.S. Geological Survey Administrative Report, Woods Hole, Massachusetts. (ML082960196)

U.S. Nuclear Regulatory Commission (1977), "Design Floods for Nuclear Power Plants." Regulatory Guide 1.59, Washington, D.C.

U.S. Nuclear Regulatory Commission (1976), "Ultimate Heat Sink for Nuclear Power Plants." Regulatory Guide 1.27, Revision 2, Washington, D.C.

U.S. Nuclear Regulatory Commission (2007), "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," LWR Edition, Office of Nuclear Reactor Regulations, Washington, D.C.

Satorius, Mark

From: Satorius, Mark
Sent: Tuesday, March 15, 2011 4:45 PM
To: Boland, Anne; Pederson, Cynthia; Shear, Gary; Louden, Patrick; Reynolds, Steven; West, Steven
Subject: FW: Industry Efforts

fyi

From: Boger, Bruce
Sent: Tuesday, March 15, 2011 4:04 PM
To: Leeds, Eric; Grobe, Jack; Ruland, William
Cc: Dean, Bill; Lew, David; McCree, Victor; Wert, Leonard; Satorius, Mark; Pederson, Cynthia; Collins, Elmo; Howell, Art; Virgilio, Martin; Thomas, Eric; Brown, Frederick
Subject: Industry Efforts

I spoke with Randy Edington (CNO Palo Verde) and later with Steve Nichols (INPO) regarding industry actions as a result of the situation in Japan. The CNOs teleconferenced over the weekend and agreed to a series of near-term actions. 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, SAMGs, mitigation of SBO conditions, mitigation of internal and external flooding, and fire and flooding events that could be impacted by a concurrent seismic event. This should help shape the generic communication we've been discussing. INPO is figuring out how quickly they will be able to share the report with us. The report won't be available to the public, but we can share it internally.

w/83

Satorius, Mark

From: Chandrathil, Prema
Sent: Tuesday, March 15, 2011 1:02 PM
To: Satorius, Mark; Pederson, Cynthia; West, Steven; Shear, Gary; Reynolds, Steven; OBrien, Kenneth; Boland, Anne; Louden, Patrick; Holt, BJ; Sotiropoulos, Dina; Langan, Scott
Cc: Heck, Jared; Logaras, Harral; Barker, Allan; Mitlyng, Viktoria
Subject: FW: NRC Talking Points on Japan Earthquake and Tsunami

ALL—
Please forward to your staff the talking points in this email and the previous email below. Please encourage your staff to look at the NRC press releases. Staff can use the information in the press release as well to talk from if they get questions. http://www.nrc.gov/reading-rm/doc-collections/news/2011/

A couple of the key headlines in the press releases:

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 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.

NRC see no radiation at harmful levels reaching the U.S. from damaged Japanese plants

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From: Chandrathil, Prema
Sent: Friday, March 11, 2011 10:11 AM
To: Satorius, Mark; Pederson, Cynthia; West, Steven; Shear, Gary; Reynolds, Steven; OBrien, Kenneth; Boland, Anne; Louden, Patrick; Holt, BJ; Sotiropoulos, Dina
Cc: Mitlyng, Viktoria; Heck, Jared; Logaras, Harral; Barker, Allan
Subject: NRC Talking Points on Japan Earthquake and Tsunami

ALL:

In response to the events in Japan and the West Coast **please feel free to forward any inquiry you get to your PAO's here in the region**. We are prepared to respond to any inquiries with agency key messages. Below are some very basic talking points but please remembers we **DO NOT** want to get out in front of our Japanese counterparts concerning the events outside of the United States. Please forward this message to NRC employees who may need this information.

Thanks,
Prema

If you do get any calls – here are some basic talking points but feel free to send them my way.

W/84

The Nuclear Regulatory Commission is following events on the U.S. West Coast and U.S. Pacific interests in the wake of the March 11 earthquake in Japan and associated tsunami.

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, the licensing bases for existing nuclear power plants are based on historical data from the area's maximum credible earthquake, with an additional margin included.

The Nuclear Regulatory Commission is following events on the U.S. West Coast and U.S. Pacific interests in the wake of the March 11 earthquake in Japan and associated tsunami.

The tsunami is expected to miss NRC-regulated nuclear materials sites in Hawaii and Alaska; the NRC remains in contact with these facilities.

Prema Chandrathil
Public Affairs Officer
U.S. Nuclear Regulatory Commission
Region III
Lisle, IL
(630) 829-9663
prema.chandrathil@nrc.gov

Satorius, Mark

From: Satorius, Mark
Sent: Tuesday, March 15, 2011 3:56 PM
To: Collins, Elmo; McCree, Victor; Dean, Bill
Cc: Howell, Art; Lew, David; Pederson, Cynthia; Wert, Leonard
Subject: RE: Proposed Outreach activities

We are a lot like RII - no big requests for info from either our states or agreement states. RSLO's intend to stay tied into the latest info and respond to ??'s when they are presented. I've asked DRP and the RSLOs to consider inviting our FEMA V POC and give me a recommendation.

-----Original Message-----
From: Collins, Elmo
Sent: Tuesday, March 15, 2011 2:04 PM
To: McCree, Victor; Dean, Bill; Satorius, Mark
Cc: Howell, Art; Lew, David; Pederson, Cynthia; Wert, Leonard; Trojanowski, Robert; Woodruff, Gena; Maier, Bill
Subject: RE: Proposed Outreach activities

Thanks Bill and Victor -

Region IV looks a lot like Region II on these fronts. While we are getting a large number of inquiries, press and public, there is not a ground swell from the states.

That said, it is apparent that States are looking to be treated as a governmental partner, not as press or members of the public and thus, expect more information from NRC than they are getting about the status of the reactors in Japan.

Elmo

-----Original Message-----
From: McCree, Victor
Sent: Tuesday, March 15, 2011 1:52 PM
To: Dean, Bill; Collins, Elmo; Satorius, Mark
Cc: Howell, Art; Lew, David; Pederson, Cynthia; Wert, Leonard; Trojanowski, Robert; Woodruff, Gena
Subject: RE: Proposed Outreach activities

Bill,

I apologize for not responding to your email sooner.... Although our SLOs have received a couple of inquiries from state points-of-contact, we have not received the groundswell of inquiries that you have experienced. As a result, our SLO's will stay current on the events in Japan through the regular email updates and respond to any questions from their counterparts.

Also, although we routinely inform FEMA Region IV of our EOC meeting schedule and invite them to participate, they rarely do so. Based on the small number of inquiries we've received from states, EMDs, etc., thus far regarding the Japan event, I do not plan to extend them an additional invitation.

Vic
-----Original Message-----
From: Dean, Bill
Sent: Monday, March 14, 2011 6:00 PM
To: Collins, Elmo; Satorius, Mark; McCree, Victor

W/85

Cc: Howell, Art; Lew, David; Pederson, Cynthia; Wert, Leonard
Subject: Proposed Outreach activities

I am not sure what you have experienced thus far relative to the events unfolding in Japan, but I have had dialog today with State Liaison officers and emergency management directors, congressional staffers, and FEMA administrators all looking for the same thing: information they can use to address the groundswell of inquiries they are receiving. What do you think about:

1. Periodic calls with SLOs (maybe even daily right now) to update them on current information and receive, and where possible, answer questions; and

2. Inviting FEMA to EOC meetings to discuss emergency preparedness questions emanating from the Japanese situation?

Bill Dean
Regional Administrator
Region I, USNRC
Sent from NRC BlackBerry

Satorius, Mark

From: Dean, Bill
Sent: Tuesday, March 15, 2011 9:16 PM
To: Collins, Elmo; Satorius, Mark; McCree, Victor
Subject: Re: Response to Japan Earthquake/Tsunami

Great minds think alike. I have called an all hands meeting to do the same thing tomorrow.
Bill Dean
Regional Administrator
Region I, USNRC
Sent from NRC BlackBerry

From: Collins, Elmo
To: Satorius, Mark; McCree, Victor; Dean, Bill
Sent: Tue Mar 15 11:30:21 2011
Subject: Re: Response to Japan Earthquake/Tsunami

Mark
I think your plans are good as long as it is kept internal - I did it yesterday
Elmo

From: Satorius, Mark
To: McCree, Victor; Collins, Elmo; Dean, Bill
Sent: Tue Mar 15 11:00:00 2011
Subject: RE: Response to Japan Earthquake/Tsunami

I'm headed into a 'routine' all-staff meeting in 5 minutes and have decided to hijack the agenda and pretty much turn the meeting into an a informational update by myself and going into taking all questions from the staff (knowing that I will probably not be able to answer all comers). In addition, I decided this morning to send out the attached email w/ the OUO status as of 730. Not sure the last was kosher, but decided to move forward and beg for forgiveness later rather than ask permission...

From: McCree, Victor
Sent: Tuesday, March 15, 2011 9:11 AM
To: Collins, Elmo; Satorius, Mark; Dean, Bill
Subject: FW: Response to Japan Earthquake/Tsunami

FYI

From: McCree, Victor
Sent: Tuesday, March 15, 2011 10:08 AM
To: R2MAIL; R2RESIDENTS; R2_RESIDENT SITES
Subject: Response to Japan Earthquake/Tsunami

Good Morning.

I'm sure that all of you are aware of the ongoing events in Japan following last Friday's massive earthquake and tsunami. The loss of life and property due to these catastrophic events is truly devastating, and the U.S., along with a host of other countries are extending support to the Japanese government.

Shortly after the event, the NRC entered the Monitoring Mode and staffed the Headquarters Operations (Ops) Center. Our colleagues in the Ops Center have continued to gather information from media sources and the International Atomic Energy Agency which indicate that the condition of the Unit 1, 2 and 3 reactors at the Fukishima Daiichi nuclear station remains dynamic and represents a continuing safety concern. The Japanese government has implemented protective measures for persons within the emergency planning zone of the Fukishima station, including evacuation, sheltering, and issuance of potassium iodide. The NRC does not expect the U.S. to experience any harmful levels of radioactivity.

On yesterday, the NRC dispatched additional experts to Japan to better understand the status of efforts to safely shut down the damaged reactors at the Fukishima Daiichi site. They will provide technical advice to the U.S. Ambassador in Japan and contribute to the communications among stakeholders (see http://www.nrc.gov/reading-rm/doc-collections/news/2011/11-048.pdf). Chuck Casto has been designated to lead the NRC team and will serve as the single point of contact for the U.S. Ambassador on nuclear reactor issues. We wish Chuck and his team the best as they take on this challenging and important assignment. Please note that others in Region II also volunteered to support the response to the events in Japan and they may be asked in the coming weeks and months to supplement and/or replace the current U.S. team members.

The extraordinary events in Japan and their impact on that nation's nuclear infrastructure highlight some of the known risks involved in the technology we regulate. The events have also prompted widespread media and public interest in the safe use of nuclear power in this country. In addition, media commentary on the NRC's role in assuring safety of U.S., plants underscores the vital role that we play in ensuring that nuclear facilities are constructed, maintained, and operated in accordance with the requirements of their design and license. Despite these potential distractions, I echo the Chairman's message today in encouraging you to remain focused on carrying out the NRC mission, as well as Region II's vision.

Once again, I truly appreciate your professional, safety-focused, and high quality work.

Thank you, Vic

Satorius, Mark

From: Mitlyng, Viktoria
Sent: Tuesday, March 15, 2011 4:45 PM
To: All R3 Users
Subject: Japan earth quake talking points
Attachments: japan earth quake talking points.docx

Attached are the agency's latest talking points related to the situation in Japan. You can use them when talking to people outside of the agency. Please DO NOT PRINT THEM OUT AND DISTRIBUTE EXTERNALLY IN WRITTEN FORM.

Vika

Viktoria Mitlyng
Office of Public Affairs
US Nuclear Regulatory Commission
Region III
Lisle, IL 60532
Tel 630/829-9662
Fax 630/515-1026
e-mail: viktoria.mitlyng@nrc.gov

W/87

Quake_TP_3_15.docx

OPA

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.

- 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.

From: Grobe, Jack NRR
To: Rodriguez, Veronica
Subject: Re: Prep. for 3/17 & 3/30 CNS Meeting w/Chairman
Date: Tuesday, March 15, 2011 12:08:24 PM

I will be in the Ops Center 3 to 11
Jack Grobe, Deputy Director, NRR

release

From: Rodriguez, Veronica
To: Skeen, David; Grobe, Jack; Jones, Andrea; Quinones, Lauren; Regan, Christopher
Cc: Schwartzman, Jennifer
Sent: Tue Mar 15 11:31:47 2011
Subject: RE: Prep. for 3/17 & 3/30 CNS Meeting w/Chairman

All,

For info … Bill has been called to do a briefing on the Hill (last minute request). We are not sure he'll be able to make it back on time for our meeting at 4pm. Bill won't be able to support a meeting tomorrow; therefore, our plan is to keep the meeting as scheduled. Hopefully he'll make it. If he doesn't I'll exchange emails with him tomorrow to obtain guidance for our meeting with the Chairman on Thurs.

More to come,

release

Veronica

-----Original Appointment-----
From: Borchardt, Bill EDO
Sent: Thursday, March 10, 2011 8:30 AM
To: Borchardt, Bill; Rodriguez, Veronica; Skeen, David; Grobe, Jack; Schwartzman, Jennifer; Doane, Margaret; Jones, Andrea; Quinones, Lauren; Regan, Christopher
Subject: Prep. for 3/17 & 3/30 CNS Meeting w/Chairman
When: Tuesday, March 15, 2011 4:00 PM-4:30 PM (GMT-05:00) Eastern Time (US & Canada).
Where: O-17H1

When: Tuesday, March 15, 2011 4:00 PM-4:30 PM (GMT-05:00) Eastern Time (US & Canada).

Where: O-17H1

Note: The GMT offset above does not reflect daylight saving time adjustments.

~~*~*~*~*~*~*~*~*~*

POC Veronica Rodriquez

Rct 3/10

W/88

From: Grobe, Jack NRR
To: Tracy, Glenn
Cc: Ruland, William; Hilton, Nick; Giitter, Joseph; Cheok, Michael; Lubinski, John; McGinty, Tim; Givvines, Mary; Holian, Brian; Brown, Frederick; Boger, Bruce; Leeds, Eric; "slinnerooth@vantagehrs.com"
Subject: Re: Psychological Support
Date: Wednesday, March 16, 2011 7:11:47 PM

Thanks Glenn. I am providing this information to my Division Directors for their awareness and encorage them to make their staff aware of this availability doring their interactions with their staff.

Are there any preventive strategies that the EAP recommends that might be employeed, e.g., best practices to minimize problems?

Jack
Jack Grobe, Deputy Director, NRR

From: Tracy, Glenn NRO
To: Grobe, Jack; Leeds, Eric
Cc: Linnerooth, Sarah; Dosch, William; Buchholz, Jeri; Powell, Dawn; Cohen, Miriam; Evans, Michele; Wiggins, Jim; Cadoux, Claude
Sent: Wed Mar 16 14:21:48 2011
Subject: Psychological Support

Jack:
Thanks so much for your e-mail. I wanted to share with you that Sarah Linnerooth and Bill Dosch of HR are proactive in their preparedness and readiness to support you and those overseas (as you can see below your note to me). We thank you for your e-mail. Bill will be enhancing awareness of such access/support and I request you and the other managers ensure that you emphasize during your interactions with the staff.
Thank so much, Glenn

Glenn,

I spoke with Claude about processes for psychological support for our staff in this time of stress. I don't know what procedures we have for these types of situations but was hoping you guys are already ahead of me on this. Claude has experience in this area. I have become aware of challenging feelings that several staff are experiencing. Please keep us informed of what we can do to help in this area. Thanks for all you do.
Jack Grobe, Deputy Director, NRR

From: Linnerooth, Sarah — NRR
Sent: Tuesday, March 15, 2011 12:39 PM
To: Cohen, Miriam; Tracy, Glenn; Buchholz, Jeri; Powell, Dawn
Cc: Dosch, William; Lobe, Jon
Subject: FW: NRC Team to Japan

Hi Miriam,

Please let Jon and I know how we (EAP) can support the employees being deployed to Japan. I was able to connect with some of the employees being deployed yesterday and ensured they had our

EAP contact information and knew that it is available 24/7 to both them and their family members. I contacted our EAP contractor (EAP Consultants Inc.) and confirmed that employees will still have access to services and our 800 number from Japan. Dawn and I also spoke yesterday and believe she too reached out to the employees being deployed to provide them and their family members with our EAP information.

I have also connected with NSIR management and visited the Ops Center yesterday. I left our EAP pocket cards with the Ops Center management to distribute as needed to the many employees staffing the around the clock response at the Ops center. Please let us know if you feel we should reach out to any other offices or employees.

Another concern would be to ensure we provide the needed support to the deployed employees upon their return from Japan. One service that may be appropriate for us to arrange is a Critical Incident Stress Debriefing (CISD). Our EAP team has a lot of expertise in facilitating and/or supporting CISDs. We are here to support in any way we are needed.

Thanks,
Sarah

Sarah Linnerooth
EAP and Fitness Program Manager
Office of Human Resources - Work Life & Benefits Branch
U.S. Nuclear Regulatory Commission
Mailstop: T3 C4
Phone - (301) 415-7113
Sarah.Linnerooth@nrc.gov

From: Hudson, Jody — HR
Sent: Tuesday, March 15, 2011 11:38 AM
To: HR_EMPLOYEES_distribution
Subject: NRC Team to Japan

As an FYI, the following email from Eric Leeds identifies the NRC employees comprising the assistance team going to Japan. HRTD/TTC's Richard Devercelly is among them. We wish them all well on this important mission.

Jody Hudson
Chief Learning Officer
Human Resources Training & Development

U.S. Nuclear Regulatory Commission
Mailstop: GW-4A01
301-492-2215

From: Leeds, Eric
Sent: Monday, March 14, 2011 1:11 PM
To: Collins, Elmo; Satorius, Mark; McCree, Victor; Dean, Bill; Sheron, Brian; Tracy, Glenn; Hudson, Jody; Johnson, Michael; Miller, Charles; Haney, Catherine; Zimmerman, Roy; Stewart, Sharon; Virgilio, Martin; Weber, Michael; Borchardt, Bill; Mamish, Nader; Doane, Margaret; Muessle, Mary
Cc: Boger, Bruce; Grobe, Jack; Ruland, William; Meighan, Sean
Subject: Confirmation of names for Japan

Folks –

Thanks so much for your help – we have a strong database of names/expertise to support the Japanese. For this first wave, we are sending Chuck Casto, John Monninger, Tony Nakanishi, Tim Kolb, Jack Foster and Richard Devercelly. I believe that Bruce Boger has contacted all those going to join Tony Ulsis and Jim Trapp in Japan.

I imagine that at some point we may need to send a second wave of responders to relieve our first wave. We will let you know as soon as we know if this needs to be done. We are also sensitive not to over-burden any one office.

Thanks again for your support!

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

From: Givvines, Mary – NRR
To: Leeds, Eric; Grobe, Jack; Boger, Bruce
Subject: Fw: Scheduling Call Summary - March 14, 2011
Date: Tuesday, March 15, 2011 4:30:35 PM
Attachments: Scheduling Call Summary for 3-14-11.docx

Fyi

From: Taylor, Renee – OEDO
To: Abraham, Susan; Akstulewicz, Brenda; Andersen, James; Ash, Darren; Baker, Pamela; Belmore, Nancy; Bettis, Ashley; Boger, Bruce; Borchardt, Bill; Boyce, Thomas (OIS); Boyd, Lena; Brenner, Eliot; Brown, Milton; Buckley, Patricia; Campbell, Andy; Casby, Marcia; Casto, Chuck; Cianci, Sandra; Cohen, Miriam; Collins, Elmo; Crawford, Carrie; Crouch, Nicole; Cullison, David; Dambly, Jan; Dapas, Marc; Darby, Krystal; Deegan, George; Delligatti, Mark; Dembek, Stephen; Doolittle, Elizabeth; Dorman, Dan; Dubose, Sheila; EDO Distribution; Ficks, Ben; Flory, Shirley; Garland, Stephanie; Givvines, Mary; Golder, Jennifer; Grobe, Jack; Gusack, Barbara; Harris, Natasha; Hasan, Nasreen; Hayden, Elizabeth; Higginbotham, Tina; Holahan, Gary; Holahan, Patricia; Hopkins, Rhonda; Howard, Patrick; Howell, Art; Jaegers, Cathy; Kaplan, Michele; Kelley, Corenthis; Krupnick, David; Landau, Mindy; Lee, Pamela; Lew, David; Mamish, Nader; Matakas, Gina; McCrary, Cheryl; Miles, Patricia; Mitchell, Reggie; Moore, Scott; Muessle, Mary; ODaniell, Cynthia; Owen, Lucy; Pederson, Cynthia; Poland, Catherine; Powell, Amy; Pulliam, Timothy; Quesenberry, Jeannette; Raynor, Kathleen; Reynolds, Steven; Rheaume, Cynthia; Riddick, Nicole; Ronewicz, Lynn; Ross, Brenda; Ross, Robin; Salus, Amy; Santiago, Patricia; Satorius, Mark; Schaeffer, James; Schmidt, Rebecca; Schum, Constance; Schumann, Stacy; Schwarz, Sherry; Shah, Maria; Shay, Jason; Smith, Beverly; Somerville, Glenda; Sprogeris, Patricia; Stewart, Sharon; Tannenbaum, Anita; Taylor, Renee; Tomczak, Tammy; Tracy, Glenn; Uhle, Jennifer; Veltri, Debra; Virgilio, Martin; Walker, Dwight; Weber, Michael; Wert, Leonard; West, Steven; Williams, Barbara; Wyatt, Melissa; Zimmerman, Roy; Seltzer, Rickie; Arildsen, Jesse
Sent: Tue Mar 15 16:20:36 2011
Subject: Scheduling Call Summary - March 14, 2011

Please find attached the notes from the March 14th scheduling call with the AO.

Thank you,

Renee Taylor

Administrative Assistant to the Executive Director for Operations
U.S. Nuclear Regulatory Commission
(301) 415-1701

W/89

Scheduling Call Summary for March 14, 2011

Agenda/Action Items:

1) OEDO discussed issues associated with NRC's support of recovery efforts in Japan. It was noted that all requests for support from the NRC Operations Center have first priority. Two NRC personnel were deployed to the American Embassy in Tokyo and nine additional (six program office and three OIP) personnel are being deployed to help support the Japanese regulators. Staff not directly supporting the response efforts should continue to focus on work in progress. It was also noted that the upcoming Congressional briefings will shift focus from budget issues to issues associated with the Japanese nuclear incidents.

2) NSIR stated that the Headquarters Operations Center staffing is expected to continue at current levels through Friday, and at possible reduced levels through the weekend.

3) OEDO discussed the Strategic Acquisition Transformation Plan. The SRM was issued on February 28th, and both major recommendations were accepted by the Commission. It was noted that contractual authority will reside with the EDO, to be further delegated, and that the process for generating Chairman papers has been terminated. It was also noted that new procurement templates will be promulgated in the near future.

4) OEDO discussed profiling of OIG reports and emphasized that, after a final report is published it will be made public and posted in ADAMS. Following this, all subsequent correspondence should be made public (with the exception of items that are classified, OUO, etc).

5) OEDO discussed feedback from the recent Commission Agenda Planning Meeting. It was noted that the Commissioners were very pleased with recent meetings. Notable points included good eye contact from speakers (i.e., not reading from a script), good presentation of technical detail, and use of pictures to illustrate salient points. The need for revisions to guidance for Commission meeting preparation is being evaluated.

6) CFO requested survey feedback concerning implementation of FAIMIS by March 25.

From: Grobe, Jack
To: Hilton, Nick; Nguyen, Quynh; Cheok, Michael; Klein, Alex; Leeds, Eric
Subject: Re: NEI Meetings with Eric Leeds and Jack Grobe
Date: Tuesday, March 15, 2011 12:19:05 PM

Mid next week is great
Jack Grobe, Deputy Director, NRR

From: Hilton, Nick
To: Grobe, Jack; Nguyen, Quynh; Cheok, Michael; Klein, Alex; Leeds, Eric
Sent: Mon Mar 14 14:22:25 2011
Subject: RE: NEI Meetings with Eric Leeds and Jack Grobe

Jack,

We can probably provide a reasonable draft paper mid next week, if that works OK for you. If you think we need something much sooner, we can probably put something out sooner, but obviously the quality will be a little better if we work it a little more before putting out for comments.

Nick

From: Grobe, Jack
Sent: Monday, March 14, 2011 1:28 PM
To: Nguyen, Quynh; Cheok, Michael; Klein, Alex; Leeds, Eric; Hilton, Nick
Subject: Re: NEI Meetings with Eric Leeds and Jack Grobe

Q,

Please get with Jim Anderson/Brian Wittick and see what you can do to move this along. While nothing is firm until the Five Great Americans speak on the issue, if the industry can get the paper they can begin thinking about which licensees would come when and then adjust if the Commission addresses the question of staggering with a different twist.

Mike/Alex,

We need to start planning for a meeting with the industry to discuss staggering approach. Possibly after the paper is released we can start with a phone call to help industry understand our needs and then a public meeting to finalize the information that we need for the new draft discretion policy - probably a complete list of plants and submission dates.

We cannot do all these things in series or we will not get done in time.

Nick,

When will I see a draft of the Commission Paper with the draft discretion proposal. We can get close to final and fill oin the blanks later. I sense that there will be a lot of noodling on the draft by the various internal stakeholders.

Thanks to all. We should probably set a target of April 15 for the final discretion paper to get to 17/18 so the Commission has enough time to act and still give the staff/industry time to implement.
Jack Grobe, Deputy Director, NRR

WPO

From: Nguyen, Quynh
To: MARION, Alex <axm@nei.org>
Cc: Grobe, Jack
Sent: Mon Mar 14 13:11:10 2011
Subject: RE: NEI Meetings with Eric Leeds and Jack Grobe

Alex,

I checked upstairs and it has not been released publicly yet – when I get word, I will send to you.

Also, Jack will be covering the Ops Center from 1500-2300 all week so I'll do my best to cover regarding NEI activities!

Quynh

From: MARION, Alex [mailto:axm@nei.org]
Sent: Monday, March 14, 2011 11:09 AM
To: Nguyen, Quynh
Cc: Grobe, Jack
Subject: RE: NEI Meetings with Eric Leeds and Jack Grobe

Can someone please send me the SECY paper proposing a staggered review schedule. I understand it has been released but we can seem to obtain it from your website. Thank you in advance.

From: Nguyen, Quynh [mailto:Quynh.Nguyen@nrc.gov]
Sent: Monday, March 14, 2011 10:53 AM
To: MARION, Alex
Cc: Schwarz, Sherry; Cohen, Shari; Grobe, Jack; Leeds, Eric
Subject: NEI Meetings with Eric Leeds and Jack Grobe

Alex,

I just called and left you a message. Given the recent events in Japan, I recommend that we postpone your status periodic with Eric Leeds and Jack Grobe (both occurring on March 16).

I believe you are scheduled to meet with Jack on March 30th.

Can you confirm receipt of cancellations? Meeting on 30th?

Thanks,
Quynh

FOLLOW US ON

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From: Leeds, Eric — NRR
To: Grobe, Jack; Ruland, William
Cc: Boger, Bruce
Subject: RE: Action Request - Potential Temporary Assignees to OIP
Date: Tuesday, March 15, 2011 12:31:17 PM

We need to be sensitive to staffing the Ops Center, which I just heard will go for another month, potentially. It would be helpful to get more info from OIP on the type of expertise they are looking for, besides international experience.

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

-----Original Message-----
From: Grobe, Jack — NRR
Sent: Tuesday, March 15, 2011 12:11 PM
To: Ruland, William
Cc: Leeds, Eric; Boger, Bruce
Subject: Fw: Action Request - Potential Temporary Assignees to OIP
Importance: High

Bill could you respond for NRR from the LT
Jack Grobe, Deputy Director, NRR

----- Original Message -----
From: Ramsey, Jack — OEP
To: Holahan, Gary; Evans, Michele; Boger, Bruce; Grobe, Jack; Uhle, Jennifer; Dorman, Dan; Moore, Scott
Cc: Johnson, Michael; Rosales-Cooper, Cindy; Wiggins, Jim; Diec, David; Leeds, Eric; Cullingford, Michael; Astwood, Heather; Sheron, Brian; Sangimino, Donna-Marie; Dehn, Jeff; Haney, Catherine; Smith, Shawn; Miller, Charles; Cool, Donald; Tracy, Glenn; Doane, Margaret; Mamish, Nader; Dembek, Stephen; Abrams, Charlotte; Owens, Janice; McDevitt, Joan; Virgilio, Martin; Williams, Shawn; Weber, Michael
Sent: Tue Mar 15 11:25:49 2011
Subject: Action Request - Potential Temporary Assignees to OIP

All,

Activities involving the evolving situation in Japan are having, and are projected to continue to have, a significant impact upon OIP resources. With this, OIP would like to ask if each of the program offices could identify whether they have staff (preferably staff with international experience) that could be detailed to OIP for a period of, at least initially, 3 to 6 months. Any staff considered for possible rotation to OIP should be aware that they could potentially travel to Japan and be exposed to ionizing radiation. Please note that such identified staff may, or may not, actually be needed. Instead, OIP is hoping to have a list of individuals, with program office blessing, that could be utilized (including with very little or no notice).

If possible, feedback by late this week (Friday morning) would be extremely helpful. Within OIP, Joan McDevitt will be the principal point of contact for this.

Thanks in advance to everyone for their understanding during this challenging time.

Jack

3/91

From: Grobe, Jack NRR
To: Grobe, Jack
Subject: Fw: NEXT STEP? SRM - COMGEA-11-0001 - Utilization of Expert Judgment in Regulatory Decision Making
Date: Tuesday, March 15, 2011 7:07:48 PM

Jack Grobe, Deputy Director, NRR

From: Grobe, Jack
To: Leeds, Eric; Nguyen, Quynh; Boger, Bruce
Cc: Ruland, William; Meighan, Sean
Sent: Tue Mar 15 19:06:37 2011
Subject: Re: NEXT STEP? SRM - COMGEA-11-0001 - Utilization of Expert Judgment in Regulatory Decision Making

Got it
Jack Grobe, Deputy Director, NRR

From: Leeds, Eric NRR
To: Nguyen, Quynh; Boger, Bruce; Grobe, Jack
Cc: Ruland, William; Meighan, Sean
Sent: Tue Mar 15 17:30:20 2011
Subject: RE: NEXT STEP? SRM - COMGEA-11-0001 - Utilization of Expert Judgment in Regulatory Decision Making

Jack – Please take the lead on this one.

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

From: Nguyen, Quynh NRR
Sent: Tuesday, March 15, 2011 3:33 PM
To: Leeds, Eric; Boger, Bruce; Grobe, Jack
Cc: Ruland, William; Meighan, Sean
Subject: NEXT STEP? SRM - COMGEA-11-0001 - Utilization of Expert Judgment in Regulatory Decision Making

How should we proceed with this? I know we had guys comment on it...

The staff should provide to the Commission, within 6 months, a plan for the development of guidance that will ensure that the formal utilization of expert judgment is applied consistently in regulatory decision making throughout the Agency. This plan should describe the staff's approach, schedule, and estimated resources. This plan should recognize that the development of the guidance should include the following:

i. a summary of past and ongoing significant NRC activities that utilized expert judgment to identify the lessons-learned, document the approaches[1], and identify

3/92

significant differences among the approaches,

ii. a survey of recent research to identify promising new approaches (or techniques that can be applied within the broader approach) to expert judgment that may be appropriate for use in nuclear applications,

iii. an evaluation of recent activities within other agencies that relied on expert judgment to identify the lessons-learned, document the approaches, and identify differences among the approaches and those used in NRC activities,

iv. options that match the approach with the nature and significance of the issue and the extent to which expert judgment is relied upon in regulatory decision making,

v. estimates of resources associated with each option for planning purposes,

vi. guidance that is prescriptive enough to ensure consistent application of expert judgment within the Agency, yet is sufficiently flexible to account for the wide diversity of issues that the Agency faces. The user should be able to tailor the approach to be applicable to the unique issue of concern, and

vii. guidance must allow flexibility in application and the use of highly stylized approaches by individual researchers, as long as scrutability is maintained.

From: RidsNrrOd Resource
Sent: Tuesday, March 15, 2011 3:04 PM
To: Meighan, Sean
Cc: Nguyen, Quynh
Subject: FW: SRM - COMGEA-11-0001 - Utilization of Expert Judgment in Regulatory Decision Making

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From: RidsEdoDraftSrmVote Resource
Sent: Tuesday, March 15, 2011 12:52 PM
To: Ash, Darren; Borchardt, Bill; Boyd, Lena; Buckley, Patricia; Clarke, Deanna; Cohen, Miriam; EDO_Staff_Assistants; Flory, Shirley; Fry, Jeannie; Garland, Stephanie; Johnson, Michael; Mamish, Nader; Matakas, Gina; Miles, Patricia; Miller, Charles; Owen, Lucy; Riddick, Nicole; RidsAdmMailCenter Resource; RidsCsoMailCenter Resource; RidsFsmeOd Resource; RidsHrMailCenter Resource; RidsNmssOd Resource; RidsNroMailCenter Resource; RidsNrrOd Resource; RidsNsirMailCenter Resource; RidsOeMailCenter Resource; RidsOiMailCenter Resource; RidsOIS Resource; RidsResOd Resource; RidsRgn1MailCenter Resource; RidsRgn2MailCenter Resource; RidsRgn3MailCenter Resource; RidsRgn4MailCenter Resource; RidsSbcrMailCenter Resource; Thomas, Loretta; Virgilio, Martin; Walker, Dwight; Weber, Michael
Subject: FW: SRM - COMGEA-11-0001 - Utilization of Expert Judgment in Regulatory Decision Making

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From: Lewis, Antoinette
Sent: Tuesday, March 15, 2011 11:11 AM
To: Vietti-Cook, Annette; Baggett, Steven; Bates, Andrew; Batkin, Joshua; Blake, Kathleen; Bollwerk, Paul; Bozin, Sunny; Bradford, Anna; Brown, Theron; Bubar, Patrice; Bupp, Margaret; Burns, Stephen; Chairman Temp; Clark, Lisa; Coggins, Angela; Cordes, John; Crawford, Carrie; Cutchin, James; Davis, Roger; Fopma, Melody; Franovich, Mike; Gibbs, Catina; Hackett, Edwin; Hart, Ken; Harves, Carolyn; Hawkens, Roy; Hayden, Elizabeth; Henderson, Karen; Herr, Linda; Hipschman, Thomas; Hudson, Sharon; KLS Temp; Kock, Andrea; Lepre, Janet; Loyd, Susan; Mamish, Nader; Marshall, Michael; Mitchell, Reggie; Monninger, John; Moore, Scott; OCA Distribution; OPA Resource; Orders, William; Pace, Patti; Poole, Brooke; Rabideau, Peter; Reddick, Darani; Laufer, Richard; RidsEdoDraftSrmVote Resource; RidsOcaaMailCenter Resource; RidsOcfoMailCenter Resource; RidsOgcMailCenter Resource; RidsOigMailCenter Resource; RidsOipMailCenter Resource; Bavol, Rochelle; Rothschild, Trip; Joosten,

Sandy; Savoy, Carmel; Sharkey, Jeffry; Shea, Pamela; Snodderly, Michael; Sosa, Belkys; Speiser, Herald; Svinicki, Kristine; Temp, WCO; Temp, WDM; Thoma, John; Warren, Roberta; Zorn, Jason; Temp, GEA; Apostolakis, George; Tadesse, Rebecca; Butler, Gail; Perry, Jamila; Doane, Margaret; Castleman, Patrick; Montes, David; Dhir, Neha; Adler, James; Jimenez, Patricia; Muessle, Mary; Nieh, Ho; Ostendorff, William; Warnick, Greg; Pearson, Laura; Lui, Christiana
Cc: Wright, Darlene; Lewis, Antoinette
Subject: SRM - COMGEA-11-0001 - Utilization of Expert Judgment in Regulatory Decision Making

(ML110740304) Public

In an effort to keep the NRC staff informed of Commission decisions in a timely manner, attached for your information are the Staff Requirements Memoranda (SRMs) signed by the Secretary on March 15, 2011. Please make additional distribution to interested staff members in your office.

If you have any questions, please give me a call on 415-1969.

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[1] The expert judgment approach refers to the process used to elicit information from experts, analyze this information to develop results, and determine the implications of the results to support regulatory decision making.

EDO

From: Virgilio, Martin
To: Borchardt, Bill; Weber, Michael; Leeds, Eric; Grobe, Jack; Casto, Chuck; Dorman, Dan
Subject: WANO
Date: Tuesday, March 15, 2011 10:21:05 PM

Bill

I spoke with Jim Ellis this evening. I complimented him on the Event Report and the specific actions it requires.

The purpose of the call was to request his support in providing access for our site team members to periodic TEPCO/WANO meetings that where facility status is discussed.

It turns out that the president of WANO international is in town (Atlanta) and Jim will discuss our interest with him. Jim stated that he would call WANO Tokyo if his discussions with the President were not successful.

In closing he noted that INPO should be viewed as the POC for industry. He suggested that having an INPO staff member on our team could both help us and help them stay connected. I told him that we would consider his offer.

I suggested that he call either you or me with the results of his interaction with WANO.

Marty

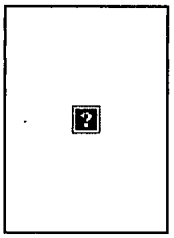
3/93

From: EDO Update
To: Taylor, Renee
Subject: EDO Update
Date: Tuesday, March 15, 2011 10:15:51 AM

EDO Banner EDO Banner

EDO Update

Tuesday, March 15, 2011



We are all saddened about the tragic events in Japan. Our thoughts and prayers go out to all of those affected by the earthquake and tsunami. The serious nuclear power plant issues have obviously been a special focus of the NRC. Rest assured, we are closely monitoring the situation and providing requested assistance. Senior managers and staff have been manning the Operations Center in rotations 24 hours a day since the earthquake. Over the weekend, we sent two staff members to Japan who are boiling-water reactor experts (the technology used at the Fukushima site). At the Japanese government's request, we have also sent nine additional NRC staff to help the American embassy in Tokyo and to support the Japanese regulators. Not surprisingly, the Congressional hearing scheduled for this Wednesday, which was originally to focus on our Fiscal Year 2012 budget, will now be primarily focused on the events in Japan.

It is not for the NRC to speak for the Japanese or United States governments, so I won't comment on the situation in any greater detail. Additional information can be obtained from the International Atomic Energy Agency and the U.S. Agency for International Development, a part of the State Department that is coordinating the U.S. response and assistance efforts.

It is possible that some of you will be requested by colleagues in another country to provide technical advice and assistance during this emergency. It is essential that all such communications be handled through the NRC Operations Center. If you receive such a request, contact the NRC Operations Officer (301-816-5100 or via the NRC Operator) immediately. All media calls should be forwarded to the Office of Public Affairs (301-415-8200).
If you receive information regarding this or any emergency (foreign or domestic) and you are not certain that the NRC's Incident Response Operations Officer is already aware of that information, you should contact the NRC Operations Officer (301-816-5100 or via the NRC Operator) and provide that information.

Notwithstanding the significance of what is occurring in Japan, we still have our domestic mission to carry out, and with the exception of the small number of people who have been directly called upon to respond to this situation we should all proceed with previously planned activities. We will continue to process licensing actions, conduct inspections, and fulfill our regulatory responsibilities.

In accordance with NRC regulations, every American nuclear power plant is designed with multiple, redundant safety systems to be robust enough to withstand the seismic and natural event risks associated with its specific location. In other words, the NRC analyzes every reactor site for own specific features and potential hazards, and requires the plant to be designed and operated accordingly. But in calculating risks, a certain level of uncertainty is always present. To compensate for these uncertainties, the NRC utilizes the concept of "defense in depth"—an approach to safety where multiple, diverse, and redundant layers of protection are used to prevent accidents and mitigate consequences. While it is inappropriate to speculate on what would happen to an American nuclear power plant under similar circumstances to the Japan event, we do know that U.S. nuclear facilities are among the most robust and well-protected civilian structures in the country.

Let me express my thanks to the NRC staff that have served in or supported the Operations Center since the earthquake hit. I'd also like to thank those who have had to compensate for their colleagues who have been called away from their regular duties.

I will keep you informed of ongoing developments.

Bill Borchardt, EDO

From: Virgilio, Martin -0830
To: Weber, Michael; ET01 Hoc
Cc: LIA05 Hoc; Dorman, Dan; Grobe, Jack
Subject: Re: FYI - Assistant Secretary Level SVTC on Japan Earthquake - March 16, 2011 - 8:00-9:00am
Date: Tuesday, March 15, 2011 9:23:05 PM

Mike

How can we help/support you beyond the paper we are already grinding out

Marty

From: Weber, Michael -0830
To: ET01 Hoc
Cc: LIA05 Hoc; Virgilio, Martin; Dorman, Dan
Sent: Tue Mar 15 18:39:53 2011
Subject: FYI - Assistant Secretary Level SVTC on Japan Earthquake - March 16, 2011 - 8:00-9:00am

Here is the agenda for tomorrow morning's call at 0800, which I have been asked to attend.

w/95

From: Manoly, Kamal - NRR
To: Nguyen, Quynh - NRR
Cc: Martin, Robert; Thomas, Eric; Meighan, Sean; Boger, Bruce; Grobe, Jack
Subject: RE: Earthquake
Date: Tuesday, March 15, 2011 1:29:15 PM

Quynh,
I am not sure what you mean by "**How**" the plants are built? Are you referring to boilers vs. pressurized reactors in terms of structural configuration?
Kamal

release

From: Nguyen, Quynh - NRR
Sent: Tuesday, March 15, 2011 12:05 PM
To: Manoly, Kamal - RES
Cc: Martin, Robert; Thomas, Eric; Meighan, Sean; Boger, Bruce; Grobe, Jack
Subject: FW: Earthquake

release

Kamal,

We are working on earthquake question responses. Maybe you want to start thinking about responding with how the plants are built?

From: Kammerer, Annie - RES
Sent: Tuesday, March 15, 2011 11:04 AM
To: Ake, Jon; Munson, Clifford
Cc: Meighan, Sean; Nguyen, Quynh
Subject: RE: Earthquake

Jon/Cliff: another request, but something we can do later today. Quynh and Sean preparing a response to the questions, "what if an 8.9 happened at one of our plants." This is an obvious question from the public who doesn't understand tectonics and one that we are going to be asked over and over.

I'm suggesting the approach to developing the response:

1) Explain that an 8.9 can't happen at the plants
2) Explain that plants are designed to ground motions and not magnitudes
3) Figure out the distance from the plane to the plants in Japan. Try to determine rough estimates of the ground motions at the plants (note, we have some numbers on the shakemap, but they are too low based on the recording of 0.58g at onagawa) (Jon do you have a subduction model at your fingertips?)
4) use that estimate to compare to the ground motions and to say "this ground motion is only expected every XX years on average at this plant. However an 8.9 can't occur because it requires a subduction zone...."

This needs to be written up so that the public can understand.

Again, this is not the top of the list, but something to do today when we get a breather.

Sean/Quynh: we'll do our best.

3/96

Annie

From: Kammerer, Annie — RES
Sent: Tuesday, March 15, 2011 10:34 AM
To: Nguyen, Quynh — NRR
Cc: Meighan, Sean
Subject: RE: Earthquake

From: Nguyen, Quynh — NRR
Sent: Tuesday, March 15, 2011 10:33 AM
To: Kammerer, Annie — RES
Cc: Meighan, Sean
Subject: Earthquake

2-53

Satorius, Mark

From: OPA Resource
Sent: Tuesday, March 15, 2011 1:46 PM
To: Ash, Darren; Barkley, Richard; Batkin, Joshua; Bell, Hubert; Belmore, Nancy; Bergman, Thomas; Bollwerk, Paul; Bonaccorso, Amy; Borchardt, Bill; Bozin, Sunny; Brenner, Eliot; Brock, Terry; Brown, Boris; Bubar, Patrice; Burnell, Scott; Burns, Stephen; Carpenter, Cynthia; Chandrathil, Prema; Clark, Theresa; Collins, Elmo; Couret, Ivonne; Crawford, Carrie; Cutler, Iris; Dacus, Eugene; Dapas, Marc; Davis, Roger; Dean, Bill; Decker, David; Dricks, Victor; Droggitis, Spiros; Flory, Shirley; Franovich, Mike; Gibbs, Catina; Haney, Catherine; Hannah, Roger; Harbuck, Craig; Harrington, Holly; Hasan, Nasreen; Hayden, Elizabeth; Holahan, Gary; Holahan, Patricia; Holian, Brian; Jacobssen, Patricia; Jaczko, Gregory; Jasinski, Robert; Jenkins, Verlyn; Johnson, Michael; Jones, Andrea; Kock, Andrea; Kotzalas, Margie; Ledford, Joey; Lee, Samson; Leeds, Eric; Lepre, Janet; Lew, David; Lewis, Antoinette; Loyd, Susan; Magwood, William; McCrary, Cheryl; McGrady-Finneran, Patricia; McIntyre, David; Mensah, Tanya; Mitlyng, Viktoria; Monninger, John; Montes, David; Nieh, Ho; Ordaz, Vonna; Ostendorff, William; Owen, Lucy; Powell, Amy; Quesenberry, Jeannette; Reddick, Darani; Regan, Christopher; Reyes, Luis; Riddick, Nicole; RidsSecyMailCenter Resource; Riley (OCA), Timothy; Rohrer, Shirley; Samuel, Olive; Satorius, Mark; Schaaf, Robert; Schmidt, Rebecca; Scott, Catherine; Screnci, Diane; Shaffer, Vered; Shane, Raeann; Sharkey, Jeffry; Sheehan, Neil; Sheron, Brian; Siurano-Perez, Osiris; Steger (Tucci), Christine; Svinicki, Kristine; Tabatabai, Omid; Tannenbaum, Anita; Taylor, Renee; Temp, WDM; Thomas, Ann; Uhle, Jennifer; Uselding, Lara; Vietti-Cook, Annette; Virgilio, Martin; Virgilio, Rosetta; Walker-Smith, Antoinette; Weaver, Doug; Weber, Michael; Weil, Jenny; Werner, Greg; Wiggins, Jim; Williams, Evelyn; Zimmerman, Roy; Zorn, Jason
Subject: *RESEND*Press Release: NRC Analysis Continues to Support Japan's Protective Actions
Attachments: 11-049.docx

To be posted on the live web and public release in 10-15 minutes.

Office of Public Affairs
US Nuclear Regulatory Commission
301-415-8200
opa.resource@nrc.gov

W/97

NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

Office of Public Affairs Telephone: 301/415-8200
Washington, D.C. 20555-0001
E-mail: opa.resource@nrc.gov Site: www.nrc.gov
Blog: http://public-blog.nrc-gateway.gov

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 recommend 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.

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.

###

Satorius, Mark

From: OPA Resource
Sent: Tuesday, March 15, 2011 12:30 PM
To: Ash, Darren; Barkley, Richard; Batkin, Joshua; Bell, Hubert; Belmore, Nancy; Bergman, Thomas; Bollwerk, Paul; Bonaccorso, Amy; Borchardt, Bill; Bozin, Sunny; Brenner, Eliot; Brock, Terry; Brown, Boris; Bubar, Patrice; Burnell, Scott; Burns, Stephen; Carpenter, Cynthia; Chandrathil, Prema; Clark, Theresa; Collins, Elmo; Couret, Ivonne; Crawford, Carrie; Cutler, Iris; Dacus, Eugene; Dapas, Marc; Davis, Roger; Dean, Bill; Decker, David; Dricks, Victor; Droggitis, Spiros; Flory, Shirley; Franovich, Mike; Gibbs, Catina; Haney, Catherine; Hannah, Roger; Harbuck, Craig; Harrington, Holly; Hasan, Nasreen; Hayden, Elizabeth; Holahan, Gary; Holahan, Patricia; Holian, Brian; Jacobssen, Patricia; Jaczko, Gregory; Jasinski, Robert; Jenkins, Verlyn; Johnson, Michael; Jones, Andrea; Kock, Andrea; Kotzalas, Margie; Ledford, Joey; Lee, Samson; Leeds, Eric; Lepre, Janet; Lew, David; Lewis, Antoinette; Loyd, Susan; Magwood, William; McCrary, Cheryl; McGrady-Finneran, Patricia; McIntyre, David; Mensah, Tanya; Mitlyng, Viktoria; Monninger, John; Montes, David; Nieh, Ho; Ordaz, Vonna; Ostendorff, William; Owen, Lucy; Powell, Amy; Quesenberry, Jeannette; Reddick, Darani; Regan, Christopher; Reyes, Luis; Riddick, Nicole; RidsSecyMailCenter Resource; Riley (OCA), Timothy; Rohrer, Shirley; Samuel, Olive; Satorius, Mark; Schaaf, Robert; Schmidt, Rebecca; Scott, Catherine; Screnci, Diane; Shaffer, Vered; Shane, Raeann; Sharkey, Jeffry; Sheehan, Neil; Sheron, Brian; Siurano-Perez, Osiris; Steger (Tucci), Christine; Svinicki, Kristine; Tabatabai, Omid; Tannenbaum, Anita; Taylor, Renee; Temp, WDM; Thomas, Ann; Uhle, Jennifer; Uselding, Lara; Vietti-Cook, Annette; Virgilio, Martin; Virgilio, Rosetta; Walker-Smith, Antoinette; Weaver, Doug; Weber, Michael; Weil, Jenny; Werner, Greg; Wiggins, Jim; Williams, Evelyn; Zimmerman, Roy; Zorn, Jason
Subject: Press Release: NRC Analysis Continues to Support Japan's Protective Actions
Attachments: 11-049.docx

Attaching the press release would be helpful!

To be issued and posted to the live web in 15 minutes.

Office of Public Affairs
US Nuclear Regulatory Commission
301-415-8200
opa.resource@nrc.gov

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NRC NEWS

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 recommend 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.

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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Satorius, Mark

From: Satorius, Mark
Sent: Tuesday, March 15, 2011 12:35 PM
To: Anne Boland; Cynthia Pederson; Gary Shear; Holt, BJ; Louden, Patrick; OBrien, Kenneth; Sotiropoulos, Dina; Steven Reynolds; West, Steven
Subject: FW: Press Release: (Revised) NRC Sends Additional Experts to Assist Japan
Attachments: 11-048R.docx

From: OPA Resource
Sent: Tuesday, March 15, 2011 10:41 AM
To: Ash, Darren; Barkley, Richard; Batkin, Joshua; Bell, Hubert; Belmore, Nancy; Bergman, Thomas; Bollwerk, Paul; Bonaccorso, Amy; Borchardt, Bill; Bozin, Sunny; Brenner, Eliot; Brock, Terry; Brown, Boris; Bubar, Patrice; Burnell, Scott; Burns, Stephen; Carpenter, Cynthia; Chandrathil, Prema; Clark, Theresa; Collins, Elmo; Couret, Ivonne; Crawford, Carrie; Cutler, Iris; Dacus, Eugene; Dapas, Marc; Davis, Roger; Dean, Bill; Decker, David; Dricks, Victor; Droggitis, Spiros; Flory, Shirley; Franovich, Mike; Gibbs, Catina; Haney, Catherine; Hannah, Roger; Harbuck, Craig; Harrington, Holly; Hasan, Nasreen; Hayden, Elizabeth; Holahan, Gary; Holahan, Patricia; Holian, Brian; Jacobssen, Patricia; Jaczko, Gregory; Jasinski, Robert; Jenkins, Verlyn; Johnson, Michael; Jones, Andrea; Kock, Andrea; Kotzalas, Margie; Ledford, Joey; Lee, Samson; Leeds, Eric; Lepre, Janet; Lew, David; Lewis, Antoinette; Loyd, Susan; Magwood, William; McCrary, Cheryl; McGrady-Finneran, Patricia; McIntyre, David; Mensah, Tanya; Mitlyng, Viktoria; Monninger, John; Montes, David; Nieh, Ho; Ordaz, Vonna; Ostendorff, William; Owen, Lucy; Powell, Amy; Quesenberry, Jeannette; Reddick, Darani; Regan, Christopher; Reyes, Luis; Riddick, Nicole; RidsSecyMailCenter Resource; Riley (OCA), Timothy; Rohrer, Shirley; Samuel, Olive; Satorius, Mark; Schaaf, Robert; Schmidt, Rebecca; Scott, Catherine; Screnci, Diane; Shaffer, Vered; Shane, Raeann; Sharkey, Jeffry; Sheehan, Neil; Sheron, Brian; Siurano-Perez, Osiris; Steger (Tucci), Christine; Svinicki, Kristine; Tabatabai, Omid; Tannenbaum, Anita; Taylor, Renee; Temp, WDM; Thomas, Ann; Uhle, Jennifer; Uselding, Lara; Vietti-Cook, Annette; Virgilio, Martin; Virgilio, Rosetta; Walker-Smith, Antoinette; Weaver, Doug; Weber, Michael; Weil, Jenny; Werner, Greg; Wiggins, Jim; Williams, Evelyn; Zimmerman, Roy; Zorn, Jason
Subject: Press Release: (Revised) NRC Sends Additional Experts to Assist Japan

Attached to be released in approximately 15 minutes.

Office of Public Affairs
US Nuclear Regulatory Commission
301-415-8200
opa.resource@nrc.gov

W/99

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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Satorius, Mark

From: NRC Announcement [nrc.announcement@nrc.gov]
Sent: Tuesday, March 15, 2011 8:36 AM
To: NRC Announcement
Subject: From the Chairman: Events in Japan

NRC Daily Announcements

Tuesday, March 15, 2011 -- Headlines Web Edition

From the Chairman: Events in Japan

By now I am sure that most of you are aware of the tragic earthquake and tsunami that struck Japan last week, killing thousands of people, destroying cities and infrastructure, and knocking out large portions of the electricity grid.

I am so proud of our staff and the dedication and tenacity they have shown during the tragic events of the past several days. NRC employees have been willingly working around the clock, and their energy, experience and expertise have been invaluable to our response. Those of you who have not directly been involved in this effort are playing just as valuable a role in making sure that the facilities we license are safe and secure.

The natural disasters in Japan—and the resulting situations at the Fukushima nuclear power plant—are sobering in their size and scope. It's easy to become distracted by the stories and images of devastation and destruction. The best thing we can do in this situation is to make sure we remain mindful of our responsibilities for the safety and security of our existing nuclear plants and materials, and to keep our focus where it must always be—on our mission. I continue to appreciate your dedication to ensure the safety and security of the American people.

TOP (*2011-03-15 00:00:00.0*) View item in a new window

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