Compiled Seismic Questions for NRC Response to the March 11, 2001 Japanese Earthquake and Tsunami

This is current as of 3-16-11 at 3 am.

The keeper of this file is Annie Kammerer. Please provide comments, additions and updates to Annie with CC to Clifford Munson and Jon Ake.

A SharePoint site has been set up so that anyone can download the latest Q&As. Information will be provided as soon as we have a link to this document on line.

We greatly appreciate the assistance of the many people who have contributed. The enclosed list of questions and answers has been compiled from multiple sources including, questions forwarded from NRC staff, GI-199 communications plan, Diablo Canyon communications plan, the NEI website, lists of questions that followed the 2007 earthquake that shut down the Kashiwazaki-Kariwa plant, and others. Please do not distribute beyond the NRC.

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Natural Hazards and Ground Shaking Design Levels

1) Did the Japanese underestimate the size of the maximum credible earthquake that could affect the plants?

Public response: The magnitude of the earthquake was somewhat greater than was expected for that part of the subduction zone by seismologists worldwide. The Japanese plants were recently reviewed to ground shaking similar to that observed. The review level ground motions were expected to result from a smaller earthquake closer to the sites.

Additional, technical, non-public information: None.

2) Can a very large earthquake and tsunami happen here?

Public response: This earthquake was caused by a "subduction zone" event, which is the type of mechanism that produces the largest magnitude earthquakes. A subduction zone is a tectonic plate boundary where one tectonic plate is pushed under another plate. In the continental US, the only subduction zone is the Cascadia subduction zone which lies off the coast of northern California, Oregon and Washington. So, an earthquake and tsunami this large could only happen in that region. The only plant in that area is Columbia, which is far from the coast and the subduction zone. Outside of the Cascadia subduction zone, earthquakes are not expected to exceed a magnitude of approximate 8, which is about 10 times smaller than a magnitude 8.9.

Additional, technical, non-public information: Magnitude is on a log scale, so 9 is 10 times bigger than an 8.

3) Has this changed our perception of Earthquake risk?

Public Answer: This does not change the NRC's perception of earthquake hazard (i.e. ground shaking) at US plants. It is too early to tell what the lessons from this earthquake are from an engineering perspective. The NRC will look closely at all aspects of response of the plants to the earthquake and tsunami to determine if any actions need to be taken in US plants and if any changes are necessary to NRC regulations.

Additional, technical, non-public information: We expect that there would be lessons learned and we may need to seriously relook at common cause failures, including dam failure and tsunami.

4) What magnitude earthquake are US plants designed to?

Public Answer: Each plant is designed to a ground-shaking level that is appropriate for its location, given the possible earthquake sources that may affect the site and its tectonic environment. Ground shaking is a function of both the magnitude of an earthquake and the distance from the fault to the site. The magnitude alone cannot be used to predict ground motions. The existing plants were designed on a "deterministic" or "scenario earthquake" basis that accounted for the largest earthquake expected in the area around the plant. Several tables that include plant design ground motions are provided as the first table in the "additional information" section of this document.

Additional, technical non-public information: In the past, "deterministic" or "scenario based" analyses were used to determine ground shaking (seismic hazard) levels. Now a probabilistic method is used that accounts for possible earthquakes of various magnitudes that come from potential sources (including background seismicity) and the likelihood that each particular hypothetical earthquake occurs.

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

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

Seismic designs at U.S. nuclear power plants are developed in terms of seismic ground motion spectra, which are called the Safe Shutdown Earthquake ground motion response spectra (SSE). Each nuclear power plant is designed to a ground motion level that is appropriate for the geology and tectonics in the region surrounding the plant location. Currently operating nuclear power plants developed their SSEs based on a "deterministic" or "scenario earthquake" that accounts for the largest earthquake expected in the area around the plant.

Generally speaking, seismic activity in the regions surrounding U.S. plants is much lower than that for Japan since most U.S. plants are located in the interior of the stable continental U.S. However, the most widely felt earthquakes within the continental U.S. are the 1811-12 New Madrid sequence and the 1886 Charleston, SC, which were estimated to be between about magnitude 7.0 to 7.75. Nuclear power plants in the U.S. are sited far away from these two earthquake zones as well as other identified potential seismic sources.

On the west coast of the U.S., the two nuclear power plants are designed to specific ground motions from earthquakes of about magnitude 7+ on faults located just offshore of the plants. The earthquakes on these faults are mainly strike-slip (horizontal motion) type earthquakes, not subduction zone earthquakes. Therefore, the likelihood of a tsunami from these faults is remote.

Additional, technical non-public information: None.

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

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

Additional, technical non-public information: A table with information on tsunami design levels is provided in the "Additional Information" section of this document.

7) If the earthquake in Japan was a larger magnitude than considered by plant design, why can't the same thing happen in the US?

Public response: *Discuss in terms of, IPEEE, Seismic PRA to be provided by Nilesh*

Additional, technical, non-public information: ADD

8) If the earthquake in Japan was a larger magnitude than considered by plant design, why can't the same thing happen in the US?

Public response: *Discuss in terms of, IPEEE, Seismic PRA to be provided by Nilesh*

Additional, technical, non-public information: ADD

9) What if an earthquake like the Sendai earthquake occurred near a US plant?

Public response: *ADD*

Additional, technical, non-public information: ADD

10) What would be the results of a tsunami generated off the coast of a US plant? (Or why are we confident that large tsunamis will not occur relatively close to US shores?)

Public response: *Request for answer by Henry Jones, Goutam Bagchi and/or Richard Raione (once the tsunami fact sheet is done and you have time).*

Additional, technical, non-public information: ADD

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

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

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

Additional technical, non-public information: Currently operating reactors were designed using a "deterministic" or "maximum credible earthquake" approach. Seismic hazard for the new plants is determined using a probabilistic seismic hazard assessment approach that explicitly addresses uncertainty, as described in Regulatory Guide 1.208. The NRC requires that adequate margin beyond the design basis ground shaking levels is assured. The NRC further enhances seismic safety for beyond-design-basis events through the use of a defense-in-depth approach.

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

12) What level of earthquake hazard are the US reactors designed for?

Public Answer: Each reactor is designed for a different ground motion that is determined on a site-specific basis. The existing plants were designed on a "deterministic" or "scenario earthquake" basis that accounted for the largest earthquake expected in the area around the plant. New reactors are designed using probabilistic techniques that characterize the hazard (i.e. ground shaking levels) and uncertainty at the proposed site. Ground motions from all potential seismic sources in the region are estimated and used to develop an appropriate site specific ground motion, which has a return period of 10,000 years on average over very long time periods.

Additional technical, non-public information: None

13) Does the NRC consider earthquakes of magnitude 8.9?

Public Answer: Earthquakes with very large magnitudes, such as the recent earthquake of the coast of Japan, occur only within subduction zones. Subduction zones are regions where one of the earth's tectonic plates is subducting beneath another. In the continental US, the only subduction zone is the Cascadia subduction zone, which lies off of the coast of northern California, Oregon, and Washington. The only nuclear power plant in that area is Columbia, which is far from the coast and the subduction zone.

Seismic designs at U.S. nuclear power plants are developed in terms of seismic ground motion spectra, which are called the Safe Shutdown Earthquake ground motion response spectra (SSE). Each nuclear power plant is designed to a ground motion level that is appropriate for the geology and tectonics in the region surrounding the plant location. Currently operating nuclear power plants developed their SSEs based on a "deterministic" or "scenario earthquake" basis that account for the largest earthquake expected in the area around the plant. Seismic activity in the regions surrounding U.S. plants is much lower than that for Japan since most U.S. plants are located in the interior of the stable continental U.S. The largest earthquakes within the continental U.S. are the 1811-12 New Madrid sequence and the 1886 Charleston, SC, which were estimated to be between about magnitude 7 to 7.5. Nuclear power plants in the U.S. are sited far away from these two earthquake zones as well as other potential seismic sources. On the west coast of the U.S., the two nuclear power plants are designed to specific ground motions from earthquakes of about magnitude 7 on faults located just offshore of the plants. The earthquakes on these faults are mainly strike-slip (horizontal motion) type earthquakes, not subduction zone earthquakes. Therefore, the likelihood of a tsunami from these faults is very remote.

Additional technical, non-public information: None.

14) What are the definitions of the SSE and OBE?

CLEAN UP BELOW information – late question

From RG1.208 Safe Shutdown Earthquake Ground Motion (SSE). The vibratory ground motion for which certain structures, systems, and components are designed, pursuant to Appendix S to 10 CFR Part 50, to remain functional. The SSE for the site is characterized by both horizontal and vertical free-field ground motion response spectra at the free ground surface

Appendix S to 10 CFR Part 50 (3) has the following information: Required Plant Shutdown. If vibratory ground motion exceeding that of the Operating Basis Earthquake Ground Motion or if significant plant damage occurs, the licensee must shut down the nuclear power plant. If systems, structures, or components necessary for the safe shutdown of the nuclear power plant are not available after the occurrence of the Operating Basis Earthquake Ground Motion, the licensee must consult with the Commission and must propose a plan for the timely, safe shutdown of the nuclear power plant. Prior to resuming operations, the licensee must demonstrate to the Commission that no functional damage has occurred to those features necessary for continued operation without undue risk to the health and safety of the public and the licensing basis is maintained.

The the ratio is provided in guidance as the ratio that the licensees can chose without additional analysis. The OBE mostly used to be half for existing plants, but now it's a 1/3 unless you do analyses to show why it should be ½.

Definition of Safe Shutdown	The safe-shutdown earthquake (SSE) for the site is the ground motion response spectra (GMRS), which also satisfies the minimum requirement of paragraph IV(a)(1)(i) of Appendix S,

Earthquake	"Earthquake Engineering Criteria for Nuclear Power Plants," to Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," of the Code of Federal Regulations (10 CFR Part 50).
Definition of Operating Basis Earthquake:	To satisfy the requirements of paragraph IV(a)(2)(A) of Appendix S to 10 CFR Part 50, the operating-basis earthquake (OBE) ground motion is defined as follows: (i) For the certified design portion of the plant, the OBE ground motion is one-third of the CSDRS. (ii) For the safety-related noncertified design portion of the plant, the OBE ground motion is one-third of the design motion response spectra, as stipulated in the design certification conditions specified in design control document (DCD). (iii) The spectrum ordinate criterion to be used in conjunction with Regulatory Guide 1.166, "Pre-Earthquake Planning and Immediate Nuclear Power Plant Operator Post-earthquake Actions," issued March 1997, is the lowest of (i) and (ii).

15) What is the likelihood of the ground motions occurring over the life of the plant?

TO BE CLEANED UP BY MUNSON AND AKE

Assuming independent Poisson behavior, the relationship is---Return Period = Exposure Period/ln(1/P), where P=probability of non-exceedance, and exposure period is 50 years say. IF we plug 10,000 years for the return period we find that the probability of non-exceedance is .995, i.e. the probability of exceedance is 0.5%.

To properly emphasize the conservatism in our current process I suggest we refer to this as: our design ground motions are required to have an annual probability of exceedance of 1E-4 or less which alternatively can be viewed as a 0.5% probability of exceedance (or less) in a 50 year period.

Thanks for clarifying. I think in our effort to make this understandable that we sometimes don't consider all of the ramifications. I like using "about 0.5-1.0% probability of exceedence in 50 years" because that provides a straight comparison to the USGS hazard maps

The point you make is quite true and part of my concern. However, keep in mind we interested in the ground motions that are possibly going to happen in the design life of the plant (a few years to a few decades). We want ensure that the design ground motions have a very low probability of being exceeded (i.e. 1E-4 AFE is equal to about 0.5-1.0% probability of exceedence in 50 years). Use of the "10,000 year ground motion" invites goofy questions like "how can we guarantee consistency in seismic/tectonic characteristics over 10,000 or 100,000 years?", as well as potential sampling issues, i.e. how do we sample a few years and estimate behavior over 10,000? I think it best to just leave it at 1E-4 or 0.5% in 50 years or some way to express it that is consistent with our intended use.

16) What is magnitude anyway? What is the Richter Scale? What is intensity?

17)

Design Against Natural Hazards & Plant Safety in the US

18) Are power plants designed for Tsunami's?

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

Additional, technical, non-public information: Tsunami are considered in the design of US nuclear plants. Nuclear plants are designed to withstand flooding from not only tsunami, but also hurricane and storm surge; therefore there is often significant margin against tsunami flooding. However, it should be noted that Japanese experience has shown that drawdown can be a significant problem.

Currently the US NRC has a tsunami research program that is focused on developing modern hazard assessment techniques and additional guidance through cooperation with the National Oceanic and Atmospheric Administration and the United States Geological Survey. This has already lead to several technical reports and an update to NUREG 0-800. The NOAA and USGS contractors are also assisting with NRO reviews of tsunami hazard. A new regulatory guide on tsunami hazard assessment is currently planned in the office of research, although it is not expected to be available in draft form until 2012.

19) What level of Tsunami are we designed for?

Public Answer: Like seismic hazard, the level of tsunami that each plant is designed for is site-specific and is appropriate for what may occur at each location.

Additional, technical, non-public information: None.

20) How was the seismic design basis for an existing nuclear power plant established?

Public Answer: The seismic ground motion used for the design basis was determined from the evaluation of the maximum historic earthquake within 200 miles of the site, without explicitly considering the time spans between such earthquakes; safety margin was then added beyond this maximum historic earthquake to form a hypothetical *design basis earthquake*. The relevant regulation for currently operating plants is 10 CFR Part 100, Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants" (http://www.nrc.gov/reading-rm/doc-collections/cfr/part100/part100-appa.html).

Additional, technical, non-public information: See discussion at end of GI-199 section for discussion of safety margin and design basis.

21) Is there margin above the design basis?

Public Answer: Yes, there is margin beyond the design basis). In the mid to late 1990s, NRC staff reviewed the plants' assessments of potential consequences of severe earthquakes (earthquakes beyond the safety margin included in each plant's design basis), which licensees performed as part of the Individual Plant Examination of External Events (or IPEEE) program. From this review, the staff determined that seismic designs of operating plants in the United States have adequite safety margins, for withstanding earthquakes, built into the designs.

Additional, technical, non-public information: None.

22) Are US plants safe?

Public Answer: US plants are designed for appropriate earthquake shaking levels and are safe. Currently the NRC is also conducting a program called Generic Issue 199, which is reviewing the adequacy of earthquake design of US NPPs in the central and eastern North America based on the latest data and analysis techniques.

Additional, technical, non-public information: None.

23) Was the Japanese plant designed for this type of accident? Are US plants?

Public Answer: Plants in both the US and Japan area designed for earthquake shaking. In addition to the design of the plants, significant effort goes into emergency response planning and accident mitigation. This approach is called defense-in-depth.

Additional, technical, non-public information: None.

24) Why do we have confidence that US nuclear power plants are adequately designed for earthquakes and tsunamis?

Public Answer: Plants in both the US and Japan area designed for earthquake shaking. In addition to the design of the plants, significant effort goes into emergency response planning and accident mitigation. This approach is called defense-in-depth.

Additional, technical, non-public information: None.

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

Public Answer: All U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes and tsunamis. Even those plants that are located within areas with low and moderate seismic activity are designed for safety in the event of such a natural disaster. The NRC requires that safety-significant structures, systems, and components be designed to take into account even rare and extreme seismic and tsunami events Nuclear power plants are designed to be safe based on the most severe natural phenomena historically reported for the site and surrounding area. The Japanese facilities are similar in design to several US facilities.

Additional technical, non-public information: Currently operating reactors were designed using a "deterministic" or "maximum credible earthquake" approach. Seismic hazard for the new plants is determined using a probabilistic seismic hazard assessment approach that explicitly addresses uncertainty, as described in Regulatory Guide 1.208. The NRC requires that adequate margin beyond the design basis ground shaking levels is assured. The NRC further enhances seismic safety for beyond-design-basis events through the use of a defense-in-depth approach.

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

The reactor design is a Boiling Water Reactor that is similar to some U.S. designs, including Oyster Creek, Nine Mile Point and Dresden Units 2 and 3.

26) Are US plants susceptible to the same sort of loss of all power?

Public response: *ADD. Can someone discuss how we deal with station blackout? I need help with this one...*

Additional, technical, non-public information: ADD

27) Could an accident like the one at Japan's Fukushima Daiichi nuclear plant happen in the United States?

Public response: It is difficult to answer this question until we have a better understanding of the precise problems and conditions that faced the operators at Fukushima Daiichi. We do know, however, that Fukushima Daiichi Units 1-3 lost all offsite power and emergency diesel generators. This situation is called "station blackout." U.S. nuclear power plants are designed to cope with a station blackout event that involves a loss of offsite power and onsite emergency power. The Nuclear Regulatory Commission's detailed regulations address this scenario. U.S. nuclear plants are required to conduct a "coping" assessment and develop a strategy to demonstrate to the NRC that they could maintain the plant in a safe condition during a station blackout scenario. These assessments, proposed modifications and operating procedures were reviewed and approved by the NRC. Several plants added additional AC power sources to comply with this regulation.

In addition, U.S. nuclear plant designs and operating practices since the terrorist events of September 11, 2001, are designed to mitigate severe accident scenarios such as aircraft impact, which include the complete loss of offsite power and all on-site emergency power sources.

U.S. nuclear plant designs include consideration of seismic events and tsunamis'. It is important not to extrapolate earthquake and tsunami data from one location of the world to another when evaluating these natural hazards. These catastrophic natural events are very region- and location-specific, based on tectonic and geological fault line locations.

Additional technical, non-public information: None

28) Should U.S. nuclear facilities be required to withstand earthquakes and tsunamis of the kind just experienced in Japan? If not, why not?

Public response: U.S. nuclear reactors are designed to withstand an earthquake equal to the most significant historical event or the maximum projected seismic event and associated tsunami without any breach of safety systems.

The lessons learned from this experience must be reviewed carefully to see whether they apply to U.S. nuclear power plants. It is important not to extrapolate earthquake and tsunami data from one location of the world to another when evaluating these natural hazards, however. These catastrophic natural events are very region- and location-specific, based on tectonic and geological fault line locations.

The U.S. Geological Survey (USGS) conducts continuous research of earthquake history and geology, and publishes updated seismic hazard curves for various regions in the continental US. These curves are updated approximately every six years. NRC identified a generic issue (GI-199) that is currently undergoing an evaluation to assess implications of this new information to nuclear plant sites located in the central and eastern United States. The industry is working with the NRC to address this issue.

Additional technical, non-public information: None

29) Can you summarize the plant seismic design basis for the US plants? Are there any special issues associated with seismic design?

Public response: Please see one of the several tables provided in the "Additional information" section of this document

Additional, technical, non-public information: None

30) How do we know that the equipment in plants is safe in earthquakes?

Public response: All equipment important to safety (required to safely shutdown a nuclear power plant) is qualified to withstand earthquakes in accordance with plants' licensing basis and NRC regulations.

Additional, technical, non-public information: 10 CFR 50, Appendix A, General Design Criterion 2 and 4, 10 Part 100, and Appendix S. Guidance: Regulatory Guides 1.100, IEEE 344 and ASME QME-1

31) How do we know equipment will work if the magnitude is bigger than expected, like in Japan?

Public response: Plant systems are designed to mitigate a design basis earthquake which includes margin above the postulated site specific earthquake. (reviewers comment: this needs to be expanded)

Additional, technical, non-public information: See part 100 Reactor Site Criteria

32) Are US plants susceptible to the same kind of loss of power as happened in Japan?

Public response: Yes in the sense that sites can lose offsite power. Also, hurricane or tornado related high winds may potentially damage the transmission network in the vicinity of a nuclear plant. Flood waters can also 'affect transformers used to power station auxiliary system. These types of weather related events have the potential to degrade the offsite power source to a plant.

The onsite Emergency Diesel Generators need fuel oil stored in tanks that are normally buried underground. These tanks and associated pumps/piping require protection from the elements.

Above ground tanks have tornado/missile protection.

In case both offsite and onsite power supplies fail, NRC has required all licensee to evaluate for a loss of all AC power (station blackout) scenario and implement coping measures to safely shutdown the plant law 10 CFR 50.63.

Additional, technical, non-public information: Some plants have safeguards equipment below sea level and rely on watertight doors or Bilge pumps to remove water from equipment required to support safe shutdown. Overflowing rivers can result in insurmountable volume of water flooding the vulnerable areas.

33) How do we know that the EDGs in Diablo Canyon and SONGS will not fail to operate like in Japan?

Public response: EDGs are installed in a seismically qualified structure. Even if these EDGs fail, plants can safely shutdown using station blackout power source law 10 CFR 50.63.

Additional, technical, non-public information: None.

34) Is all equipment at the plant vulnerable to tsunami?

Public response: Plants are designed law GDC 2 to withstand protection against natural phenomena such as tsunami, earthquakes. (reviewers comment: this needs to be expanded. I need assistance with this)

Additional, technical, non-public information: ADD

35) What protection measures do plants have against tsunami?

Public response: Plants are designed iaw GDC 2 to withstand protection against natural phenomena such as tsunami, earthquakes. (note from reviewer: add information on breakwater from songs and Diablo example. I need assistance with this)

Additional, technical, non-public information: ADD

36) Is there a risk of loss of water during tsunami drawdown? Is it considered in design?

Public response: *Goutam, Henry and Rich, can you guys answer this?*

Additional, technical, non-public information: ADD

37) Are nuclear buildings built to withstand earthquakes? What about tsunami?

Public response: *There is language elsewhere in this document that answers that...copy here.*

Additional, technical, non-public information: ADD

38) Are aftershocks considered in the design of equipment at the plants? Are aftershocks considered in design of the structure?

Public response: ADD

Additional, technical, non-public information: ADD

39) Are there any special issues associated with seismic design at the plants? For example, Diablo Canyon has special requirements. Are there any others?

Public response: Both SONGS and Diablo canyon are licensed with an automatic trip for seismic events. *(can this be expanded? any others?) Mike Markley, can your group assist with this?*

Additional, technical, non-public information: ADD

40) Is the NRC planning to require seismic isolators for the next generation of nuclear power plants? How does that differ from current requirements and/or precautions at existing U.S. nuclear power plants?

Public response: The NRC would not require isolators for the next generation of plants. However, it is recognized that a properly designed isolation system can be very effective in mitigating the effect of earthquake. Currently the NRC is preparing guidance for plant designers considering the use of seismic isolation devices.

Additional, technical, non-public information: A NUREG is in the works in the office of research. It is expected to be available for comment in 2011.

41) Are there any U.S. nuclear power plants that incorporate seismic isolators? What precautions are taken in earthquake-prone areas?

Public response: No currently constructed nuclear power plants in the US use seismic isolators. However seismic isolation is being considered for a number of reactor designs under development. Currently seismic design of plants is focused on assuring that design of structures, systems, and components are designed and qualified to assure that there is sufficient margin beyond the design basis ground motion.

Additional, technical, non-public information: None.

42) Do you think that the recent Japan disaster will cause any rethinking of the planned seismic isolation guidelines, particularly as it regards earthquakes and secondary effects such as tsunamis?

Public response: Whenever an event like this happens, the NRC thoroughly reviews the experience and tries to identify any lessons learned. The NRC further considers the need to change guidance or regulations. In this case, the event will be studied and any necessary changes will be made to the guidance under development. However, it should be noted that Japan does not have seismically isolated nuclear plants.

Additional, technical, non-public information: None.

About Japanese Hazard, Design and Earthquake Impact

43) Was the damage done to the plants from the Earthquake or the Tsunami?

Public response: It is hard to tell at this point. In the nuclear plants there seems to have been some damage from the shaking. However, the tsunami lead to some of the biggest problems in terms of the loss of backup power. This is also true in the general population; the tsunami seems to have lead to most of the deaths.

Additional, technical, non-public information: None

44) What is the design level of the Japanese plants? Was it exceeded?

Public response: As a result of a significant change in seismic regulations in 2006, the Japanese regulator initiated a program to reassess seismic hazard and seismic risk for all nuclear plants in Japan. This resulted in new assessments of higher ground shaking levels (i.e. seismic hazard) and a review of seismic safety for all Japanese plants. The program is still on-going, but has already resulted in retrofit in some plants. Therefore, it is useful to discuss both the design level and a review level ground motion for the plants, as shown below.

Currently we do not have official information. However, it appears that the ground motions (in terms of peak ground acceleration) are similar to the S_s shaking levels, although the causative earthquakes are different. Thus the design basis was exceeded, but the review level may not have been.

Table: Original Design Basis Ground Motions (S_2) and New Review Level Ground Motions (S_s) Used for Review of Japanese Plants

Plant sites	Contributing earthquakes used for determination of hazard	New DBGM S_s	Original DBGM S_1
Onagawa	Soutei Miyagiken-oki (M8.2)	580 gal (0.59g)	375 gal (0.38g)
Fukushima	Earthquake near the site (M7.1)	600 gal (0.62g)	370 gal (0.37g)
Tokai	Earthquakes specifically undefined	600 gal (0.62g)	380 gal (0.39g)
Hamaoka	Assumed Tokai (M8.0), etc.	800 gal (0.82g)	600 gal (0.62g)

Additional, technical, non-public information: None

45) What are the Japanese S_1 and S_s ground motions and how are they determined?

Public response: Japanese nuclear power plants are designed to withstand specified earthquake ground motions, previously specified as S_1 and S_2, but now simply S_s. The design basis earthquake ground motion S_1 was defined as the largest earthquake that can reasonably be expected to occur at the site of a nuclear power plant, based on the known seismicity of the area and local faults that have shown activity during the past 10,000 years. A power reactor could continue to operate safely during an S_1 level earthquake, though in practice they are set to trip at lower levels. The S_2 level ground motion was based on a larger earthquake from faults that have shown activity during the past 50,000 years and assumed to be closer to the site. The revised seismic regulations in May 2007 replaced S_1 and S_2 with S_s.

The S_S design basis earthquake is based on evaluating potential earthquakes from faults that have shown activity during the past 130,000 years. The ground motion from these potential earthquakes are simulated for each of the sites and used to determine the revised S_S design basis ground motion level. Along with the change in definition, came a requirement to consider "residual risk", which is a consideration of the beyond-design-basis event.

Additional, technical, non-public information: None

46) Did this earthquake affect Kashiwazaki-Kariwa NPP?

Public response: No, this earthquake did not affect Kashiwazaki-Kariwa NPP and all reactors remained in their pre-earthquake operating state. It also did not trip during an earthquake of magnitude XX that occurred on the western side subsequent to the 8.9 earthquake. This is very important for the stability of Japan's energy supply due to the loss of production at TEPCO's Fukushima NPPs.

Additional, technical, non-public information: None

47) How high were the tsunami at the plants?

Public response: The actual tsunami height at the plants is not currently known. However, NOAA has publically information on the recordings at sea for many areas.

Additional, technical, non-public information: A preliminary rough estimate of tsunami height at the plant locations was provided to NRC by NOAA shortly after the earthquake. This was developed using NOAA's global ocean model and is shown in the "additional information" section. Most notably, there was a 6 meter wave at Fukushima and the wave at Onogawa may have been between 18 and 23 meters.

What happened in US Plants during the earthquake?

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

Public Answer: No

Additional, technical non-public information: Two US plants on the Pacific Ocean (Diablo Canyon and San Onofre) experienced higher than normal sea level due to tsunami. However, the wave heights were consistent with previously predicted levels and this had no negative impact to the plants. In response, Diablo Canyon Units 1 and 2 declared an "unusual event" based on tsunami warning following the Japanese earthquake. They have since exited the "unusual event" declaration, based on a downgrade to a tsunami advisory.

49) Have any lessons for US plants been identified?

Public Answer: The NRC is in the process of following and reviewing the event in real time. This, inevitably, leads to the indemnification of lessons that warrant further study. However, a complete understanding of lessons learned requires more information than is currently available to NRC staff.

Additional, technical non-public information: We need to take a closer look at common cause failures, such as earthquake and tsunami, and earthquake and dam failure.

Future Actions, Reassessment of US Plants and GI-199

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

Public Answer: We are closely following events in Japan, working with other agencies of the federal government, and have been in direct contact with our counterparts in that country. In addition, we are ready to provide assistance if there is a specific request. An NRC staffer is participating in the USAID team headed to Japan.

Additional technical, non-public information: We are taking the knowledge that the staff has about the design of the US nuclear plants and we are applying this knowledge to the Japan situation. For example, this includes calculations of severe accident mitigation that have been performed.

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

Public Answer: During design certification, vendors propose a seismic design in terms of a ground motion spectrum for their nuclear facility. This spectrum is called a standard design response spectrum and is developed so that the proposed nuclear facility can be sited at most locations in the central and eastern United States. The vendors show that this design ground motion is suitable for a variety of different subsurface conditions such as hard rock, deep soil, or shallow soil over rock. Combined License and Early Site Permits applicants are required to develop a site specific ground motion response spectrum that takes into account all of the earthquakes in the region surrounding their site as well as the local site geologic conditions. Applicants estimate the ground motion from these postulated earthquakes to develop seismic hazard curves. These seismic hazard curves are then used to determine a site specific ground motion response spectrum that has a maximum annual likelihood of $1x10^{-4}$ of being exceeded. This can be thought of as a ground motion with a 10,000 year return period. This site specific ground motion response spectrum is then compared to the standard design response spectrum for the proposed design. If the standard design ground motion spectrum envelopes the site specific ground motion spectrum then the site is considered to be suitable for the proposed design. If the standard design spectrum does not completely envelope the site specific ground motion spectrum, then the COL applicant must do further detailed structural analysis to show that the design capacity is adequate. Margin beyond the standard design and site specific ground motions must also be demonstrated before fuel loading can begin.

Additional technical, non-public information: None.

52) Is the earthquake safety of US plants reviewed once the plants are constructed?

Public response: Yes, earthquake safety is reviewed during focused design inspections, under the Generic Issues Program (GI-199) and as part of the Individual Plant Evaluation of External Events program (IPEEE) that was conducted in response to Generic Letter 88-20 Supplement 4.

Additional, technical, non-public information: None.

53) Does the NRC ever review tsunami risk for existing plants?

Public Answer: The NRC has not conducted a generic issue program on tsunami risk to date. However, some plants have been reviewed as a result of the application for a license for a new reactor. In the ASME/ANS 2009 seismic probabilistic risk assessment standard, all external hazards are included.

Additional, technical, non-public information: None.

54) Does GI-199 consider tsunami?

Public response: GI-199 stems from the increased in perceived seismic hazard focused on understanding the impact of increased ground motion on the risk at a plant. GI-199 does not consider tsunami

Additional, technical, non-public information: In the past there has been discussion about a GI program on tsunami, but the NRC's research and guidance was not yet at the point it would be effective. We are just getting to this stage and the topic should be revisited.

55) What is Generic Issue 199 about?

Public Answer: Generic Issue 199 investigates the safety and risk implications of updated earthquake-related data and models. These data and models suggest that the probability for earthquake ground shaking above the seismic design basis for some nuclear power plants in the Central and Eastern United States is still low, but larger than previous estimates.

Additional, technical, non-public information: See additional summary/discussion of GI-199 and terms below.

56) Where can I get current information about Generic Issue 199?

Public Answer: The public NRC Generic Issues Program (GIP) website (http://www.nrc.gov/about-nrc/regulatory/gen-issues.html) contains program information and documents, background and historical information, generic issue status information, and links to related programs. The latest Generic Issue Management Control System quarterly report, which has regularly updated GI-199 information, is publicly available at http://www.nrc.gov/reading-rm/doc-collections/generic-issues/quarterly/index.html. Additionally, the U.S. Geological Survey provides data and results that are publicly available at http://earthquake.usgs.gov/hazards/products/conterminous/2008/.

Additional, technical, non-public information: The GI-199 section of the NRC internal GIP website (http://www.internal.nrc.gov/RES/projects/GIP/Individual%20GIs/GI-0199.html) contains additional information about Generic Issue 199 (GI-199) and is available to NRC staff.

57) How was the seismic design basis for an existing nuclear power plant established?

Public Answer: The seismic ground motion used for the design basis was determined from the evaluation of the maximum historic earthquake within 200 miles of the site, without explicitly considering the time spans between such earthquakes; safety margin was then added beyond this

maximum historic earthquake to form a hypothetical *design basis earthquake*. The relevant regulation for currently operating plants is 10 CFR Part 100, Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants" (http://www.nrc.gov/reading-rm/doc-collections/cfr/part100/part100-appa.html).

Additional, technical, non-public information: See discussion at end of GI-199 section for discussion of safety margin and design basis.

58) Is there margin above the design basis?

Public Answer: Yes, there is margin beyond the design basis. In the mid to late 1990s, NRC staff reviewed the plants' assessments of potential earthquakes beyond the safety margin included in each plant's design basis), which licensees performed as part of the Individual Plant Examination of External Events (or IPEEE) program. From this review, the staff determined that seismic designs of operating plants in the Central and Eastern United States have considerable safety margins, for withstanding earthquakes, built into the designs.

Additional, technical, non-public information: The goal of seismic engineering is to design structures, systems and components that explicitly do not fail at the design level. The application of specific codes, standards, and analysis techniques results in margin beyond the design level. The assessments carried out as part of the IPEEE program demonstrated that margin exists in the operating reactors against seismic demand.

59) Are all U.S. plants being evaluated as a part of Generic Issue 199?

Public Answer: The scope of the Generic Issue 199 (GI-199) Safety/Risk Assessment is limited to all plants in the Central and Eastern United States. Although plants at the Columbia, Diablo Canyon, Palo Verde, and San Onofre sites are not included in the GI-199 Safety/Risk Assessment, the Information Notice on GI-199 is addressed to all operating power plants in the U.S. (as well as all independent spent fuel storage installation licensees). The staff will also consider inclusion of operating reactors in the Western U.S. in its future generic communication information requests.

Additional, technical, non-public information: The staff is currently developing specific information needs to be included in a Generic Letter to licensees in the CEUS.

60) Are the plants safe? If you are not sure they are safe, why are they not being shut down? If you are sure they are safe, why are you continuing evaluations related to this generic issue?

Public Answer: Yes, currently operating nuclear plants in the United States remain safe, with no need for immediate action. This determination is based on NRC staff reviews associated with Early Site Permits and updated seismic hazard information, the conclusions of the Generic Issue 199 Screening Panel (comprised of technical experts), and the conclusions of the Safety/Risk Assessment Panel (also comprised of technical experts).

No immediate action is needed because: (1) existing plants were designed to withstand anticipated earthquakes with substantial design margins, as confirmed by the results of the Individual Plant Examination of External Events program; (2) the probability of exceeding the *safe shutdown earthquake* ground motion may have increased at some sites, but only by a relatively small amount; and (3) the Safety/Risk Assessment Stage results indicate that the probabilities of seismic core damage are lower than the guidelines for taking immediate action.

Even though the staff has determined that existing plants remain safe, the Generic Issues Program criteria (Management Directive 6.4) direct staff to continue their analysis to determine whether any cost-justified plant improvements can be identified to make plants enhance plant safety.

Additional, technical, non-public information : The Safety/Risk Assessment results confirm that plants are safe. The relevant risk criterion for GI-199 is total *core damage frequency* (CDF). The threshold for taking immediate regulatory action (found in NRR Office Instruction LIC-504, see below) is a total CDF greater than or on the order of 10^{-3} (0.001) per year. For GI-199, the staff calculated seismic CDFs of 10^{-4} (0.0001) per year and below for nuclear power plants operating in the Central and Eastern U.S. (CEUS) (based on the new U.S. Geological Survey seismic hazard curves). The CDF from internal events (estimated using the staff-developed Standardized Plant Analysis of Risk models) and fires (as reported by licensees during the IPEEE process and documented in NUREG-1742), when added to the seismic CDF estimates results in the total risk for each plant to be, at most, 4×10^{-4} (0.0004) per year or below. This is well below the threshold (a CDF of 10^{-3} [0.001] per year) for taking immediate action. Based on the determination that there is no need for immediate action, and that this issue has not changed the licensing basis for any operating plant, the CEUS operating nuclear power plants are considered safe. In addition, as detailed in the GI-199 Safety/Risk Assessment there are additional, qualitative considerations that provide further support to the conclusion that plants are safe.

Note: The NRC has an integrated, risk-informed decision-making process for emergent reactor issues (NRR Office Instruction LIC-504, ADAMS Accession No. ML100541776 [not publically available]). In addition to deterministic criteria, LIC-504 contains risk criteria for determining when an emergent issue requires regulatory action to place or maintain a plant in a safe condition.

61) What do you mean by "increased estimates of seismic hazards" at nuclear power plant sites?

Public Answer: *Seismic hazard* (earthquake hazard) represents the chance (or probability) that a specific level of ground shaking could be observed or exceeded at a given location. Our estimates of seismic hazard at some Central and Eastern United States locations have changed based on results from recent research, indicating that earthquakes occurred more often in some locations than previously estimated. Our estimates of seismic hazard have also changed because the models used to predict the level of ground shaking, as caused by a specific magnitude earthquake at a certain distance from a site, changed. The increased estimates of seismic hazard at some locations in the Central and Eastern United States were discussed in a memorandum to the Commission, dated July 26, 2006. (The memorandum is available in the NRC Agencywide Documents Access and Management System [ADAMS] under Accession No. ML052360044).

Additional, technical, non-public information: See additional discussion of terms below.

62) What do the following terms mean?

- Annual exceedance frequency
- Core damage frequency
- Design basis earthquake or safe shutdown earthquake
- Ground acceleration
- High confidence of low probability of failure capacity
- Large early release frequency
- Seismic hazard
- Seismic margin
- Seismic risk

Public Answer: The terms are defined as follows:

Annual exceedance frequency (AEF) – Number of times per year that a site's ground motion is expected to exceed a specified acceleration.

Core damage frequency (CDF) – **Expected number of core damage events per unit of time.** *Core damage* refers to the uncovery and heat-up of the reactor core, to the point that prolonged oxidation and severe fuel damage are not only anticipated but also involve enough of the core to result in off-site public health effects if released. *Seismic core damage frequency* refers to the component of total CDF that is due to seismic events.

Design basis earthquake* or *safe shutdown earthquake (SSE) – A *design basis earthquake* is a commonly employed term for the *safe shutdown earthquake (SSE)*; the SSE is the earthquake ground shaking for which certain structures, systems, and components are designed to remain functional. In the past, the SSE has been commonly characterized by a standardized spectral shape associated with a peak *ground acceleration* value.

Ground acceleration – Acceleration produced at the ground surface by seismic waves, typically expressed in units of *g*, the acceleration of gravity at the earth's surface.

High confidence of low probability of failure (HCLPF) capacity – A measure of *seismic margin*. In *seismic risk* assessment, *HCLPF capacity* is defined as the earthquake motion level, at which there is high confidence (95%) of a low probability (at most 5%) of failure of a structure, system, or component.

Large early release frequency (LERF) – The expected number of large early releases per unit of time. A *large early release* is the rapid, unmitigated release of airborne fission products from the containment building to the environment, occurring before the effective implementation of off-site emergency response and protective actions, such that there is a potential for early health effects. *Seismic large early release frequency* refers to the component of total LERF that is due to seismic events.

Seismic hazard – Any physical phenomenon, such as ground motion or ground failure, that is associated with an earthquake and may produce adverse effects on human activities (such as posing a risk to a nuclear facility).

Seismic margin – The difference between a plant's capacity and its seismic design basis (*safe shutdown earthquake, or SSE*).

Seismic risk – The risk (frequency of occurrence multiplied by its consequence) of severe earthquake-initiated accidents at a nuclear power plant. A severe accident is an accident that causes core damage, and, possibly, a subsequent release of radioactive materials into the environment. Several risk metrics may be used to express *seismic risk*, such as seismic *core damage frequency* and seismic *large early release frequency*.

63) Let's say there's an estimate expressed as "2.5E-06." (I'm looking at Table D-2 of the safety/risk assessment of August 2010.) I believe that this expression means the same as 2.5 x 10^-06, or 0.0000025, or 2.5 divided by one million. In layman's terms, that means an expectation, on average, of 2.5 events every million years, or once every 400,000 years. Similarly, "2.5E-05" would be 2.5 divided by 100,000, or 2.5 events every 100,000 years, on average, or once every 40,000 years. Is this correct?

Public Response: Yes, at least partly. In the subject documents the frequencies for core damage or ground motion exceedance have been expressed in the form "2.5E-06". As you noted this is equivalent to 2.5x10-6, or 0.000025 per year. If, for example, the core damage frequency was estimated as 2.5E-06, this would be equivalent to an expectation of 2.5 divided by a million per year. It is not really correct to think of these values as "once every 400,000 years," the two numbers are mathematically equivalent but do not convey the same statistical meaning within this context. Rather, you could characterize it as 1 in 400,000 per year of something occurring.

Additional, technical, non-public information: None

64) The GI-199 documents give updated probabilistic seismic hazard estimates for existing nuclear power plants in the Central and Eastern U.S. What document has the latest seismic hazard estimates (probabilistic or not) for existing nuclear power plants in the Western U.S.?

Public Response: At this time the staff has not formally developed updated probabilistic seismic hazard estimates for the existing nuclear power plants in the Western U.S. However, NRC staff during the mid- to late-1990's reviewed the plants' assessments of potential consequences of severe ground motion from earthquakes beyond the plant design basis as part of the Individual Plant Examination of External Events (IPEEE) program. From this review, the NRC staff determined that the seismic designs of operating plants in the U.S. have adequate safety margin. NRC staff has continued to stay abreast of the latest research on seismic hazards in the Western U.S. and interface with colleagues at the U.S. Geological Survey. The focus of Generic Issue 199 has been on the CEUS. However, the Information Notice that summarized the results of the Safety/Risk Assessment was sent to all existing power reactor licensees. The documents that summarize existing hazard estimates are contained in the Final Safety Analysis Reports (FSARS) and in the IPEEE submittals. It must be noted that following 9/11 the IPEEE documents are no longer publicly available.

Additional, technical, non-public information: None

65) The GI-199 documents refer to newer data on the way. Have NRC, USGS et al. released those? I'm referring to this: "New consensus seismic-hazard estimates will become available in late 2010 or early 2011 (these are a product of a joint NRC, U.S. Department of Energy, U.S. Geological Survey (USGS) and Electric Power Research Institute (EPRI) project). These consensus seismic hazard estimates will supersede the existing EPRI, Lawrence Livermore National Laboratory, and USGS hazard estimates used in the GI-199 Safety/Risk Assessment."

Public Response: The new consensus hazard curves are being developed in a cooperative project that has NRC, U.S. Department of Energy, U.S. Geological Survey (USGS) and Electric Power Research Institute (EPRI) participation. The title is: the Central and Eastern U.S. Seismic Source Characterization (CEUS-SSC) project. The project is being conducted following comprehensive standards to ensure quality and regulatory defensibility. It is in its final phase and is expected to be publicly released in the fall of 2011. The project manager is Larry Salamone (Lawrence.salamone@srs.gov, 803-645-9195) and the technical lead on the project is Dr. Kevin Coppersmith (925-974-3335, kcoppersmith@earthlink.net).

Additional information on this project can be found at: http://mydocs.epri.com/docs/ANT/2008-04.pdf, and http://my.epri.com/portal/server.pt?open=512&objID=319&&PageID=218833&mode=2&in_hi_userid=2&cached=true.

Additional, technical, non-public information: None

66) What is the timetable now for consideration of any regulatory changes from the GI-199 research?

Public Response: The NRC is working on developing a Generic Letter (GL) to request information from affected licensees. The GL will likely be issued in a draft form within the next 2 months to stimulate discussions with industry in a public meeting. After that it has to be approved by the Committee to Review Generic Requirements, presented to the Advisory Committee on Reactor Safeguards and issued as a draft for formal public comments (60 days). After evaluation of the public comments it can then be finalized for issuance. We expect to issue the GL by the end of this calendar year, as the new consensus seismic hazard estimates become available. The information from licensees will likely require 3 to 6 months to complete. Staff's review will commence after receiving licensees' responses. Based on staff's review, a determination can be made regarding cost beneficial backfits where it can be justified.

Additional, technical, non-public information: None

Seismic Probabilistic Risk Assessment (SPRA)

67) The NRC increasingly uses risk-information in regulatory decisions. Are risk-informed PRAs useful in assessing an event such as this?

Public response: Nilesh Chokshi to provide Q&As on SPRA

Additional, technical, non-public information: None

Plant-Specific Questions

SONGS questions

Note, these were added 3/15 and have not yet been reviewed.

68) SONGS received a white finding in 2008 for 125VDC battery issue related to the EDGs that went undetected for 4 years. NRC issued the white finding as there was increased risk that one EDG may not have started due to a low voltage condition on the battery on one Unit (Unit 2). Aren't all plants susceptible to the unknown? Is there any assurance the emergency cooling systems will function as desired in a Japan-like emergency?

Public response: The low voltage condition was caused by a failure to properly tighten bolts on a electrical breaker that connected the battery to the electrical bus that would be relied on to start the EDG in case of a loss of off-site power. This was corrected immediately on identification and actions taken to prevent its reoccurrence. The 3 other EDGs at SONGS were not affected.

Additional, technical, non-public information: None

69) Has the earthquake hazard at SONGS been reviewed like DCNPP is doing? Are they planning on doing an update before relicensing?

Public Answer: Relicensing does not evaluate the potential change to seismic siting of a plant. If there is a seismic design concern, it would be addressed for the plant as it is currently operating.

The closest active fault is approximately five miles offshore from San Onofre, a system of folds and faults exist called the OZD. The Cristianitos fault is ½ mile southeast, but is an inactive fault. Other faults such as the San Andreas and San Jacinto, which can generate a larger magnitude earthquake, are far enough away that they would produce ground motions less severe than the OZD for San Onofre.

Past history relative to nearby major quakes have been of no consequences to San Onofre. In fact, three major earthquakes from 1992 to 1994 (Big Bear, Landers and Northridge), ranging in distance from 70-90 miles away and registering approximately 6.5 to 7.3 magnitude, did not disrupt power production at San Onofre. The plant is expected to safely shutdown if a major earthquake occurs nearby. Safety related structures, systems and components have been designed and qualified to remain functional and not fail during and after an earthquake.

Additional, technical, non-public information: None

70) Is possible to have a tsunami at songs that is capable of damaging the plant?

Public Information: The San Onofre Units 2 and 3 plant grade is elevation +30.0 feet MLLW. The controlling tsunami for San Onofre occurring during simultaneous high tide and storm surge produces a maximum runup to elevation +15.6 feet MLLW at the Unit 2 and 3 seawall. When storm waves are superimposed, the predicted maximum runup is to elevation +27 MLLW. Tsunami protection for the SONGS site is provided by a reinforced concrete seawall constructed to elevation +30.0 MLLW. A tsunami greater than this height is extremely unlikely.

Additional, technical, non-public information: None

71) Does SONGS have an emergency plan for tsunami?

Public Response: The SONGS emergency plan does initiate the emergency response organization and results in declaration of emergency conditions via their EALs. The facility would then make protective

action recommendations to the Governor, who would then decide on what protective actions would be ordered for the residents around SONGS.

Additional, technical, non-public information: None

72) Has evacuation planning at SONGS considered tsunami?

Public Response: These considerations would be contained in the State and local (City, County) emergency plans, which are reviewed by FEMA. FEMA then certifies to the NRC that they have "reasonable assurance" that the off-site facilities can support operation of SONGS in an emergency.

Additional, technical, non-public information: None

73) Is SONGS designed against tsunami and earthquake?

Public Response: Yes. SONGS is designed against both tsunami and earthquake.

Additional, technical, non-public information: None

74) What is the height of water that SONGS is designed to withstand?

Public Response: 30 feet. Information for all plants can be found in the "Additional Information' section of this document.

Additional, technical, non-public information: None

75) What about drawdown and debris?

Public Response: *Good question...can HQ answer? Goutam, Henry, or Rich...can you help with this one?*

Additional, technical, non-public information: None

76) Will this be reviewed in light of the Japan quake.

Public Response: The NRC will do a through assessment of the lessons learned from this event and will review all potential issues at US nuclear plants as a result.

Additional, technical, non-public information: None

77) Could all onsite and offsite power be disrupted from SONGS in the event of a tsunami, and if that happened, could the plant be safely cooled down if power wasn't restored for days after?

Public Response: Seismic Category I equipment is equipment that is essential to the safe shutdown and isolation of the reactor or whose failure or damage could result in significant release of radioactive material. All Seismic Category I equipment at SONGS is designed to function following a DBE with ground acceleration of 0.67g.

The operating basis earthquake (1/2 of the DBE) is characterized by maximum ground shaking of 0.33g. Historically, even this level of ground shaking has not been observed at the site. Based on expert analysis, the average recurrence interval for 0.33g ground shaking at the San Onofre site would be in excess of 1000 years and, thus, the probability of occurrence in the 40-year design life of the plant would be less than 1 in 25. The frequency of the DBE would be much more infrequent, and very unlikely to occur during the life of the plant. Even if an earthquake resulted in greater than the DBE movement/acceleration at SONGS, the containment structure would ultimately protect the public from harmful radiation release, in the event significant damage occurred to Seismic category 1 equipment.

Additional, technical, non-public information: None

78) Are there any faults nearby SONGS that could generate a significant tsunami?

Public Response: Current expert evaluations estimate a magnitude 7 earthquake about 4 miles from SONGS. This is significantly less than the Japan quake, and SONGS has been designed to withstand this size earthquake without incident. Should discuss the different tectonic nature (not a subduction zone like Japan)?

Additional, technical, non-public information: None

79) What magnitude or shaking level is SONGS designed to withstand? How likely is an earthquake of that magnitude for the SONGS site?

Public Response: The design basis earthquake (DBE) is defined as that earthquake producing the maximum vibratory ground motion that the nuclear power generating station is designed to withstand without functional impairment of those features necessary to shut down the reactor, maintain the station in a safe condition, and prevent undue risk to the health and safety of the public. The DBE for SONGS was assessed during the construction permit phase of the project. The DBE is postulated to occur near the site (5 miles), and the ground accelerations are postulated to be quite high (0.67g), when compared to other nuclear plant sites in the U.S (0.25g or less is typical for plants in the eastern U.S.). Based on the unique seismic characteristics of the SONGS site, the site tends to amplify long-period motions, and to attenuate short-period motions. These site-specific characteristics were accounted for in the SONGS site-specific seismic analyses.

Additional, technical, non-public information: None

80) Could SONGS withstand an earthquake of the magnitude of the Japanese earthquake?

Public Response: We do not have current information on the ground motion at the Japanese reactors. SONGS was designed for approximately a 7.0 magnitude earthquake 4 miles away. The Japanese earthquake was much larger (8.9), but was also almost 9 miles away. The local ground motion at a particular plant is significantly affected by the local soil and bedrock conditions. SONGS was designed (,67g) to withstand more than 2 times the design motion at average US plants.

Additional, technical, non-public information: None

81) What about the evacuation routes at SONGS? How do we know they are reasonable?

Public Response: FEMA reviews off-site evacuation plans formally every 2 years during a biennial emergency preparedness exercise. NRC evaluates on-site evacuation plans during the same exercise. Population studies are formally done every 10 years, and evacuation time estimates are re-evaluated at that time. FEMA reviews these evacuation plans, and will conclude their acceptability through a finding of "reasonable assurance" that the off-site facilities and infrastructure is capable of protecting public health and safety in the event of an emergency at SONGS. The next such exercise is planned for April 12, 2011.

Additional, technical, non-public information: None

82) Regarding tsunami at Diablo and SONGS, is the tsunami considered separately from flooding in licensing? And from the design perspective, is the flood still the controlling event for those plants rather than the tsunami?

Public response: See below

83) What is the design level flooding for DNCPP and SONGS? Can a tsunami be larger?

Public response: Both the Diablo Canyon (main plant) and SONGS are located above the flood level associated with tsunami. However, the intake structures and Auxiliary Sea Water System at Diablo canyon are designed for combination of tsunami-storm wave activity. SONGS has reinforced concrete cantilevered retaining seawall and screen well perimeter wall designed to withstand the design basis earthquake, followed by the maximum predicted tsunami with coincident storm wave action

Additional, technical, non-public information: None

Diablo Canyon Questions

84) Now after the Japan tragedy, will the NRC finally hear us (A4NR) and postpone DC license renewal until seismic studies are complete? How can you be sure that what happened there is not going to happen at Diablo with a worse cast quake and tsunami?

Public response: ADD

Additional, technical, non-public information: ADD

85) The evacuation routes at DCNPP see are not realistic. Highway 101 is small...and can you imagine what it will be like with 40K people on it? Has the evacuation plan been updated w/ all the population growth?

Public Response: FEMA reviews off-site evacuation plans formally every 2 years during a biennial emergency preparedness exercise. NRC evaluates on-site evacuation plans during the same exercise. Population studies are formally done every 10 years, and evacuation time estimates are re-evaluated at that time. FEMA reviews these evacuation plans, and will conclude their acceptability through a finding of "reasonable assurance" that the off-site facilities and infrastructure is capable of protecting public health and safety in the event of an emergency at DCNPP.

Additional, technical, non-public information: None

86) Are there local offshore fault sources capable of producing a tsunami with very short warning times?

Public Response: ADD- question forwarded to region

Additional, technical, non-public information: ADD

87) Are there other seismically induced failure modes (other than tsunami) that would yield LTSBO? Flooding due to dam failure or widespread liquefaction are examples.

Public Response: ADD question forwarded to region

Additional, technical, non-public information: ADD

88) Ramifications of beyond design basis events (seismic and tsunami) and potential LTSBO on spent fuel storage facilities?

Public Response: ADD question forwarded to region

Additional, technical, non-public information: ADD

89) Why did a Emergency Warning go out for a 'tsunami' that was only 6 ft high? Do these guys really know what they're doing? Would they know it if a big one was really coming? Crying wolf all the time doesn't instill a lot of confidence.

Public Response: The warning system performed well. The 6 foot wave was predicted many hours before and arrived at the time it was predicted. Federal officials to accurately predicted the tsunami arrival time and size; allowing local official to take appropriate measures as they saw necessary to warn and protect the public. It should be understood that even a 6 foot tsunami is very dangerous. Tsunami have far more energy and power than wind-driven waves.

Additional, technical, non-public information: ADD

90) How big did the Japanese think a quake/tsunami could be before 3/11? Why were they so wrong (assuming this quake/tsunami was bigger than what they had designed the plant for)?

Public Response: ADD can HQ answer?

Additional, technical, non-public information: ADD

The Japanese were supposed to have one of the best tsunami warning systems around. What went wrong last week (both with the reactors and getting the people out...see #1, evacuation plan above)?

Public Response: ADD can HQ answer?

Additional, technical, non-public information: ADD

91) Regarding tsunami at Diablo and SONGS, is the tsunami considered separately from flooding in licensing? And from the design perspective, is the flood still the controlling event for those plants rather than the tsunami?

Public Response: Both the Diablo Canyon (main plant) and SONGS are located above the flood level associated with tsunami. However, the intake structures and Auxiliary Sea Water System at Diablo canyon are designed for combination of tsunami-storm wave activity. SONGS has reinforced concrete cantilevered retaining seawall and screen well perimeter wall designed to withstand the design basis earthquake, followed by the maximum predicted tsunami with coincident storm wave action

Additional, technical, non-public information: ADD

Indian Point Questions

92) Why is Indian Point safe if there is a fault line underneath it?

Public Response: The Ramapo fault system, which passes through the Indian Point area, is a group of Mesozoic age faults, extending from southeastern New York to northern New Jersey, as well as further southwest. The fault system is composed of a series of southeast-dipping, northeast-striking faults. Various faults of the system contain evidence of repeated slip in various directions since Proterozoic time, including Mesozoic extensional reactivation. However, the USGS staff, who reviewed 31 geologic features in the Appalachian Mountains and Coastal Plain and compiled a National Database on Quaternary Faulting (Crone and Wheeler, 2000), listed the Ramapo fault system as low risk because the fault system lacks evidence for Quaternary slip. They further pointed out that the Ramapo fault system, and 17 other geologic features, "have little or no published geologic evidence of Quaternary tectonic faulting that could indicate the likely occurrence of earthquakes larger than those observed historically" (Wheeler and Crone, 2004). Among these faults, the Ramapo fault system is one of the three that underwent a paleoseismological study. In two trenches excavated across the Ramapo fault, no evidence of Quaternary tectonic faulting was found (Wheeler and Crone, 2000). Because the Ramapo fault system is relatively inactive, because the Indian Point plants are built on solid bedrock, and because the plants are designed to safely shutdown in the event of an earthquake of the highest intensity ever recorded in that area, the NRC has concluded that the risk of significant damage to the reactors due to a probable earthquake in the area is extremely small.

Additional, technical, non-public information: None.

Questions for the Japanese

NOTE: These were all collected from what we produced after the KKNPP earthquake. These need to be gone through and revised for this event. We should separate into high, medium and low priorities:

The below is pulled from an KKNPP summary...to be reviewed...

What seismic monitoring equipment exists at the plants? Can we get the recordings from the
Are there recordings of the tsunami at the plant location?
What is the geology and soil profile at the plants?
NOAA has a prediction of very large tsunami waves at Onagawa. Are these accurate?

The below is pulled from an KKNPP summary...to be reviewed...

DESIGN BASES: Exactly what is the design basis ground motion for each of the plants? Did it change through time (i.e. from the first plant to the seventh)? Where was the design basis motion defined, at the top of rock, at the ground surface, at the floor level or somewhere else? Were the site-specific geotechnical properties used in the development of the design basis ground motions for each plant?

SEISMIC HAZARDS: What assumptions were used in the seismic hazard evaluation to arrive at the design basis ground motions? What faults were considered, what magnitudes and geometries were assumed? What activity rates were assumed for both fault sources and "background" earthquakes?

OBSERVATIONS-GROUND MOTIONS: What ground motions were recorded and where were they recorded? Specifically, what free-field, in-structure and down-hole recordings were obtained? What are the locations of the instruments that obtained records? Did all the instruments respond as planned, or are there lessons to be learned? Can the digital data be shared with the NRC? Is there any way of evaluating how well the existing analysis methods predicted the observed motions at different points within the plant?

OBSERVATIONS-DAMAGE: What damage was observed at the plants? How well did equipment such as cranes perform? Were there observations of displacements of equipment from anchorages, were cracks observed in any of the buildings? How well did non-nuclear safety type of buildings and equipment perform? What types of geotechnical phenomena were observed, was there ground deformation/slope failures, lateral spreading or liquefaction near the facility? Did the ABWRs perform better or similar to the older designs?

And another set from the KKNPP earthquake...to be reviewed...

Please provide the following information in the time frame indicated:

Highest Priority Questions – as soon as possible

- A timeline describing the order of events and the individual plant responses to the earthquake
- Confirmation that all operating and shut down units achieved or maintained safe-shutdown conditions without manual operator intervention or complications. Did all safety-related systems respond to the seismic scram as designed? Please note if there were any unexpected plant responses to the event, including any spurious signals.
- A more detailed description of the impacts of the earthquake on the plant (e.g., what systems were involved, which pipes were damaged, where did the leakage occur (pipe wall, joints, fittings,,etc).
- A description of seismic instrumentation at the site and at each of the 7 units, soil/rock shear wave properties through depth, instrument location and mounting condition, all the recorded

data on the basis of unified starting time, such that the coherency of motion through the surface or the foundations and at depth can be determined
- Full spectrum seismic design basis for the plant.
- What actually caused the Unit 3B house transformer fire?

Additional Questions – please provide answers as more information is developed

- Damage to buildings, slope failures, intake structure failure, if any
- Behavior of cranes, cables and conduits
- Failures of any large pumps and valves, pipe mounted control or valve failure
- Instances of any relay or vibration sensitive components malfunctioning
- Nature of damage to service water and fire-suppression piping - their diameter, material they are made of including their elastic properties, design standards used for the piping design, nature of failure (at support, anchor motion, failure of anchors, subsidence differential movement etc)
- Were there any systems that changed state?
- Impact on physical security, and any vulnerabilities identified
- Were there any impacts on the grid because of the event?
- Please describe the switchyard performance?
- What emergency preparedness concerns have been identified as a result of the event?

3B Transformer Specific Questions – please respond when there is time and other issues have been addressed

- What are the primary and secondary voltages of the transformer?
- What type of transformer - liquid or dry-type (air-cooled)?
- Who was the manufacturer of the transformer?
- What are the physical dimensions of the transformer?
- How are the transformer coils restrained within the cabinet?
- What is the clearance between transformer energized component and cabinet?
- What is the relative displacement for connection between the high voltage leads and the first anchor point (adequate slack?) in the transformer?
- What was the natural frequency of the burned transformer, if known?
- What was the acceleration level (or the response spectrum, if available) at the support location of the burned transformer?
- What seismic requirements exist for the burned transformer? Was the transformer tested or analyzed to a specific acceleration or response spectra, and if so, what are they?
- Are there any of the same type of transformer installed at other locations in the plant?

Additional Information

Table of Design Basis Ground Motions for US Plants

Design Basis Earthquake Information					
Nuclear Plant By State/Location	**Maximum Observed Or Inferred Intensity (MMI Scale)**	**Relative Distance Of Seismic Source**	**Design SSE Peak Acceleration, *g***	**OBE Peak Acceleration, *g***	**Soil Condition**
New York					
Fitzpatrick	VI	Near	0.15	0.08	Soil
Ginna 1	VIII/IX	>60 miles	0.2	0.08	Rock
Indian Point 2, 3	VII	Near	0.15	0.1	Rock
Nine Mile Point 1	IX-X	>60 miles	0.11	0.06	Rock
Nine Mile Point 2	VI	Near	0.15	0.075	Rock
New Jersey					
Salem 1,2	VII-VIII	Near	0.2	0.1	Deep Soil
Connecticut					
Millstone 1, 2, 3	VII	Near	0.17	0.07	Rock
Vermont					
Vermont Yankee	VI	Near	0.14	0.07	Rock
Ohio					
Davis Besse 1	VII	Near	0.15	0.08	Rock
Perry 1	VII	Near	0.15	0.08	Rock
Georgia					
Hatch 1, 2	VII	Near	0.15	0.08	Deep Soil
Vogtle 1, 2	VII-VIII	Near	0.2	0.12	Deep Soil
Tennessee					
Seqouyah 1, 2	VIII	Near	0.18	0.09	Rock
Watts Bar 1	VIII	Near	0.18	0.09	Rock
California					
San Onofre 2, 3	IX-X	Near	0.67	0.34	Soil
Diablo Canyon 1, 2	X-XI	Near	0.75	0.20	Rock
Florida					

Crystal River 3	V	Near	0.10	0.05	Rock
St. Lucie 1, 2	VI	Near	0.10	0.05	Soil
Turkey Point 3, 4	VII	Near	0.15	0.05	Rock

NOTES:

MMI=Modified Mercalli Intensity, a measure of observed/reported damage and severity of shaking.
Relative distance measure used in FSAR to develop SSE acceleration, "Near" indicates distance less than 10 miles.
SSE=Safe Shutdown Earthquake ground motion, for horizontal acceleration, in units of earth's gravity, *g*.
OBE=Operating Basis Earthquake ground motion, level of horizontal acceleration, which if exceeded requires plant shutdown.

Table of SSE, OBE and Tsunami Water Levels

Nuclear Plant Name By State/ Location	Safe Shutdown Earthquake (SSE) Peak Acceleration (g)	Operating Basis Earthquake (OBE) Peak Acceleration, (g)	Probable Maximum Tsunami OR Maximum Tsunami Water Level
Alabama			
Browns Ferry	0.200	0.100	N/A (Non-Coastal)
Farley	0.100	0.050	N/A (Non-Coastal)
Arkansas			
Arkansas Nuclear	0.200		N/A (Non-Coastal)
Arizona			
Palo Verde	0.200	0.100	N/A (Non-Coastal)
California			
Diablo Canyon	0.400	0.200	The design basis maximum combined wave runup is the greater of that determined for near-shore or distantly-generated tsunamis, and results from near-shore tsunamis. For distantly-generated tsunamis, the combined runup is 30 feet For near-shore tsunamis, the combined wave runup is 34.6 feet, as determined by hydraulic model testing. The safety-related equipment is installed in watertight compartments to protect it from adverse sea wave events to elevation +48 feet above MLLW.
San Onofre	0.670	0.340	The controlling tsunami occurs during simultaneous high tide and storm surge produces a maximum runup to elevation +15.6 feet mean lower low water line (mllw) at the Unit 2 and 3 seawall. When storm waves are superimposed, the predicted maximum runup is to elevation +27 mllw. Tsunami protection for the SONGS site is provided by a reinforced concrete seawall constructed to elevation +30.0 mllw.
Connecticut			
Millstone	0.170	0.090	18 ft SWL
Florida			
Crystal River	0.050	0.025	N/A (Non-Coastal)

Nuclear Plant Name By State/ Location	Safe Shutdown Earthquake (SSE) Peak Acceleration (g)	Operating Basis Earthquake (OBE) Peak Acceleration, (g)	Probable Maximum Tsunami OR Maximum Tsunami Water Level
St. Lucie	0.100	0.050	No maximum tsunami level, bounded by PMH surge of +18 MLW wave runup, with plant openings at +19.5 MLW
Turkey Point	0.150	0.050	No maximum tsunami level, bounded by PMH surge of +18.3 MLW water level, site protected to +20 MLW with vital equipment protected to +22 MLW
Georgia			
Hatch	0.150	0.080	N/A (Non-Coastal)
Vogtle	0.200	0.120	N/A (Non-Coastal)
Illinois			
Braidwood	0.200	0.090	N/A (Non-Coastal)
Byron	0.200	0.090	N/A (Non-Coastal)
Clinton	0.250	0.100	N/A (Non-Coastal)
Dresden	0.200	0.100	N/A (Non-Coastal)
LaSalle	0.200	0.100	N/A (Non-Coastal)
Quad Cities	0.240	0.120	N/A (Non-Coastal)
Iowa			
Duane Arnold	0.120	0.060	N/A (Non-Coastal)
Kansas			
Wolf Creek	0.120	0.060	N/A (Non-Coastal)
Louisiana			
River Bend	0.100	0.050	
Waterford	0.100		Floods – 30 feet MSL
Maryland			
Calvert Cliffs	0.150	0.080	14 ft design wave
Massachusetts			
Pilgrim	0.150	0.080	*Storm flooding design basis - 18.3ft
Michigan			
D.C. Cook	0.200	0.100	N/A
Fermi	0.150	0.080	N/A
Palisades	0.200	0.100	N/A

Nuclear Plant Name By State/ Location	Safe Shutdown Earthquake (SSE) Peak Acceleration (g)	Operating Basis Earthquake (OBE) Peak Acceleration, (g)	Probable Maximum Tsunami OR Maximum Tsunami Water Level
Missouri			
Callaway	0.200		N/A (Non-Coastal)
Mississippi			
Grand Gulf	0.150	0.075	N/A
Minnesota			
Monticello	0.120	0.060	N/A (Non-Coastal)
Prarie Island	0.120	0.060	N/A (Non-Coastal)
Nebraska			
Cooper	0.200	0.100	N/A (Non-Coastal)
Fort Calhoun	0.170	0.080	N/A (Non-Coastal)
New York			
Fitzpatrick	0.150	0.080	N/A (Non-Coastal)
Ginna	0.200	0.080	N/A
Indian Point	0.150	0.100	15 ft msl
Nine Mile Point, Unit 1	0.110	0.060	N/A
Nine Mile Point, Unit 2	0.150	0.075	N/A
New Hampshire			
Seabrook	0.250	0.125	(+) 15.6' MSL Still Water Level (Tsunami Flooding -Such activity is extremely rare on the U.S. Atlantic coast and would result in only minor wave action inside the harbor.)
New Jersey			
Hope Creek	0.200	0.100	35.4 MSL The maximum probable tsunami produces relatively minor water level changes at the site. The maximum runup height reaches an elevation of 18.1 feet MSL with coincident 10 percent exceedance high tide)
Oyster Creek	0.184	0.092	(+) 23.5' MSL Still Water Level (Probable Maximum Tsunami - Tsunami events are not typical of the eastern coast of the United States and have not, therefore, been addressed.)

Nuclear Plant Name By State/ Location	Safe Shutdown Earthquake (SSE) Peak Acceleration (g)	Operating Basis Earthquake (OBE) Peak Acceleration, (g)	Probable Maximum Tsunami OR Maximum Tsunami Water Level
Salem	0.200	0.100	21.9 MSL (There is no evidence of surface rupture in East Coast earthquakes and no history of significant tsunami activity in the region)
North Carolina			
Brunswick	0.160	0.030	N/A
McGuire	0.150	0.080	N/A (Non-Coastal)
Shearon Harris	0.150		N/A (Non-Coastal)
Ohio			
Davis-Besse	0.150	0.080	N/A
Perry	0.150	0.080	N/A
Pennsylvania			
Beaver Valley	0.130	0.060	N/A (Non-Coastal)
Limerick	0.150	0.075	N/A (Non-Coastal)
Peach Bottom	0.120	0.050	N/A (Non-Coastal)
Three Mile Island	0.120	0.060	N/A (Non-Coastal)
Susquehanna	0.150	0.080	N/A (Non-Coastal)
South Carolina			
Catawba	0.150	0.080	N/A (Non-Coastal)
Oconee	0.150	0.050	N/A (Non-Coastal)
Robinson	0.200	0.100	N/A (Non-Coastal)
V.C. Summer	0.250	0.150	N/A (Non-Coastal)
Tennessee			
Sequoyah	0.180	0.090	N/A (Non-Coastal)
Watts Bar, Unit 1	0.180	0.090	N/A (Non-Coastal)
Texas			
Comanche Peak	0.120	0.060	N/A
South Texas Project	0.100	0.050	N/A
Vermont			

Nuclear Plant Name By State/ Location	Safe Shutdown Earthquake (SSE) Peak Acceleration (g)	Operating Basis Earthquake (OBE) Peak Acceleration, (g)	Probable Maximum Tsunami OR Maximum Tsunami Water Level
Vermont Yankee	0.140	0.070	N/A
Virginia			
North Anna	0.180		N/A
Surry	0.150	0.080	N/A
Washington			
Columbia	0.250		N/A (Non-Coastal)
Wisconsin			
Kawaunee	0.120	0.060	N/A
Point Beach	0.120		N/A
Definition of Safe Shutdown Earthquake	The safe-shutdown earthquake (SSE) for the site is the ground motion response spectra (GMRS), which also satisfies the minimum requirement of paragraph IV(a)(1)(i) of Appendix S, "Earthquake Engineering Criteria for Nuclear Power Plants," to Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," of the Code of Federal Regulations (10 CFR Part 50).		
Definition of Operating Basis Earthquake:	To satisfy the requirements of paragraph IV(a)(2)(A) of Appendix S to 10 CFR Part 50, the operating-basis earthquake (OBE) ground motion is defined as follows: (iv) For the certified design portion of the plant, the OBE ground motion is one-third of the CSDRS. (v) For the safety-related noncertified design portion of the plant, the OBE ground motion is one-third of the design motion response spectra, as stipulated in the design certification conditions specified in design control document (DCD). (vi) The spectrum ordinate criterion to be used in conjunction with Regulatory Guide 1.166, "Pre-Earthquake Planning and Immediate Nuclear Power Plant Operator Post-earthquake Actions," issued March 1997, is the lowest of (i) and (ii).		

Table From GI-199 Program Containing SSE, SSE Exceedance Frequencies, Review Level Earthquakes, and Seismic Core Damage Frequencies

Plant	Docket	SSE (g's)	Frequency of Exceeding the SSE (per year)	RLE (HCLPF) (g's)	Seismic Core Damage Frequency (per year)	IPEEE Method	Source
Arkansas 1	05000313	0.2	2.8E-04	0.3	4.1E-06	0.3g full-scope EPRI SMA	GI-199
Arkansas 2	05000368	0.2	9.7E-05	0.3	4.1E-06	0.3g focused-scope EPRI SMA	GI-199
Beaver Valley 1	05000334	0.12	3.3E-04	n/a	4.8E-05	seismic PRA	GI-199
Beaver Valley 2	05000412	0.12	2.7E-04	n/a	2.2E-05	seismic PRA	GI-199
Braidwood 1	05000456	0.2	6.7E-05	0.3	7.3E-06	0.3g focused-scope EPRI SMA	GI-199
Braidwood 2	05000457	0.2	6.7E-05	0.3	7.3E-06	0.3g focused-scope EPRI SMA	GI-199
Browns Ferry 1	05000259	0.2	2.5E-04	0.3	3.7E-06	0.3g focused-scope EPRI SMA	GI-199
Browns Ferry 2	05000260	0.2	2.5E-04	0.26	5.4E-06	0.3g focused-scope EPRI SMA	GI-199
Browns Ferry 3	05000296	0.2	2.5E-04	0.26	5.4E-06	0.3g focused-scope EPRI SMA	GI-199
Brunswick 1	05000325	0.16	7.3E-04	0.3	1.5E-05	0.3g focused-scope EPRI SMA	GI-199
Brunswick 2	05000324	0.16	7.3E-04	0.3	1.5E-05	0.3g focused-scope EPRI SMA	GI-199
Byron 1	05000454	0.2	5.2E-05	0.3	5.8E-06	0.3g focused-scope EPRI SMA	GI-199
Byron 2	05000455	0.2	5.2E-05	0.3	5.8E-06	0.3g focused-scope EPRI SMA	GI-199
Callaway	05000483	0.2	3.8E-05	0.3	2.0E-06	0.3g focused-scope EPRI SMA	GI-199
Calvert Cliffs 1	05000317	0.15	1.9E-04	n/a	1.0E-05	seismic PRA	GI-199
Calvert Cliffs 2	05000318	0.15	1.9E-04	n/a	1.2E-05	seismic PRA	GI-199
Catawba 1	05000413	0.15	1.4E-04	n/a	3.7E-05	seismic PRA	GI-199
Catawba 2	05000414	0.15	1.4E-04	n/a	3.7E-05	seismic PRA	GI-199
Clinton	05000461	0.25	5.8E-05	0.3	2.5E-06	0.3g focused-scope EPRI SMA	GI-199
Columbia	05000397	0.25	1.7E-04	n/a	2.1E-05	seismic PRA	IPEEE
Comanche Peak 1	05000445	0.12	1.6E-05	0.12	4.0E-06	reduced-scope EPRI SMA; SSE = 0.12g	GI-199
Comanche	05000446	0.12	1.6E-05	0.12	4.0E-06	reduced-scope EPRI SMA; SSE =	GI-199

Plant	Docket	SSE (g's)	Frequency of Exceeding the SSE (per year)	RLE (HCLPF) (g's)	Seismic Core Damage Frequency (per year)	IPEEE Method	Source
Peak 2						0.12g	
Cooper	05000298	0.2	1.5E-04	0.3	7.0E-06	0.3g focused-scope EPRI SMA	GI-199
Crystal River 3	05000302	0.1	8.9E-05	0.1	2.2E-05	reduced-scope EPRI SMA; SSE = 0.1g	GI-199
D.C. Cook 1	05000315	0.2	2.1E-04	n/a	2.2E-05	seismic PRA	GI-199
D.C. Cook 2	05000316	0.2	2.1E-04	n/a	2.2E-05	seismic PRA	GI-199
Davis Besse	05000346	0.15	6.3E-05	0.26	6.7E-06	reduced-scope EPRI SMA	GI-199
Diablo Canyon 1	05000275	0.75	3.9E-03	n/a	4.2E-05	seismic PRA	IPEEE
Diablo Canyon 2	05000323	0.75	3.9E-03	n/a	4.2E-05	seismic PRA	IPEEE
Dresden 2	05000237	0.2	9.7E-05	0.26	1.9E-05	0.3g focused-scope EPRI SMA	GI-199
Dresden 3	05000249	0.2	9.7E-05	0.26	1.9E-05	0.3g focused-scope EPRI SMA	GI-199
Duane Arnold	05000331	0.12	2.3E-04	0.12	3.2E-05	reduced-scope EPRI SMA; SSE = 0.12g	GI-199
Farley 1	05000348	0.1	1.0E-04	0.1	2.8E-05	reduced-scope EPRI SMA; SSE = 0.1g	GI-199
Farley 2	05000364	0.1	1.0E-04	0.1	2.8E-05	reduced-scope EPRI SMA; SSE = 0.1g	GI-199
Fermi 2	05000341	0.15	1.0E-04	0.3	4.2E-06	0.3g focused-scope EPRI SMA	GI-199
Fitzpatrick	05000333	0.15	3.2E-04	0.22	6.1E-06	0.3g focused-scope NRC SMA	GI-199
Fort Calhoun 1	05000285	0.17	3.7E-04	0.25	5.4E-06	0.3g focused-scope NRC SMA	GI-199
Ginna	05000244	0.2	1.0E-04	0.2	1.3E-05	0.3g focused-scope EPRI SMA	GI-199
Grand Gulf	05000416	0.15	1.0E-04	0.15	1.2E-05	reduced-scope EPRI SMA; SSE = 0.15g	GI-199
Hatch 1	05000400	0.148	3.9E-04	0.29	2.3E-06	0.3g focused-scope EPRI SMA	GI-199
Hatch 2	05000321	0.15	2.7E-04	0.3	2.5E-06	0.3g focused-scope EPRI SMA	GI-199

Plant	Docket	SSE (g's)	Frequency of Exceeding the SSE (per year)	RLE (HCLPF) (g's)	Seismic Core Damage Frequency (per year)	IPEEE Method	Source
Hope Creek	05000366	0.2	9.7E-05	0.3	2.5E-06	0.3g focused-scope EPRI SMA	GI-199
Indian Point 2	05000354	0.15	4.9E-04	n/a	2.8E-06	seismic PRA	GI-199
Indian Point 3	05000247	0.15	4.9E-04	n/a	3.3E-05	seismic PRA	GI-199
Kewaunee	05000286	0.12	2.8E-04	n/a	1.0E-04	seismic PRA	GI-199
LaSalle 1	05000305	0.2	1.7E-04	n/a	5.1E-06	seismic PRA	GI-199
LaSalle 2	05000373	0.2	1.7E-04	n/a	2.8E-06	seismic PRA	GI-199
Limerick 1	05000374	0.15	1.8E-04	n/a	2.8E-06	seismic PRA	GI-199
Limerick 2	05000352	0.15	1.8E-04	0.15	5.3E-05	reduced-scope EPRI SMA	GI-199
McGuire 1	05000353	0.15	9.5E-05	0.15	5.3E-05	reduced-scope EPRI SMA	GI-199
McGuire 2	05000369	0.15	9.5E-05	n/a	3.1E-05	seismic PRA	GI-199
Millstone 1	05000370	0.254	9.3E-05	n/a	3.1E-05	seismic PRA	GI-199
Millstone 2	05000336	0.17	8.3E-05	0.25	1.1E-05	0.3g focused-scope EPRI SMA	GI-199
Millstone 3	05000423	0.17	8.3E-05	n/a	1.5E-05	seismic PRA	GI-199
Monticello	05000263	0.12	9.3E-05	0.12	1.9E-05	modified focused/expended reduced-scope EPRI SMA	GI-199
Nine Mile Point 1	05000220	0.11	1.5E-04	0.27	4.2E-06	0.3g focused-scope EPRI SMA	GI-199
Nine Mile Point 2	05000410	0.15	4.8E-05	0.23	5.6E-06	SPRA and focused-scope EPRI SMA	GI-199
North Anna 1	05000338	0.12	2.1E-04	0.16	4.4E-05	0.3g focused-scope EPRI SMA	GI-199
North Anna 2	05000339	0.12	2.1E-04	0.16	4.4E-05	0.3g focused-scope EPRI SMA	GI-199
Oconee 1	05000269	0.1	9.7E-04	n/a	4.3E-05	seismic PRA	GI-199
Oconee 2	05000270	0.1	9.7E-04	n/a	4.3E-05	seismic PRA	GI-199
Oconee 3	05000287	0.1	9.7E-04	n/a	4.3E-05	seismic PRA	GI-199
Oyster Creek	05000219	0.17	1.5E-04	n/a	1.4E-05	seismic PRA	GI-199
Palisades	05000255	0.2	1.4E-04	n/a	6.4E-06	seismic PRA	GI-199
Palo Verde 1	05000528	0.258	3.5E-05	0.3	3.8E-05	0.3g full-scope EPRI SMA	IPEEE
Palo Verde 2	05000529	0.258	3.5E-05	0.3	3.8E-05	0.3g full-scope EPRI SMA	IPEEE

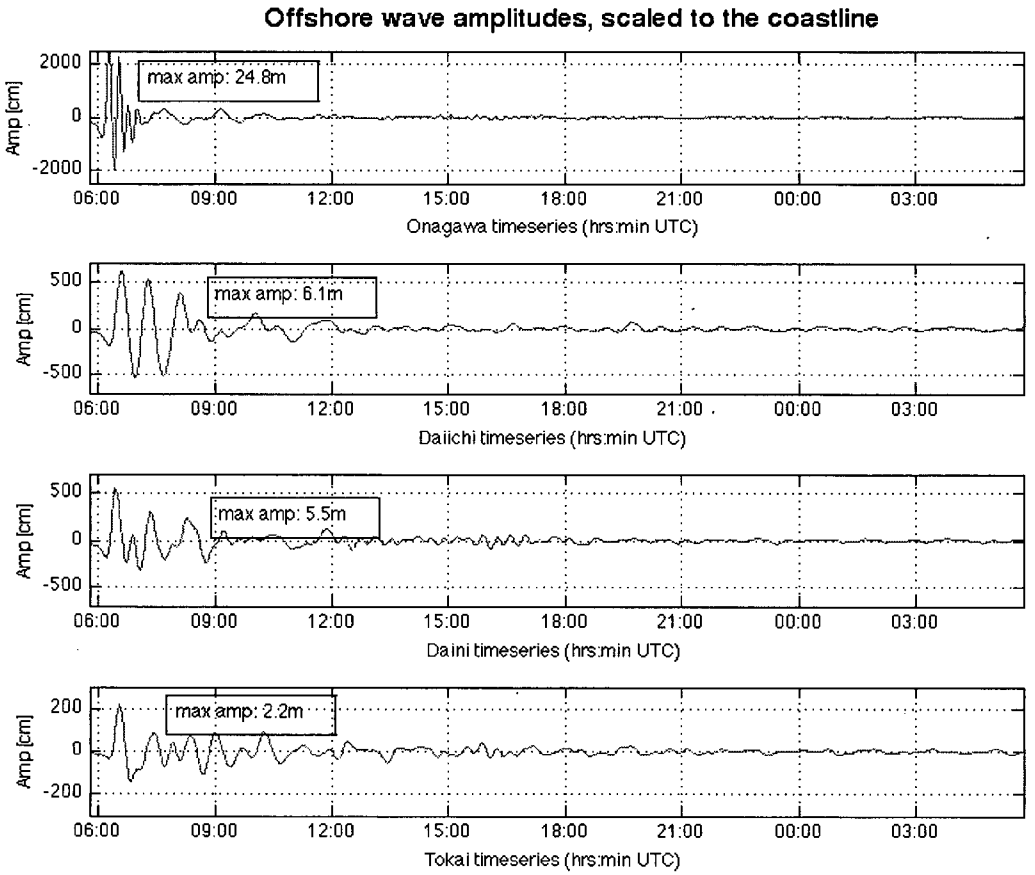
Plant	Docket	SSE (g's)	Frequency of Exceeding the SSE (per year)	RLE (HCLPF) (g's)	Seismic Core Damage Frequency (per year)	IPEEE Method	Source
Palo Verde 3	05000530	0.258	3.5E-05	0.3	3.8E-05	0.3g full-scope EPRI SMA	IPEEE
Peach Bottom 2	05000277	0.12	2.0E-04	0.2	2.4E-05	modified focused-scope EPRI SMA	GI-199
Peach Bottom 3	05000278	0.12	2.0E-04	0.2	2.4E-05	modified focused-scope EPRI SMA	GI-199
Perry	05000440	0.15	2.2E-04	0.3	2.1E-05	0.3g focused-scope EPRI SMA	GI-199
Pilgrim 1	05000293	0.15	8.1E-04	n/a	6.9E-05	seismic PRA	GI-199
Point Beach 1	05000266	0.12	2.0E-04	n/a	1.1E-05	seismic PRA	GI-199
Point Beach 2	05000301	0.12	2.0E-04	n/a	1.1E-05	seismic PRA	GI-199
Prairie Island 1	05000282	0.12	2.0E-04	0.28	3.0E-06	0.3g focused-scope EPRI SMA	GI-199
Prairie Island 2	05000306	0.12	2.0E-04	0.28	3.0E-06	0.3g focused-scope EPRI SMA	GI-199
Quad Cities 1	05000254	0.24	8.2E-04	0.09	2.7E-05	0.3g focused-scope EPRI SMA	GI-199
Quad Cities 2	05000265	0.24	8.2E-04	0.09	2.7E-05	0.3g focused-scope EPRI SMA	GI-199
River Bend	05000458	0.1	2.4E-04	0.1	2.5E-05	reduced-scope EPRI SMA; SSE = 0.1g	GI-199
Robinson (HR)	05000261	0.2	1.1E-03	0.28	1.5E-05	0.3g full-scope EPRI SMA	GI-199
Saint Lucie	05000335	0.1	1.4E-04	0.1	4.6E-05	reduced-scope EPRI SMA; SSE = 0.1g	GI-199
Salem 1	05000389	0.2	2.6E-04	0.1	4.6E-05	reduced-scope EPRI SMA; SSE = 0.1g	GI-199
Salem 2	05000272	0.2	2.6E-04	n/a	9.3E-06	seismic PRA	GI-199
San Onofre 2	05000361	0.67	1.2E-04	n/a	1.7E-05	seismic PRA	IPEEE
San Onofre 3	05000362	0.67	1.2E-04	n/a	1.7E-05	seismic PRA	IPEEE
Seabrook	05000311	0.25	1.3E-04	n/a	9.3E-06	seismic PRA	GI-199
Sequoyah 1	05000443	0.18	7.1E-04	n/a	2.2E-05	seismic PRA	GI-199
Sequoyah 2	05000327	0.18	7.1E-04	0.27	5.1E-05	0.3g full-scope EPRI SMA	GI-199
Shearon Harris 1	05000328	0.15	4.6E-05	0.27	5.1E-05	0.3g full-scope EPRI SMA	GI-199
South Texas 1	05000498	0.1	3.0E-05	n/a	6.2E-06	seismic PRA	GI-199

Plant	Docket	SSE (g's)	Frequency of Exceeding the SSE (per year)	RLE (HCLPF) (g's)	Seismic Core Damage Frequency (per year)	IPEEE Method	Source
South Texas 2	05000499	0.1	3.0E-05	n/a	6.2E-06	seismic PRA	GI-199
Summer	05000395	0.15	3.9E-04	0.22	3.8E-05	0.3g focused-scope EPRI SMA	GI-199
Surry 1	05000280	0.15	2.2E-04	n/a	5.7E-06	seismic PRA	GI-199
Surry 2	05000281	0.15	2.2E-04	n/a	5.7E-06	seismic PRA	GI-199
Susquehanna 1	05000387	0.1	1.9E-04	0.21	1.3E-05	0.3g focused-scope EPRI SMA	GI-199
Susquehanna 2	05000388	0.1	1.9E-04	0.21	1.3E-05	0.3g focused-scope EPRI SMA	GI-199
Three Mile Island 1	05000289	0.12	1.0E-04	n/a	4.0E-05	seismic PRA	GI-199
Turkey Point 3	05000250	0.15	3.8E-05	0.15	1.0E-05	site-specific approach; SSE=0.15g	GI-199
Turkey Point 4	05000251	0.15	3.8E-05	0.15	1.0E-05	site-specific approach; SSE=0.15g	GI-199
Vermont Yankee	05000271	0.14	1.2E-04	0.25	8.1E-06	0.3g focused-scope EPRI SMA	GI-199
Vogtle 1	05000424	0.2	1.5E-04	0.3	1.8E-05	0.3g focused-scope EPRI SMA	GI-199
Vogtle 2	05000425	0.2	1.5E-04	0.3	1.8E-05	0.3g focused-scope EPRI SMA	GI-199
Waterford 3	05000382	0.1	1.1E-04	0.1	2.0E-05	reduced-scope EPRI SMA; SSE = 0.1g	GI-199
Watts Bar	05000390	0.18	2.9E-04	0.3	3.6E-05	0.3g focused-scope EPRI SMA	GI-199
Wolf Creek	05000482	0.12	3.7E-05	0.2	1.8E-05	reduced-scope EPRI SMA	GI-199
		25th percentile	9.6E-05		6.0E-06		
		min	1.6E-05		2.0E-06		
		median	1.7E-04		1.5E-05		
		mean	3.1E-04		2.1E-05		
		max	3.9E-03		1.0E-04		
		75th percentile	2.6E-04		3.2E-05		

Summary of seismological information from regional instrumentation

Placeholder: Jon Ake is developing.

Tsunami wave heights from NOAA (very preliminary. For basic situational awareness only)



Tsunami Fact Sheet

Placeholder: Goutam Bagchi, Henry Jones and Rich Raone are developing.

Seismicity of the Central and Eastern US Fact Sheet

Placeholder: Jon Ake is developing.

Design Basis Ground Motions and New Review Level Ground Motions Used for Review of Japanese Plants

Plant sites	Contributing earthquakes	New DBGM S_s	Original DBGM S_2
Tomari	Earthquakes undefined specifically	550 Gal	370 Gal
Onagawa	Soutei Miyagiken-oki (M8.2)	580	375
Higashidoori	Earthquakes undefined specifically	450	375
Fukushima	Earthquake near the site (M7.1)	600	370
Tokai	Earthquakes undefined specifically	600	380
Hamaoka	Assumed Tokai (M8.0), etc.	800	600
Shika	Sasanami-oki Fault (M7.6)	600	490
Tsuruga	Urazoko-Uchiikemi Fault (M6.9), etc. →Mera-Kareizaki - Kaburagi(M7.8), Shelf edge+B+Nosaka (M7.7)	800	532
Mihama	C, Fo-A Fault (M6.9)→ Shelf edge+B+Nosaka(M7.7)	750	405
Ohi	C, Fo-A Fault (M6.9)→Fo-A+Fo-B （M7.4)	700	405
Takahama	Fo-A Fault (M6.9) →Fo-A+Fo-B(M7.4)	550	370
Shimane	Shinji Fault (M7.1)	600	456
Ikata	Central Tectonic Structure (M7.6)	570	473
Genkai	Takekoba F. （M6.9) → Enhanced uncertainty consideration	540	370
Sendai	Gotandagawa F.(M6.9), F-A(M6.9)	540	372
Kashiwazaki-Kariwa	F-B Fault (M7.0), Nagaoka-plain-west Fault (M8.1)	2300 (R1 side) 1209 (R5 side)	450
Monjyu （Proto Type FBR)	Shiraki-Niu F.(M6.9) , C F.(M6.9)→Shelf edge+B+Nosaka(M7.7), Small Damping	760	408
Shimokita Reprocessing F.	Deto-Seiho F.(M6.8), Yokohama F.(M6.8)	450	320

Status of Review of Japanese NPPs to New Earthquake Levels Based on 2006 Guidance

Utility	Site (Unit)	Type	Dec.2010
Hokkaido	Tomari	PWR	△
Tohoku	Onagawa (Unit1)	BWR	◎
	Higashi-dori	BWR	△
Tokyo	Kashiwazaki-Kariwa	BWR	Unit 1,5,6,7 ◎
	Fukushima-No1	BWR	Unit 3 ◇, 5 ◎
	Fukushima-No2	BWR	Unit 4,5 ◎
Chubu	Hamaoka	BWR	△
Hokuriku	Shika (Unit 2)	BWR	◎
Kansai	Mihama(Unit 1)	PWR	◎
	Ohi(Unit 3,4)	PWR	◎
	Takahama （Unit 3,4)	PWR	◎
Chugoku	Shimane (Unit 1, 2)	BWR	◎
Shikoku	Ikata (Unit 3)	PWR	◎
Kyushu	Genkai (Unit 3)	PWR	◎
	Sendai (Unit 1)	PWR	◎
Japan Atomic Power	Tokai-Daini	BWR	○
	Tsuruga	BWR/PWR	△
JAEA	Monjyu	Proto Type FBR	◎
Japan Nuc. Fuel	Rokkasyo	Reprocessing	◎

◎: NSC review finished, ○: NISA review finished and in NSC review, △: Under review by NISA

US Portable Array briefing sheet for brief congressional staffers

NOTE: This is provided because IRIS participants let us know that here was a discussion about the NRC's involvement in this program. We have been involved in this for the last couple years.

The IRIS CONSORTIUM

The Incorporated Research Institutions for Seismology is the Consortium of Unites States Universities with Major Research Programs in Seismology and Related Fields.

The Transportable Array: A Science Investment that Can Be Leveraged

IRIS is installing the Transportable Array – a set of 400 broadband seismic instruments – in each of more than 1600 sites across the contiguous United States. The instruments operate at each site for two years and then are removed and redeployed further east. Roughly 1100 stations have been installed since 2003, and instruments have been removed from more than 600 of those sites in the western United States.

The National Science Foundation is funding the full cost to "roll" the Transportable Array across the US, more than $90,000,000 over ten years. Comparatively small incremental investments could add significant data that are relevant to the safety of nuclear power plants. These efforts would be uniquely cost effective, since NSF is already funding installation, and they would feed data into an existing, standardized and widely used data management system that already incorporates the vast majority of seismic data from US networks. But these opportunities are time constrained: the array will be fully installed in the contiguous 48 states by late 2013.

More Value from Longer Term Regional Observations

A dense, uniform seismic network is necessary for long-term, broad-area seismic monitoring of the central and eastern United States due to low event recurrence rates and the risk of significant earthquakes (M>5) anywhere in the region. Monitoring seismicity in the central and eastern US can be improved by turning selected sites into permanent seismic stations. A total of more than 35 Transportable Array stations have already been "adopted" by several organizations, creating a permanent legacy, but only in the western United States.

A strategic "1-in-4" plan would involve "adoption" of systematically selected stations in the central and eastern United States – every other station in both the east-west and north-south directions, creating a uniform grid of some 250 stations. Long-term regional operation could be combined with two optional enhancements to create a unique observatory for the study of seismicity, source characteristics, attenuation, and local ground acceleration.

Enhancement 1: Acquire Higher Frequency Data

Crustal rigidity in the central and eastern US makes it desirable to record high frequency characteristics of local and regional earthquakes. The existing instruments could be reconfigured to record high frequencies but doing so would nearly triple the data flow, necessitating improvements to the communications infrastructure.

Enhancement 2: Add Strong Motion Sensors

Acquiring strong motion sensors and reconfiguring field computers that record and telemeter the data would help to measure unique effects of severe shaking. The design anticipated this augmentation, and several stations in California and Washington were operated that way. Upgrade would be more efficient at sites that have not yet been installed.

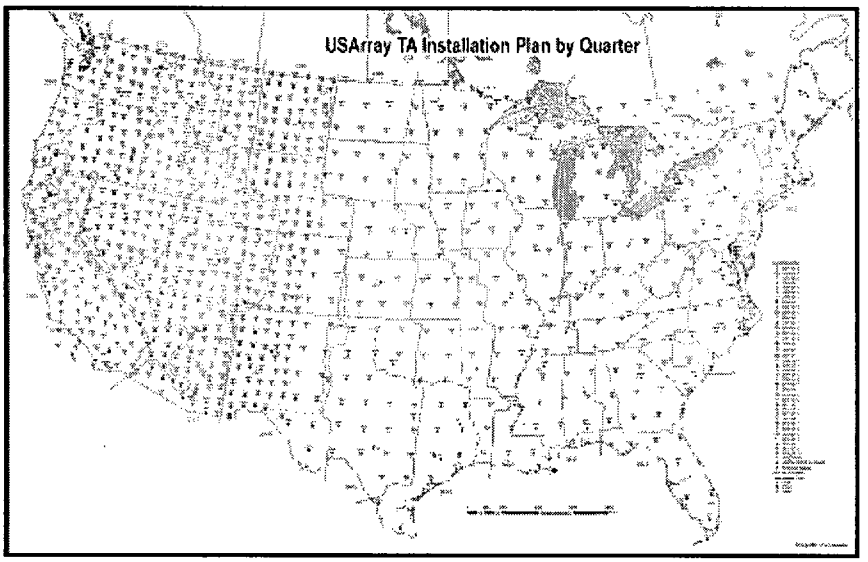
Estimate of annual acquisition and O&M costs for the 1-in-4, 250-station network in central and eastern US.

Year	Stations	Acquisition[1]	O&M[2]	Total
2011	50	$1,800,000	$ 400,000	$2,200,000
2012	50	$1,800,000	$ 800,000	$2,600,000
2013	50	$1,800,000	$1,200,000	$3,000,000
2014	50	$1,800,000	$1,600,000	$3,400,000
2015	50	$1,800,000	$2,000,000	$3,800,000
2016	–	–	$2,000,000	$2,000,000

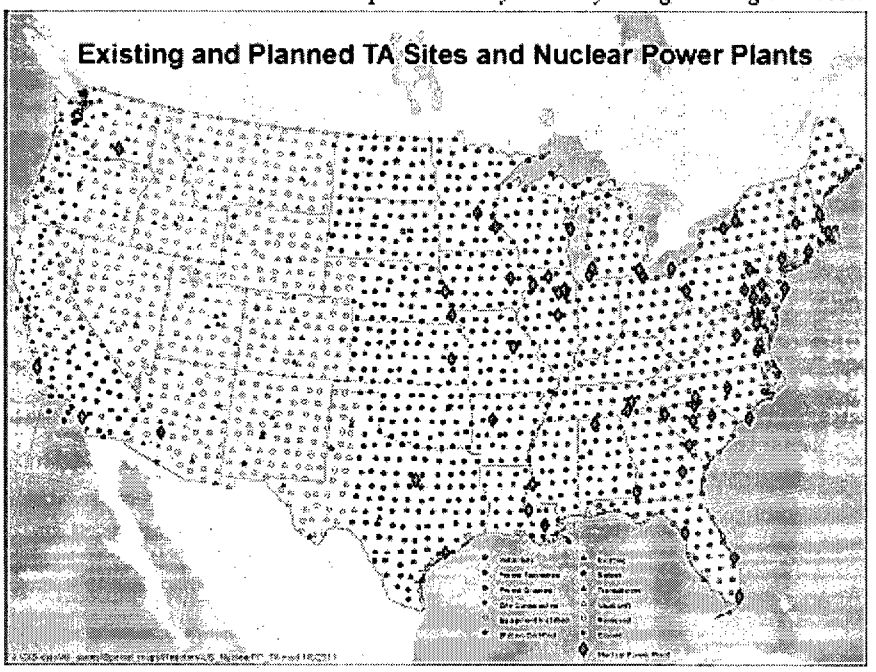
[1] Assumes upgrades to six channel data loggers with strong motion sensors.

[2] Assumes a conservative estimate of $8,000/station/year.

The 1-in-4, 250-station network that could be created in the central and eastern US by "leaving behind" one out of every four Transportable Array stations during the years 2011 through 2015.



A large majority of nuclear power plants are located in the central and eastern parts of the US, where it is still possible to "leave behind" 1-in-4 Transportable Array stations for long-term regional observations.



List of Questions

Natural Hazards and Ground Shaking Design Levels 1

1) Did the Japanese underestimate the size of the maximum credible earthquake that could affect the plants? 1

2) Can a very large earthquake and tsunami happen here? 1

3) Has this changed our perception of Earthquake risk? 1

4) What magnitude earthquake are US plants designed to? 1

5) How many US reactors are located in active earthquake zones (and which reactors)? 2

6) How many reactors are along coastal areas that could be affected by a tsunami (and which ones)? 2

7) If the earthquake in Japan was a larger magnitude than considered by plant design, why can't the same thing happen in the US? 2

8) If the earthquake in Japan was a larger magnitude than considered by plant design, why can't the same thing happen in the US? 3

9) What if an earthquake like the Sendai earthquake occurred near a US plant? 3

10) What would be the results of a tsunami generated off the coast of a US plant? (Or why are we confident that large tsunamis will not occur relatively close to US shores?) 3

11) Can this happen here i.e. an earthquake that significantly damages a nuclear power plant? Are the Japanese plants similar to U.S. plants? 3

12) What level of earthquake hazard are the US reactors designed for? 3

13) Does the NRC consider earthquakes of magnitude 8.9? 4

14) What are the definitions of the SSE and OBE? 4

15) What is the likelihood of the ground motions occurring over the life of the plant? 5

16) What is magnitude anyway? What is the Richter Scale? What is intensity? 5

17) 6

Design Against Natural Hazards & Plant Safety in the US 6

18) Are power plants designed for Tsunami's? 6

19) What level of Tsunami are we designed for? 6

20) How was the seismic design basis for an existing nuclear power plant established? 6

21) Is there margin above the design basis? 6

22) Are US plants safe? 7

23) Was the Japanese plant designed for this type of accident? Are US plants? 7

24) Why do we have confidence that US nuclear power plants are adequately designed for earthquakes and tsunamis? 7

25) Can this happen here i.e. an earthquake that significantly damages a nuclear power plant? Are the Japanese plants similar to U.S. plants? 7

26) Are US plants susceptible to the same sort of loss of all power? 8

27) Could an accident like the one at Japan's Fukushima Daiichi nuclear plant happen in the United States? 8

28) Should U.S. nuclear facilities be required to withstand earthquakes and tsunamis of the kind just experienced in Japan? If not, why not? 8

29) Can you summarize the plant seismic design basis for the US plants? Are there any special issues associated with seismic design? 9

30) How do we know that the equipment in plants is safe in earthquakes? 9

31) How do we know equipment will work if the magnitude is bigger than expected, like in Japan? 9

32) Are US plants susceptible to the same kind of loss of power as happened in Japan? 9

33) How do we know that the EDGs in Diablo Canyon and SONGS will not fail to operate like in Japan? 9

34) Is all equipment at the plant vulnerable to tsunami? 10

35) What protection measures do plants have against tsunami? 10

36) Is there a risk of loss of water during tsunami drawdown? Is it considered in design? 10

37) Are nuclear buildings built to withstand earthquakes? What about tsunami? 10

38) Are aftershocks considered in the design of equipment at the plants? Are aftershocks considered in design of the structure? 10

39) Are there any special issues associated with seismic design at the plants? For example, Diablo Canyon has special requirements. Are there any others? 10

40) Is the NRC planning to require seismic isolators for the next generation of nuclear power plants? How does that differ from current requirements and/or precautions at existing U.S. nuclear power plants? 10

41) Are there any U.S. nuclear power plants that incorporate seismic isolators? What precautions are taken in earthquake-prone areas? 11

42) Do you think that the recent Japan disaster will cause any rethinking of the planned seismic isolation guidelines, particularly as it regards earthquakes and secondary effects such as tsunamis? 11

About Japanese Hazard, Design and Earthquake Impact 12

43) Was the damage done to the plants from the Earthquake or the Tsunami? 12

44) What is the design level of the Japanese plants? Was it exceeded? 12

45) What are the Japanese S_1 and S_s ground motions and how are they determined? 12

46) Did this earthquake affect Kashiwazaki-Kariwa NPP? 13

47) How high were the tsunami at the plants? 13

What happened in US Plants during the earthquake? 14

48) Was there any damage to U.S. reactors from either the earthquake or the resulting tsunami? 14

49) Have any lessons for US plants been identified? 14

Future Actions, Reassessment of US Plants and GI-199 15

50) What is the NRC doing about the emergencies at the nuclear power plants in Japan? Are you sending staff over there? 15

51) With NRC moving to design certification, at what point is seismic capability tested – during design or modified to be site-specific? If in design, what strength seismic event must these be built to withstand? 15

52) Is the earthquake safety of US plants reviewed once the plants are constructed? 16

53) Does the NRC ever review tsunami risk for existing plants? 16

54) Does GI-199 consider tsunami? 16

55) What is Generic Issue 199 about? 16

56) Where can I get current information about Generic Issue 199? 16

57) How was the seismic design basis for an existing nuclear power plant established? 16

58) Is there margin above the design basis? 17

59) Are all U.S. plants being evaluated as a part of Generic Issue 199? 17

60) Are the plants safe? If you are not sure they are safe, why are they not being shut down? If you are sure they are safe, why are you continuing evaluations related to this generic issue? 17

61) What do you mean by "increased estimates of seismic hazards" at nuclear power plant sites? 18

62) What do the following terms mean? 18

63) Let's say there's an estimate expressed as "2.5E-06." (I'm looking at Table D-2 of the safety/risk assessment of August 2010.) I believe that this expression means the same as 2.5 x 10^-06, or 0.0000025, or 2.5 divided by one million. In layman's terms, that means an expectation, on average, of 2.5 events every million years, or once every 400,000 years. Similarly, "2.5E-05" would be 2.5 divided by 100,000, or 2.5 events every 100,000 years, on average, or once every 40,000 years. Is this correct? 20

64) The GI-199 documents give updated probabilistic seismic hazard estimates for existing nuclear power plants in the Central and Eastern U.S. What document has the latest seismic hazard estimates (probabilistic or not) for existing nuclear power plants in the Western U.S.? 20

65) The GI-199 documents refer to newer data on the way. Have NRC, USGS et al. released those? I'm referring to this: "New consensus seismic-hazard estimates will become available in late 2010 or early 2011 (these are a product of a joint NRC, U.S. Department of Energy, U.S. Geological Survey (USGS) and Electric Power Research Institute (EPRI) project). These consensus seismic hazard estimates will supersede the existing EPRI, Lawrence Livermore National Laboratory, and USGS hazard estimates used in the GI-199 Safety/Risk Assessment." 20

66) What is the timetable now for consideration of any regulatory changes from the GI-199 research? 21

Seismic Probabilistic Risk Assessment (SPRA) 22

67) The NRC increasingly uses risk-information in regulatory decisions. Are risk-informed PRAs useful in assessing an event such as this? 22

Plant-Specific Questions 23

SONGS questions 23

68) SONGS received a white finding in 2008 for 125VDC battery issue related to the EDGs that went undetected for 4 years. NRC issued the white finding as there was increased risk that one EDG may not have started due to a low voltage condition on the battery on one Unit (Unit 2). Aren't all plants susceptible to the unknown? Is there any assurance the emergency cooling systems will function as desired in a Japan-like emergency? 23

69) Has the earthquake hazard at SONGS been reviewed like DCNPP is doing? Are they planning on doing an update before relicensing? 23

70) Is possible to have a tsunami at songs that is capable of damaging the plant? 23

71) Does SONGS have an emergency plan for tsunami? 23

72) Has evacuation planning at SONGS considered tsunami? 24

73) Is SONGS designed against tsunami and earthquake? 24

74) What is the height of water that SONGS is designed to withstand? 24

75) What about drawdown and debris? 24

76) Will this be reviewed in light of the Japan quake. 24

77) Could all onsite and offsite power be disrupted from SONGS in the event of a tsunami, and if that happened, could the plant be safely cooled down if power wasn't restored for days after? 24

78) Are there any faults nearby SONGS that could generate a significant tsunami? 25

79) What magnitude or shaking level is SONGS designed to withstand? How likely is an earthquake of that magnitude for the SONGS site? 25

80) Could SONGS withstand an earthquake of the magnitude of the Japanese earthquake? 25

81) What about the evacuation routes at SONGS? How do we know they are reasonable?..... 25

82) Regarding tsunami at Diablo and SONGS, is the tsunami considered separately from flooding in licensing? And from the design perspective, is the flood still the controlling event for those plants rather than the tsunami?..... 25

83) What is the design level flooding for DNCPP and SONGS? Can a tsunami be larger?..... 26

Diablo Canyon Questions..... 27

84) Now after the Japan tragedy, will the NRC finally hear us (A4NR) and postpone DC license renewal until seismic studies are complete? How can you be sure that what happened there is not going to happen at Diablo with a worse cast quake and tsunami?..... 27

85) The evacuation routes at DCNPP see are not realistic. Highway 101 is small...and can you imagine what it will be like with 40K people on it? Has the evacuation plan been updated w/ all the population growth?..... 27

86) Are there local offshore fault sources capable of producing a tsunami with very short warning times?..... 27

87) Are there other seismically induced failure modes (other than tsunami) that would yield LTSBO? Flooding due to dam failure or widespread liquefaction are examples..... 27

88) Ramifications of beyond design basis events (seismic and tsunami) and potential LTSBO on spent fuel storage facilities?..... 27

89) Why did a Emergency Warning go out for a 'tsunami' that was only 6 ft high? Do these guys really know what they're doing? Would they know it if a big one was really coming? Crying wolf all the time doesn't instill a lot of confidence..... 27

90) How big did the Japanese think a quake/tsunami could be before 3/11? Why were they so wrong (assuming this quake/tsunami was bigger than what they had designed the plant for)?..... 28

The Japanese were supposed to have one of the best tsunami warning systems around. What went wrong last week (both with the reactors and getting the people out...see #1, evacuation plan above)?..... 28

91) Regarding tsunami at Diablo and SONGS, is the tsunami considered separately from flooding in licensing? And from the design perspective, is the flood still the controlling event for those plants rather than the tsunami?..... 28

Indian Point Questions..... 29

92) Why is Indian Point safe if there is a fault line underneath it?..... 29

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Dean, Bill

From: Barkley, Richard
Sent: Friday, March 11, 2011 9:20 AM
To: Screnci, Diane; Sheehan, Neil; Lew, David; Wilson, Peter; Lorson, Raymond; Collins, Daniel; Walker, Tracy; Tifft, Doug; Dean, Bill; Kern, David; Clifford, James
Cc: Milligan, Patricia; McDermott, Brian; Scholl, Larry; Doane, Margaret
Subject: FW: Any Details You Can Share From Our Japanese Colleagues on Their Ongoing Plant Event & Nearby Evacuation?
Attachments: 110311_press_release_on_earthquake1 (2).pdf; News Releases No4_IAEA.docx; News Releases No.2_IAEA.docx

Importance: High

Just got this from my friend in OIP. The news clip below was posted by CNN 7 minutes ago.

From: Foggie, Kirk
Sent: Friday, March 11, 2011 9:15 AM
To: Barkley, Richard
Cc: Fragoyannis, Nancy; Mamish, Nader
Subject: RE: Any Details You Can Share From Our Japanese Colleagues on Their Ongoing Plant Event & Nearby Evacuation?

Rich,

This is what we received earlier this morning. Will send you updates later.

Kirk

From: Barkley, Richard
Sent: Friday, March 11, 2011 9:13 AM
To: Foggie, Kirk
Cc: Fragoyannis, Nancy; Mamish, Nader
Subject: Any Details You Can Share From Our Japanese Colleagues on Their Ongoing Plant Event & Nearby Evacuation?

Thanks!

Japanese authorities order precautionary evacuation near nuclear plant

By **the CNN Wire Staff**
March 11, 2011 9:10 a.m. EST
STORY HIGHLIGHTS

- **NEW:** Japan sends a military team and senior government officials to the nuclear plant
- Cabinet official: Efforts to cool a reactor at a nuclear power plant "are not going as planned"
- Workers cannot generate enough electricity to pump water into the cooling system
- Residents within 3 kilometers of the plant have been asked to evacuate

PPPP 12

(CNN) -- Workers at a nuclear power plant in north-central Japan are having trouble cooling the reactor and authorities have asked nearby residents to evacuate, Chief Cabinet Secretary Yukio Edano said at a news conference Friday.

The Fukushima Nuclear Power Plant was shut down after the earthquake that hit the country.

"This is a precautionary instruction for people to evacuate. There is no radioactive leakage at this moment outside of the facility," he said. "At this moment there is no danger posed to the environment."

Japan declared a state of atomic power emergency after the earthquake, the Kyodo News agency reported. The government is sending senior officials and a defense force team to the power plant, it said.

Edano said plant workers were having trouble generating sufficient electricity to pump water into the cooling system. They were using all available backup electricity, he said.

"The emergency shutdown has been conducted but the process of cooling down the reaction is currently not going as planned," he said.

Residents living within a 3-kilometer radius of the plant were asked to evacuate, while residents living within a zone 3 to 10 kilometers away were asked to stay inside their homes.

About 2,000 people were affected by the evacuation order, according to the Kyodo News Service.

Edano urged people to remain calm, saying there is plenty of time to evacuate.

The plant was damaged by the 8.9-magnitude earthquake that has caused widespread destruction across the country.

From: OST01 HOC
Sent: Friday, April 15, 2011 9:35 PM
To: LIA08 Hoc
Subject: RE: for Shift's One-Pager

Thanks completed

From: LIA08 Hoc
Sent: Friday, April 15, 2011 8:55 PM
To: OST01 HOC
Subject: for Shift's One-Pager

You can cut and paste from the attached, based the notes I just gave you.

Clyde

Liaison Team Coordinator
US Nuclear Regulatory Commission
email: lia08.hoc@nrc.gov
Desk Ph: 301-816-5185

PPPI 38

LT Turnover Notes
4/15/2011
Clyde Ragland (Swing Shift)

1. Review Task Tracker, LT Log, LT Chronology and Outlook email.

2. Provide updates to OST01 for the ET one-pager, produced near the end of each shift.

3. Consortium call - 2000 hrs; next call not until 4/18/11
   US Embassy Japan (Tim Cipullo) has taken over maintenance of the spreadsheet. We have worked with the embassy to get their distribution list to match ours and are maintaining a copy here just in case.

4. ENSURE ALL EMAILS go to FOIA folder. LT team has task for each workstation send all sent and received email for the day at midnight each night. Action for 2300 to 0700 shift.

5. As of Saturday 4/16/11 the Liaison Team will be responsible for the revision and distribution of the NRC Daily Status Update. The update is distributed daily at noon (12:00). The distribution list is located on workstation LIA07. The procedure is posted in the LT Chronology and on the LIA08 (LT Coordinator) workstation desktop under "Team Toolboxes".

6. As of 4/10/11, all emails received by other LT accounts are being auto-forwarded to LIA08 (LT Coordinator). Delete duplicates, as opposed to forwarding them to the FOIA folder.

7. FSME now has the lead on the 2000 HHS call with 50 states and federal partners. (See Kim Morgan Butler email).

8. Mark Schaffer (at IAEA) has requested permission to share the NRC SitRep with the Chinese government, OIP (Kirk Foggie / Steve Bloom are working).

9. SEN Markey's office: One outstanding question "was there a pressure vessel rupture on unit 2"? GEH is performing analysis and was supposed to provide us an answer this evening (4/15). Tim Riley is OCA POC.

10. The following documents are now located on the LIA08 PC Desktop, under "TEAM TOOLBOXES":

    a. LT Coordinator Schedule Rev XX (Updated by Jeff Temple)
    b. Recurring Daily Actions and Calls Rev XX (Updated by LT Coord with input from others)
    c. JAPAN TRAVELER-ContactInfoList (date) – list of Japan team and reliefs with est. date of departure and est. date of return (PII) (Updated by OIP)
    d. NRC Daily Status Update Procedure (Daily SitRep) (Updated by LT Coord)
    e. LT Turnover Notes (updated by each LT Coord)
    f. Ops Center Transition Plan to Reduce Staffing for Japan Event (date)

(Each LT Coordinator needs to step up and update these documents as necessary, or ensure that the most current version is uploaded to the Desktop, as appropriate)
(If we again stand up the other LT positions for the Japan event, these docs should probably be transferred to the WebEOC site, under LT Misc. Document Collection)

11. WATCHBILL ISSUES:
    a. Dayshift 4/17 thru 4/19 need to be filled. Jake Zimmerman was scheduled for 4 dayshifts in a row (4/16 – 4/19), but we found out today that he is on leave! Clyde will come back in at 7AM on 4/16, but we still need to fill the next 3 dayshifts – Jeff Temple has been informed and will work on this on 4/16.
    b. Dayshift 4/26 needs to be filled. Lisa Wright cannot work on 4/26.

Dean, Bill

From: Dean, Bill
Sent: Sunday, March 13, 2011 12:05 AM
To: Lew, David; Roberts, Darrell; Wilson, Peter; Clifford, James; Weerakkody, Sunil; Miller, Chris; Lorson, Raymond; Collins, Daniel; Baker, Pamela; Walker, Tracy
Cc: Sheehan, Neil; Screnci, Diane; Tifft, Doug; McNamara, Nancy; Hansell, Samuel
Subject: Re: Summary of 11:30 PM Briefing on japan event.

Not much new to report wrt Fukushima Daiichi as info flow is still patchy. Unit 1 status is same as at 3:30 call. Unit 2 seems ok but may need to vent containment at some point due to slowly increasing pressure as no containment cooling.

Unit 3 has had reports of possible core uncovery since Pressure has dropped below high pressure injection setpoints and no low pressure cooling yet. But these are sketchy details at best.

There is a concurrent call at deputies level as different govt agencies are miscontruing the situation or getting conflicting info, so a need to get our govt aligned.

The german govt gave direction to its embassy to evacuate its citizens (with no basis it admitted) creating excitement with all the embassies including our own. In fact, Jim Trapp is en route to Japan to likely serve as nuclear expert to the embassy. Tony Ulses of RES is there now as part of a USAID team that we sent.

Talking points are being developed for RSLO use tomorrow for outreach to States. Also, Q and A associated with a US focus are currently with Chmn to be released tomorrow.

Chmn has encouraged white house to take a role in providing official govt spokesperson(s) so that the current ilk on networks like CNN, etc, who are tossing out a lot of disinformation, can be negated.

Next call is at 0730 tomorrow which Sam Hansell as RDO will cover.
Bill Dean
Regional Administrator
Region I, USNRC
Sent from NRC BlackBerry

From: Lew, David
To: Dean, Bill; Roberts, Darrell; Wilson, Peter; Clifford, James; Weerakkody, Sunil; Miller, Chris; Lorson, Raymond; Collins, Daniel; Baker, Pamela; Walker, Tracy
Cc: Dapas, Marc; Sheehan, Neil; Screnci, Diane; Tifft, Doug; McNamara, Nancy; Hansell, Samuel
Sent: Sat Mar 12 15:54:35 2011
Subject: Summary of 3:30 pm TA Briefing

Borchardt provided update

- Still operating on limited information.
- Deputies Meeting at the White House with significant focus on the nuclear event.
- Two NRC staff dispatched: one USAID and other on commercial flight
- NRC is minding its role and allow the White House to carry the messages
- NRC has for objectives
  1. Continue monitoring to the situation best that we can, given limited information.
  2. Outreach to IAEA and proposing IAEA as the point of contact for Japan.
  3. Further development of NRC questions and answers (one set is associated with what we know about Japan – will need to be very factual and not speculate; second set of questions and answers will focus will be on the domestic industry. Expect the public/media focus to turn toward domestic in the next day or so.
  4. Interaction with DHS and federal agencies, including plume plot, possible exposure models, and monitoring on the west coast.
- FEMA has stood down and operating under normal weekend staffing.

PPPP\4

New plant updates

- Most attention is on Unit 1
- Unit 2 appears to be shut down safely
- Tsunami interrupted diesel fuel flow or diesel cooling flow which was above ground.
- For some time, the core was uncovered and some fuel damage occurred.
- Believed that the explosion was either a steam explosion or hydrogen explosion.
- Seawater is being used in two ways. Borated seawater to inject into the reactor vessel and seawater to fill basement to cool the torus.
- Not getting indications of a degrading situation.

From: Lew, David
Sent: Saturday, March 12, 2011 12:52 PM
To: Dean, Bill; Roberts, Darrell; Wilson, Peter; Clifford, James; Weerakkody, Sunil; Miller, Chris; Lorson, Raymond; Collins, Daniel; Baker, Pamela; Walker, Tracy
Cc: Dapas, Marc; Sheehan, Neil; Screnci, Diane; Tifft, Doug; McNamara, Nancy
Subject: OEDO/OD/RA conference call

Noon today, the Executive Team held a conference call with the Office Directors and the Regional Administrators. Bill, Neil Sheehan and I participated in the call. (Bill/Neil, please add anything I missed or correct/clarify as needed). There will be a TA call at 3:30 pm.

- Limited information from our Japanese counterparts (need to be respectful of ongoing event response)
- Much information is second hand via IAEA, industry (via INPO/WANO), TEPCO website information
- NRC external communications will be via the HQs Liaison Team and OPA. Filter requests through the HOO.
- NRC remains in the monitoring mode.
- Chairman attended a meeting with White House. Marty Virgilio participated by VTC.
- Assistance offer to Japanese regulators, but do not currently need NRC support.
- US team deployed consisting of 60-70 people to assess the disaster (not limited to nuclear). NRC has supplied one team member who will be a technical consultant. A second staffed is trying to get on a flight to Japan to support the team and the US embassy.
- Parts of the industry mustering to offer industry support.
- GE is working with Exelon to run some simulator scenarios, Dresden unit most similar to the site.

Unconfirmed information about plants

- Eleven (11) reactor units in the area, but Fukushima Daiichi was hit the hardest. That site has six units. The concerns are currently focused on Units 1 and 2 (Unit 3 is in cold shutdown and the other three were in refueling).
- The Tsunami result is an extended loss of AC. Generators have been delivered to the site but no information that it is connected. Additional DC power has been to support operation of various valves and instruments.
- Fukushima Unit 1 explosion in the reactor building (metal siding taken off the of the reactor building).
- RCS and primary containment are both intact.
- Possible hydrogen detonation but no confirmation.
- Prior to this, venting of the primary containment which was successful in reducing pressure by half.
- Reactor water level was below top of active fuel
- Cs and Iodine detected outside facility indicating that core damage was likely
- Rad levels at the site boundary had been at 100 mrem/hr but now has decreased to 7 mrem per hour
- The licensee was filling containment with borated seawater
- Some workers injured at Unit 1 at the time of the video
- Unit 2 continuing to work through SBO, suppression pool at saturation temperature

Dave

From: PMT09 Hoc
Sent: Monday, March 14, 2011 4:50 PM
To: Hoc, PMT12
Subject: FW: Request from the States

From: LIA04 Hoc
Sent: Monday, March 14, 2011 4:24 PM
To: Burnell, Scott
Cc: LIA06 Hoc; LIA08 Hoc; Turtil, Richard; Virgilio, Rosetta; Rautzen, William; Ryan, Michelle; Rivera, Alison; Lukes, Kim; Flannery, Cindy; RST01 Hoc; PMT09 Hoc
Subject: FW: Request from the States

Can you please let me know how to reply to this?

From: McNamara, Nancy
Sent: Monday, March 14, 2011 4:20 PM
To: LIA04 Hoc
Cc: Tifft, Doug
Subject: Request from the States

We had a request from the States that if HQs rejects a question from the States that has been submitted, to please let the RSLOs know so we may tell them versus just letting them hang thinking we are getting them the answer.

PPPP/5

From: LIA04 Hoc
Sent: Monday, March 14, 2011 6:06 PM
To: Flannery, Cindy; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michelle; Turtil, Richard; Virgilio, Rosetta; Barker, Allan; Browder, Rachel; Collins, Elmo; Dean, Bill; Erickson, Randy; Heck, Jared; Logaras, Harral; Maier, Bill; McCree, Victor; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena
Subject: RE: Request from the States

Copied from the LT Director in response to the State Questions -

This is email is primarily for Charlie and Rosetta, to close the loop. We discussed the need for providing consistent information to the States, via the RSLO's, with the Executive Team and the Chairman a few minutes ago. The Chairman directed us to coordinate with FEMA since they have an established relationship with the States. We settled on working with OPA to provide the information tailored to our best extent to the questions and concerns that would be expressed by the States, and provide to FEMA for awareness and commonality, and then the RSLO's for sharing.

A broad conference call with all States is not currently being contemplated, we'd like to see how providing a common set of information works first.

Tim McGinty , LT Director

From: McNamara, Nancy
Sent: Monday, March 14, 2011 4:20 PM
To: LIA04 Hoc
Cc: Tifft, Doug
Subject: Request from the States

We had a request from the States that if HQs rejects a question from the States that has been submitted, to please let the RSLOs know so we may tell them versus just letting them hang thinking we are getting them the answer.

PPPP|6

From: OST01 HOC
Sent: Saturday, April 16, 2011 10:15 PM
To: Hoc, PMT12
Subject: RE: NRC Status Update - PMT edit

Thanks Michelle! Changes have been made.

From: Hoc, PMT12
Sent: Saturday, April 16, 2011 9:55 PM
To: OST01 HOC
Subject: RE: NRC Status Update - PMT edit

PMT edits attached.

PMT

From: OST01 HOC
Sent: Saturday, April 16, 2011 4:09 PM
To: LIA08 Hoc; Hoc, PMT12; RST01 Hoc; RST07 Hoc; RST08 Hoc; RST09 Hoc
Subject: NRC Status Update

Here is a draft word version of the current status update. Please edit throughout your shift and provide changes to me by 2200 EDT for the next Status Update. Thank you,

EST

PPPP17

From: LIA04 Hoc
Sent: Monday, March 14, 2011 3:40 PM
To: LIA03 Hoc; LIA02 Hoc
Subject: FW: POC for Naval Reactors Dosimetry

FYI

From: Franovich, Rani
Sent: Monday, March 14, 2011 3:37 PM
To: LIA04 Hoc; LIA06 Hoc
Subject: FW: POC for Naval Reactors Dosimetry

FYI...

From: LIA01 Hoc
Sent: Monday, March 14, 2011 8:41 AM
To: Ulses, Anthony
Cc: Franovich, Rani
Subject: POC for Naval Reactors Dosimetry

Tony,

We are giving Naval Reactors your name as the POC for delivery of dosimetry for NRC personnel to the US Embassy. I am awaiting a call from NR, and I will let you know of any information I receive. If you are not the right person, please let me know of a better POC.

Either way, please send a quick reply to let me know that you received this.

Thanks,
Scott Sloan
Federal Liaison Desk
Headquarters Operations Center
(301) 816-5186

PPPP|8

From: LIA08 Hoc
Sent: Monday, March 14, 2011 2:43 PM
To: Ulses, Anthony
Cc: Trapp, James; LIA06 Hoc

Hey Tony,
The Executive Team has asked the Liaison Team to find out what non-radiological hazards our NRC folks may be exposed to over in Tokyo and any other location they may be dispatched to. I tried a Google search to get some information and have not been able to find anything. Can you let us know if you have heard any announcements, press releases, notices, etc. of non-rad health issues our folks should be aware? I suspect Tokyo is of primary interest for now... I am not sure of other locations our team may be sent to, but we can cross that bridge later.
Thanks,
Rani Franovich
LT Coordinator

PPPP/9

From: LIA08 Hoc
Sent: Sunday, April 17, 2011 2:31 PM
To: OST01 HOC
Cc: Hoc, PMT12; PMT01 Hoc; RST01 Hoc; LIA08 Hoc; Zimmerman, Roy
Subject: One Pager April 17 1500EDT
Attachments: One Pager - April 17 1500EDT.pdf

Please see attached.

Liaison Team Coordinator
US Nuclear Regulatory Commission
email: lia08.hoc@nrc.gov
Desk Ph: 301-816-5185

PPPP/10

From: Evans, Michele
Sent: Tuesday, March 15, 2011 9:36 PM
To: LIA04 Hoc; LIA03 Hoc
Cc: McGinty, Tim
Subject: FW: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing

Liason Team,

I've asked the ODs/RAs to update the list of staff potentially available to travel to Japan if we decide to send a second team to replace our first team. Please provide an answer for Cindy regarding expediting passports and copy me on the response. Thanks

Michele Evans
Acting Deputy OD, NSIR

From: Pederson, Cynthia
Sent: Tuesday, March 15, 2011 8:53 PM
To: Evans, Michele
Subject: Re: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing

Hi Michele,
Quick question. Do we have a way to get expedited passports for those that don't have one?
Thanks
(sent from Blackberry device)

From: Evans, Michele
To: Hackett, Edwin; Brenner, Eliot; Schmidt, Rebecca; Powell, Amy; Droggitis, Spiros; Doane, Margaret; Mamish, Nader; Dyer, Jim; Brown, Milton; Greene, Kathryn; Stewart, Sharon; Howard, Patrick; Miller, Charles; Moore, Scott; Cohen, Miriam; Tracy, Glenn; Haney, Catherine; Dorman, Dan; Johnson, Michael; Holahan, Gary; Leeds, Eric; Boger, Bruce; Grobe, Jack; Zimmerman, Roy; Campbell, Andy; Sheron, Brian; Uhle, Jennifer; Dean, Bill; Lew, David; McCree, Victor; Wert, Leonard; Casto, Chuck; Satorius, Mark; Pederson, Cynthia; Collins, Elmo; Howell, Art; Muessle, Mary; Andersen, James; Akstulewicz, Brenda; Belmore, Nancy; Quesenberry, Jeannette; Kreuter, Jane; Armstrong, Janine; Hudson, Sharon; Ellis, Marv; Hasan, Nasreen; Ronewicz, Lynn; Schumann, Stacy; Daniels, Stanley; Casby, Marcia; Thomas, Loretta; Walker, Dwight; Sprogeris, Patricia; Schwarz, Sherry; Ross, Robin; Cohen, Shari; Riddick, Nicole; Flory, Shirley; Veltri, Debra; Matakas, Gina; ODaniell, Cynthia; Miles, Patricia; Lee, Pamela; Dubose, Sheila; Buckley, Patricia; Tomczak, Tammy; Owen, Lucy; Tannenbaum, Anita; Gusack, Barbara; Harrington, Holly; Ricketts, Paul; Howell, Linda; Higginbotham, Tina; Ross, Brenda; Boyce, Thomas (OIS); Schaeffer, James; Jackson, Donald
Sent: Tue Mar 15 17:53:24 2011
Subject: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing

Everyone,

Please find attached 1) a list of current positions being staffed in the Ops Center and 2) the staff identified as available to support in Japan.

Regarding additional staff available to support in the ops center, the primary needs are for the specialized positions on the PMT and anyone with previous international experience in OIP.

PPPP/11

Regarding support in Japan, please provide any updates/changes to the list by COB March 17. The target time frame for sending these staff members is March 27-April 9, so please consider that when considering staff to put on the list.

Thanks for your support.

Michele

From: Cherry, Ronald C
To: Kelley, Karen D (IO/Tokyo)
Cc: Trapp, James; Ulses, Anthony
Subject: RE: 60 Minutes
Date: Tuesday, March 15, 2011 7:03:56 PM

Karen,

The NRC team that arrives in Tokyo this afternoon will have a communications officer. In the meantime, we'll follow up with NRC in Washington on this to get the go-ahead and guidance.

Thanks very much.

Ron

This email is UNCLASSIFIED.

From: Kelley, Karen D (IO/Tokyo)
Sent: Tuesday, March 15, 2011 11:14 PM
To: Cherry, Ronald C
Subject: Fw: 60 Minutes

Ron,

CBS TV's 60 Minutes is seeking an interview with an NRC official to discuss the nuclear plant issue. I understand they are seeking an on-the-record interview opportunity.

Is there anyone that would be willing to engage at this point? I would be happy to assist with this interview.

Please advise.

Karen

From: Ruetenik, Daniel <RuetenikD@cbsnews.com>
To: Kelley, Karen D (IO/Tokyo)
Sent: Tue Mar 15 09:57:57 2011
Subject: Re: 60 Minutes

Hi Karen,

Is there any chance you were able to find an NRC contact for us?

Regards,

Dan

PPPP/12

----- Original Message -----
From: Kelley, Karen D (IO/Tokyo) <KelleyK@state.gov>
To: Ruetenik, Daniel
Sent: Mon Mar 14 22:44:57 2011
Subject: Re: 60 Minutes

Hi Dan,

The consular officers in the field need to wait until I receive the clearance from State Department. I don't have that OK yet, although I have strongly recommended that this be approved.

I will take your request on the NRC interview up and see if there is a point of contact for you to talk to.

Karen

From: Ruetenik, Daniel <RuetenikD@cbsnews.com>
To: Kelley, Karen D (IO/Tokyo)
Sent: Mon Mar 14 22:28:03 2011
Subject: 60 Minutes

Karen,

We heard from Andy Utshig that you've asked him to hold off on talking to us. I would appreciate the chance to talk about your concerns on that.

Also - I am not sure if you're the right person to put this into, but we'd like to request an interview with members of the NRC team once they have finished their analysis. Speaking with 60 Minutes would be the best way to reach the largest audience and calm the growing anxiety amongst Americans about the dangers from the nuclear release.

If there's a contact with the NRC that I can put that request into directly I'd greatly appreciate if you could pass that on.

Regards,

Dan

From: LIA02 Hoc
Sent: Tuesday, March 15, 2011 8:01 AM
To: LIA06 Hoc
Subject: FW: NRC Japan Arrival Times
Attachments: Travel of NRC team to Japan ; Travel of NRC Team to Japan

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From: LIA02 Hoc
Sent: Tuesday, March 15, 2011 7:59 AM
To: Carter, Mary
Cc: 'RMTPACTSU_ELNRC'
Subject: NRC Japan Arrival Times

NRC Japan Travelers Flight Arrival Information (local time)

Devercelly - 04:15pm DL 0275

Kolb - 09:10am BA 0005
Foggie - 09:10am BA 0005
Smith - 09:10am BA 0005
Nakanishi - 09:10am BA 0005
Monninger - 09:10am BA 0005
Foster - 09:10am BA 0005
Cook - 09:10am BA 0005

Casto - 1:30pm AA 0175

PPPP/13

From: LIA03 Hoc
Sent: Tuesday, March 15, 2011 1:09 PM
To: LIA06 Hoc; LIA02 Hoc
Cc: Mamish, Nader; Doane, Margaret; Emche, Danielle; Ramsey, Jack; Dembek, Stephen
Subject: please distribute to ops team

Note to team:

OIP received a call from our counterparts with the Japan Ministry of Foreign Affairs. They are concerned about misconceptions resulting from translation issues. Their words were that they "shamefully realized translation errors." These errors led to misconceptions by NRC staff about events at the Fukushima facility Monday night. Please be aware that the Japanese may speak about events like they are actually happening when those actions or events are things that may happen and therefore in translation may be misconstrued. Before we act on any information, we need to verify whether events are current or possible.

A Japanese speaker (Tony Nakanishi) is part of the NRC team in route to Japan (arrival time approximately 8:10 tonight EDT). He needs to assist with translation in country, but we will still need to be aware of possible translation issues in the event Tony is not involved in the translation of information.

PPPP/14

From: LIA08 Hoc
Sent: Tuesday, March 15, 2011 7:27 PM
To: LIA06 Hoc
Subject: FW: Secretary Chu receives positive response from METI Minister on monitoring

-----Original Message-----
From: Trapp, James
Sent: Tuesday, March 15, 2011 7:09 PM
To: LIA01 Hoc; LIA07 Hoc; LIA02 Hoc; LIA08 Hoc; Harrington, Holly; McIntyre, David; Burnell, Scott; Taylor, Robert; Marshall, Jane; Gott, William; Grant, Jeffery
Subject: FW: Secretary Chu receives positive response from METI Minister on monitoring

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From: Cherry, Ronald C [CherryRC@state.gov]
Sent: Tuesday, March 15, 2011 7:00 PM
To: JapanEmbassy, TaskForce; Basalla, Suzanne I; Beed, John A; Berger, William (RDMA/OFDA); Forbes, James A
Cc: Alan Remick; Aleshia Duncan; Duncan, Aleshia D; Trapp, James; James Trapp (BB); Mears, Jeremy M; Morales, Russell A; Nesheiwat, Julia; Tamada, Yoshimi; Ulses, Anthony; Uchida, Koichi
Subject: FW: Secretary Chu receives positive response from METI Minister on monitoring

All -- Please note GOJ acceptance of our offer to conduct aerial/ground monitoring. Also GOJ request for iodine tablets.

Alan -- Please advise re: specs and numbers of AMS equipment.

Thank you.

Ron

This email is UNCLASSIFIED-----Original Message-----
From: Aoki, Steven [mailto:Steven.Aoki@nnsa.doe.gov]
Sent: Wednesday, March 16, 2011 12:04 AM
To: 'jroos@state.gov'; Zumwalt, James P; Basalla, Suzanne I; Cherry, Ronald C; Duncan, Aleshia; Remick, Alan
Cc: NITOPS; Connery, Joyce; Mustin, Tracy; Poneman, Daniel; DAgostino, Thomas; Hurlbut, Brandon
Subject: Secretary Chu receives positive response from METI Minister on monitoring

Mr. Ambassador:

Energy Secretary Chu spoke by phone this morning to METI Minister

PPPP/15

Kaieda. Key points from the conversation:

Minister Kaieda thanked Sec. Chu for support, updated him on reactors
* FD #1 and #3 are regaining stability
* FD #2 may have damage to the separation chamber, attempting to stop it from escalating
* Outside of 20KM, radiation levels have dropped to a level that would have a small to negligible impact on health.

The Secretary offered equipment / people /expertise, and expressed support

Minister Kaieda:
* Thanked S1 for US Fire trucks
* Said METI will meet with USG experts tomorrow
* Accepted our offer to use aerial and vehicle/ground based measurement equipment
* Asked for specifications and numbers on what equipment was available
* Asked if we could share iodine tablets with GOJ

S1 indicated he would provide that information.

NSC Deputies were informed of this conversation this morning, possibly after you had left the conference. We are working on meeting Kaieda's requests. You may want to confirm Japan's acceptance of our offer with the Cabinet Secretariat, as we will need Japanese points of contact at the operational level. Please note that our hope is to deploy DOE technical experts to take data and operate measuring equipment from helicopter and/or ground platforms, not simply to give instruments to the Japanese.

Please feel free to contact DOE through our Tokyo staff, directly to Deputy Secretary Poneman or through our Operations Center at 202 586-8100.

v/r
Steve Aoki

From: OST05 Hoc
Sent: Wednesday, March 16, 2011 1:24 PM
To: Barker, Allan
Subject: RE: FEMA Region V Request

Good luck, Allan

From: Barker, Allan
Sent: Wednesday, March 16, 2011 1:12 PM
To: OST05 Hoc
Subject: RE: FEMA Region V Request

Thanks for the "green light" to proceed.....Allan

From: OST05 Hoc
Sent: Wednesday, March 16, 2011 12:09 PM
To: Barker, Allan
Cc: LIA04 Hoc; Heck, Jared; Logaras, Harral; Flannery, Cindy; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michael; Turtil, Richard; Virgilio, Rosetta; Browder, Rachel; Erickson, Randy; Maier, Bill; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena
Subject: RE: FEMA Region V Request

Just spoke to Charlie Miller, who is on Executive Team and he said OK to use whatever is publicly available (press releases).

Keep an eye out for NRC's press release, which is being coordinated with the White House – will not get a heads up – will be issued immediately (when approved)

Rosetta
NRC State Liaison
OST05.HOC@nrc.gov

From: Barker, Allan
Sent: Wednesday, March 16, 2011 12:44 PM
To: OST05 Hoc
Cc: LIA04 Hoc; Heck, Jared; Logaras, Harral
Subject: FEMA Region V Request

Liaison Team,

I have received a request to present at an "All-Staff" meeting for FEMA Region V tomorrow at 11:00am at their Chicago downtown office. I did verify that FEMA Region V receives the NRC Update Status reports on the event. The presentation would be on general information about the reactor and information that has been developed by OPA. The presentation would be no more than 20 minutes in length. I am requesting approval to conduct the presentation. I would maintain my presentation content within the federal family. I would like to provide a response this afternoon to FEMA Region V.

PPPP|16

Thanks.....Allan

From: Hoc, PMT12
Sent: Wednesday, April 27, 2011 9:12 PM
To: OST01 HOC
Subject: updated one-pager from PMT
Attachments: Japan One Pager 2100 EDT 4-27-11.doc

PPPP/17

From: LIA06 Hoc
Sent: Wednesday, March 16, 2011 1:40 PM
To: julie.a.bentz@who.eop.gov
Subject: request for infomration

Julie,

You and I talked this morning regarding your questions on the 4 points that Chairman Jaczko provided to the White House on the Japanese event. I was wondering if you could please help us in tracking down the draft of the Q&As that the White House is working on? We are having trouble getting our eyes on the current draft.

Thank you for any help or information you can provide.

Mark Lombard, LT Director
US NRC Operations Center

PPPP/18

From: LaVie, Steve
Sent: Wednesday, March 16, 2011 2:33 PM
To: PMT03 Hoc
Subject: FW: Secretary Chu receives positive response from METI Minister on monitoring

-----Original Message-----
From: Trapp, James
Sent: Tuesday, March 15, 2011 8:08 PM
To: LaVie, Steve
Subject: FW: Secretary Chu receives positive response from METI Minister on monitoring

---

From: Cherry, Ronald C [CherryRC@state.gov]
Sent: Tuesday, March 15, 2011 7:00 PM
To: JapanEmbassy, TaskForce; Basalla, Suzanne I; Beed, John A; Berger, William (RDMA/OFDA); Forbes, James A
Cc: Alan Remick; Aleshia Duncan; Duncan, Aleshia D; Trapp, James; James Trapp (BB); Mears, Jeremy M; Morales, Russell A; Nesheiwat, Julia; Tamada, Yoshimi; Ulses, Anthony; Uchida, Koichi
Subject: FW: Secretary Chu receives positive response from METI Minister on monitoring

All -- Please note GOJ acceptance of our offer to conduct aerial/ground monitoring. Also GOJ request for iodine tablets.

Alan -- Please advise re: specs and numbers of AMS equipment.

Thank you.

Ron

This email is UNCLASSIFIED-----Original Message-----
From: Aoki, Steven [mailto:Steven.Aoki@nnsa.doe.gov]
Sent: Wednesday, March 16, 2011 12:04 AM
To: 'jroos@state.gov'; Zumwalt, James P; Basalla, Suzanne I; Cherry, Ronald C; Duncan, Aleshia; Remick, Alan
Cc: NITOPS; Connery, Joyce; Mustin, Tracy; Poneman, Daniel; DAgostino, Thomas; Hurlbut, Brandon
Subject: Secretary Chu receives positive response from METI Minister on monitoring

Mr. Ambassador:

Energy Secretary Chu spoke by phone this morning to METI Minister Kaieda. Key points from the conversation:

PPPP/19

Minister Kaieda thanked Sec. Chu for support, updated him on reactors

* FD #1 and #3 are regaining stability
* FD #2 may have damage to the separation chamber, attempting to stop it from escalating
* Outside of 20KM, radiation levels have dropped to a level that would have a small to negligible impact on health.

The Secretary offered equipment / people /expertise, and expressed support

Minister Kaieda:

* Thanked S1 for US Fire trucks
* Said METI will meet with USG experts tomorrow
* Accepted our offer to use aerial and vehicle/ground based measurement equipment
* Asked for specifications and numbers on what equipment was available
* Asked if we could share iodine tablets with GOJ

S1 indicated he would provide that information.

NSC Deputies were informed of this conversation this morning, possibly after you had left the conference. We are working on meeting Kaieda's requests. You may want to confirm Japan's acceptance of our offer with the Cabinet Secretariat, as we will need Japanese points of contact at the operational level. Please note that our hope is to deploy DOE technical experts to take data and operate measuring equipment from helicopter and/or ground platforms, not simply to give instruments to the Japanese.

Please feel free to contact DOE through our Tokyo staff, directly to Deputy Secretary Poneman or through our Operations Center at 202 586-8100.

v/r
Steve Aoki

Dean, Bill

From: Dean, Bill
Sent: Wednesday, March 16, 2011 10:43 PM
To: Ruland, William
Subject: RE: A link for information about the Japanese reactors.

super. thanks

From: Ruland, William
Sent: Wednesday, March 16, 2011 1:21 PM
To: Collins, Elmo; McCree, Victor; Satorius, Mark; Dean, Bill
Subject: A link for information about the Japanese reactors.

http://www.jaif.or.jp/english/

PPPP/20

Dean, Bill

From: Dean, Bill
Sent: Wednesday, March 16, 2011 12:58 PM
To: Barkley, Richard
Subject: FW:
Attachments: 110315-reactors-hmed-910p_grid-7x2.jpg

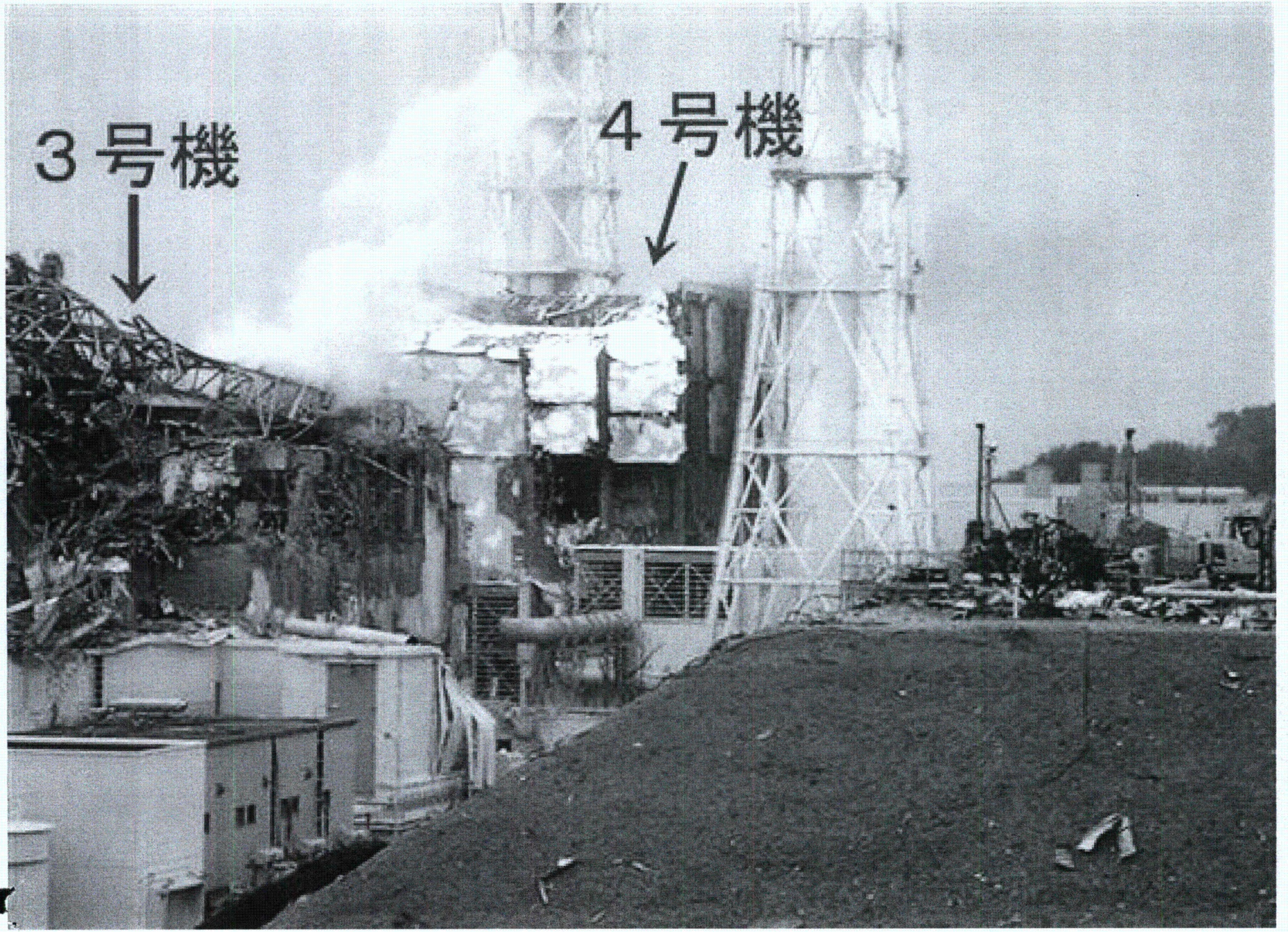
Bill

From: Wilson, Peter
Sent: Wednesday, March 16, 2011 12:35 PM
To: Dean, Bill; Lew, David; Weerakkody, Sunil; Roberts, Darrell; Clifford, James; Collins, Daniel; Lorson, Raymond
Subject: FW:

Attached is a very recent picture of Fukushima Unit 4. The damage is significant.

From: Schmidt, Wayne
Sent: Wednesday, March 16, 2011 12:00 PM
To: Wilson, Peter
Subject:

PPPP/21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Dean, Bill

From: LIA07 Hoc
Sent: Wednesday, March 16, 2011 7:13 PM
Subject: 1900 EDT (March 16, 2011) USNRC Earthquake/Tsunami SitRep
Attachments: USNRC Earthquake-Tsunami Update.031611.1900EDT.pdf

Attached, please find a 1600 EDT situation report from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami on March 13, 2011. This Update includes information related to NRC's evaluation of radiation measurements from the USS Ronald Reagan.
Please note that this information is "Official Use Only" and is only being shared within the federal family.
Please call the Headquarters Operations Officer at 301-816-5100 with questions.
-Sara

Sara K. Mroz
Communications and Outreach
Office of Nuclear Security and Incident Response
US Nuclear Regulatory Commission
sara.mroz@nrc.gov
LIA07.HOC@nrc.gov (Operations Center)

PPPD/22

From: Google Alerts
To: Brenner, Eliot
Subject: Google Alert - jaczko
Date: Wednesday, March 16, 2011 12:06:58 PM

News **2** new results for **jaczko**

Republican leaders express support for nuclear energy as Chu seeks funding for ...

Washington Post (blog)
Chu and Gregory **Jaczko**, the chairman of the US Nuclear Regulatory Commission, didn't mention the crisis in Japan in their prepared remarks for the hearing which was convened to address the energy department's budget. But key Republicans in the House **...**
See all stories on this topic »

Nuclear safety under question

Congress.org
Chu and NRC Chairman Gregory **Jaczko** continue to voice confidence that US generators are built to the highest safety standards. But Sen. Mary L. Landrieu, D-La., said the Japanese thought their plants were well-designed, too. **...**
See all stories on this topic »

PPPP/23

From: LIA08 Hoc
Sent: Thursday, April 28, 2011 3:05 PM
To: Droggitis, Spiros
Subject: RE: USNRC Emergency Operations Center Status Update

Categories: FOIA Forwarded

Spiros. Please let me know if the document Ned sent you is adequate, or TMI for Congressional folks (we seem to have gone from a 3 pager to a 6 pager for your congressional contacts). Jeff Temple

Liaison Team Coordinator
US Nuclear Regulatory Commission
email: lia08.hoc@nrc.gov
Desk Ph: 301-816-5185

From: Droggitis, Spiros
Sent: Thursday, April 28, 2011 2:00 PM
To: LIA08 Hoc
Subject: RE: USNRC Emergency Operations Center Status Update

Thanks

From: LIA08 Hoc
Sent: Thursday, April 28, 2011 1:40 PM
To: Droggitis, Spiros; Riley (OCA), Timothy
Subject: USNRC Emergency Operations Center Status Update

This information is **Official USE Only**

PPPP/24

From: Miller, Chris
Sent: Wednesday, March 16, 2011 2:09 AM
To: LIA06 Hoc
Cc: Miller, Chris
Subject: letter recommending aerial monitoring system
Attachments: roncherry.docx

PPPP/25

Ron,

Below is USNRC rationale for deployment of the DOE aerial measurement system. We believe this is a high priority to enable gathering essential data for the determination of informed protective action recommendations, including those for US citizens. We would appreciate your action to help expedite this system's deployment.

DOE aerial measurement system can provide useful information that helps officials understand the event that has occurred, refine protective actions, and characterize the fallout.

Fixed wing aircraft aerial measuring system

- Can rapidly map residual fall out pattern and intensity of contaminated materials that may have deposited after plume passage
  - Can define expanded evacuation and sheltering areas for both plume and post plume phase
  - Can obtain isotopic information which also helps to refine the source term as well as protective action guidelines.
  - Can identify areas of concern for agricultural products and potential food embargos
  - Dose rate values over the Fukushima site and offsite

Please let us know if you need additional information regarding this rationale. Thank you very much for your assistance in this matter.

Chris Miller
USNRC
301-816-5100

From: RST01 Hoc
Sent: Wednesday, March 16, 2011 2:51 PM
To: LIA06 Hoc
Subject: FW: RST Bullets

From: RST01 Hoc
Sent: Wednesday, March 16, 2011 1:17 PM
To: Kozal, Jason; Dudek, Michael; Anderson, Joseph
Subject: RST Bullets

Reactor Safety Team:

Done

- Two teams of BWR Technical Experts.
- Arranged and coordinated delivery of Fire Pumps to the Site to support Reactor and Containment Cooling with loss of Off-site and Emergency Power.
- Provided recommendations for core cooling and spent fuel pool cooling.
- Followed events closely to assess status of all Fukushima Daiichi Units following the earthquake and tsunami in order to provide updates to US Government Authorities.
- Developed Q&A's on Seismic and Tsunami events related to US facilities.

Doing

- Arranging with the US Military to send Pumping Assets to assist with Cooling the fuel Pools
- Arranging with INPO to send 20,000lbs of Boron for shipment to Japan.
- Provided a rough schematic for 4 trains of temporary spent fuel pool cooling to Military and INPO.
- We are coordinating assistance from private industry for various assets and resource including personnel to assist in Japanese efforts to cool reactors and fuel pool.
- Imbedding Office of Naval Reactor personnel into the NRC Operations Center reactor safety team.

Planning

- Arranging for High Robots with remote capabilities to be transported as requested from Japan.
- Attempting to locate back-up diesel Pumper Trucks to send to ensure additional cooling capabilities as needed.
- Coordinating with Protective Measures Team and defense threat reduction agency to develop dose profiles above fuel pools.
- Planning NRC Ops Center Staffing to support 24-7 coverage to assist Japanese government in mitigation of event.
- Coordinating with INPO for industry asset needs as required and requested by Japanese Authorities.

PPPP/2/6

From: LIA06 Hoc
Sent: Wednesday, March 16, 2011 12:16 AM
To: LIA08 Hoc
Subject: Japan Earthquake.doc
Attachments: Japan Earthquake.doc

Pls update the description section..

Japan Earthquake/Tsunami Periodic Operations Center Briefing List - March 15, 7:00 PM EDT

Recurring Meetings:

Time	Lead	Title	Description/Support/Source
0800	ET	Commissioners Assistants	Ops Center Status Update used as Source
0800	ET	Deputies Call – Secure VTC	Ops Center Status Update used as Source
1030	RST	INPO Info Exchange	Ops Center Status Update
1100	LIA	HHS ESF-8 Interagency Call	Ops Center Status Update
1930	Chairman	Commissioners Update	Status Update and Talking Points
2000	ET	Commissioners Assistants	Ops Center Status Update
2300	LIA	DOS Inter-agency Call	SITREP, Ops Center Status Update – DART

Other Related Meetings:

Boland, Anne

From: Lynch, James
Sent: Wednesday, March 16, 2011 3:39 PM
To: OST05 Hoc; Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; Maier, Bill; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena
Cc: LIA04 Hoc; Flannery, Cindy; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michael; Turtil, Richard; Virgilio, Rosetta; Collins, Elmo; Dean, Bill; McCree, Victor; Satorius, Mark; Boland, Anne; Louden, Patrick
Subject: RE: RASCAL projection

Cindy,

Thanks for getting back to me quickly. I told Cheryl Rogers (Wisconsin) that we could not provide the assumptions to States at this time. She understands but is puzzled that the US is telling Americans in Japan to evacuate to a distance further from the plant than what the Japanese government is telling its citizens. I told Cheryl that I would pass that comment to NRC decisionmakers.

-Jim

Jim Lynch
State Agreements Officer
Nuclear Regulatory Commission
Region III
2443 Warrenville Road
Lisle, IL 60532
630-829-9661
james.lynch@nrc.gov

From: OST05 Hoc
Sent: Wednesday, March 16, 2011 2:59 PM
To: Lynch, James; Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; Maier, Bill; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena
Cc: LIA04 Hoc; Flannery, Cindy; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michael; Turtil, Richard; Virgilio, Rosetta; Collins, Elmo; Dean, Bill; McCree, Victor; Satorius, Mark
Subject: RE: RASCAL projection

Jim and RSLOs,

The RASCAL inputs below are for your information. Please do not share this information outside of NRC.
Jim, would you please communicate to Cheryl Rogers that we are not able to share this information outside of the NRC at this time?

I've been advised by the Protective Measures Team that the following assumptions were made in RASCAL:

Unit #2: 33% core damage and containment leakage
Unit #3: damage to the spent fuel pool, 50% of fuel melted
Unit #4: spent fuel pool leaked and all of the fuel melted

I hope this provides the clarification that you were seeking.

PPPP/27

Regards,
Cindy Flannery
State Liaison

-----Original Message-----
From: Lynch, James
Sent: Wednesday, March 16, 2011 3:04 PM
To: OST05 Hoc
Cc: LIA04 Hoc; Logaras, Harral; Barker, Allan
Subject: FW: RASCAL projection

Would you please respond to Wisconsin on this? Thank you.

Jim Lynch
State Agreements Officer
Nuclear Regulatory Commission
Region III
2443 Warrenville Road
Lisle, IL 60532
630-829-9661
james.lynch@nrc.gov

From: Rogers, Cheryl K - DHS [Cheryl.Rogers@dhs.wisconsin.gov]
Sent: Wednesday, March 16, 2011 1:31 PM
To: Lynch, James
Subject: RASCAL projection

Jim,
Can you get the inputs for RASCAL outputs?
Cheryl

-----Original Message-----
From: Shober, Megan L - DHS
Sent: Wednesday, March 16, 2011 1:26 PM
To: Rogers, Cheryl K - DHS; Manor, Perry J - DHS
Subject: Did you see?

Cheryl and Perry,
NRC published RASCAL estimates for the Japanese reactor this morning and NRC is recommending the evacuation of US citizens out to 50 miles. They project 9.9 rem EDE at 50 miles and 48 rem thyroid CDE at 50 miles. This seems hard to believe. NRC did not share the input data for the RASCAL estimate.
http://www.nrc.gov/reading-rm/doc-collections/news/2011/11-050.pdf

-Megan

From: Evans, Michele
Sent: Wednesday, March 16, 2011 9:43 AM
To: LIA06 Hoc
Subject: RE: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing

Mark,

Actually, you don't need the list at this point and it is still being updated. Currently the list has 30 names on it. There has been no definition of the skill set of the next wave. Not ready to pass on yet.

Let me know time frame for expediting when you get that.

Thanks

Michele

From: LIA06 Hoc
Sent: Wednesday, March 16, 2011 9:37 AM
To: Evans, Michele
Subject: RE: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing

Sorry but the attachment did not come with it. Initial answer is that expedited passports can be obtained. Still pursuing through State regarding time frames. When you get a chance to get to your desktop email can you please send me the attachment with the list of names of the next wave of folks to go to Japan?

Thanks,

Mark Lombard, LT Director

From: Evans, Michele
Sent: Wednesday, March 16, 2011 9:17 AM
To: LIA06 Hoc
Subject: Fw: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing

Sent from an NRC Blackberry
Michele Evans

From: Pederson, Cynthia
To: Evans, Michele
Sent: Tue Mar 15 20:52:34 2011
Subject: Re: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing

Hi Michele,
Quick question. Do we have a way to get expedited passports for those that don't have one?
Thanks
(sent from Blackberry device)

PPPP/28

From: Evans, Michele
To: Hackett, Edwin; Brenner, Eliot; Schmidt, Rebecca; Powell, Amy; Droggitis, Spiros; Doane, Margaret; Mamish, Nader; Dyer, Jim; Brown, Milton; Greene, Kathryn; Stewart, Sharon; Howard, Patrick; Miller, Charles; Moore, Scott; Cohen, Miriam; Tracy, Glenn; Haney, Catherine; Dorman, Dan; Johnson, Michael; Holahan, Gary; Leeds, Eric; Boger, Bruce; Grobe, Jack; Zimmerman, Roy; Campbell, Andy; Sheron, Brian; Uhle, Jennifer; Dean, Bill; Lew, David; McCree, Victor; Wert, Leonard; Casto, Chuck; Satorius, Mark; Pederson, Cynthia; Collins, Elmo; Howell, Art; Muessle, Mary; Andersen, James; Akstulewicz, Brenda; Belmore, Nancy; Quesenberry, Jeannette; Kreuter, Jane; Armstrong, Janine; Hudson, Sharon; Ellis, Marv; Hasan, Nasreen; Ronewicz, Lynn; Schumann, Stacy; Daniels, Stanley; Casby, Marcia; Thomas, Loretta; Walker, Dwight; Sprogeris, Patricia; Schwarz, Sherry; Ross, Robin; Cohen, Shari; Riddick, Nicole; Flory, Shirley; Veltri, Debra; Matakas, Gina; ODaniell, Cynthia; Miles, Patricia; Lee, Pamela; Dubose, Sheila; Buckley, Patricia; Tomczak, Tammy; Owen, Lucy; Tannenbaum, Anita; Gusack, Barbara; Harrington, Holly; Ricketts, Paul; Howell, Linda; Higginbotham, Tina; Ross, Brenda; Boyce, Thomas (OIS); Schaeffer, James; Jackson, Donald
Sent: Tue Mar 15 17:53:24 2011
Subject: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing

Everyone,

Please find attached 1) a list of current positions being staffed in the Ops Center and 2) the staff identified as available to support in Japan.

Regarding additional staff available to support in the ops center, the primary needs are for the specialized positions on the PMT and anyone with previous international experience in OIP.

Regarding support in Japan, please provide any updates/changes to the list by COB March 17. The target time frame for sending these staff members is March 27-April 9, so please consider that when considering staff to put on the list.

Thanks for your support.

Michele

From: Erlanger, Craig
Sent: Wednesday, March 16, 2011 11:03 AM
To: Opara, Stella
Subject: RE: Additional Staff requirements outside Ops Center Long Term Staffing
Attachments: image001.gif

Brief overview of international experience please...

From: Opara, Stella
Sent: Wednesday, March 16, 2011 11:03 AM
To: Erlanger, Craig
Subject: RE: Additional Staff requirements outside Ops Center Long Term Staffing

Yes, I am interested.

From: Erlanger, Craig
Sent: Wednesday, March 16, 2011 10:51 AM
To: Baxter, Brad; Biddison, John; Chalk, Wayne; Coflin, Monika; Cubellis, Louis; Harris, Paul; Lee, Eric; Nerret, Amanda; Opara, Stella; Pederson, Perry; Resner, Mark; Rycyna, John; Tomlinson, John
Subject: FW: Additional Staff requirements outside Ops Center Long Term Staffing

Please let me know ASAP. Thanks

From: Correia, Richard
Sent: Wednesday, March 16, 2011 10:50 AM
To: Wastler, Sandra; Caldwell, Robert; Erlanger, Craig; Huyck, Doug; Shropshire, Alan
Subject: FW: Additional Staff requirements outside Ops Center Long Term Staffing

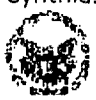
Please let me know ASAP if we have anyone that meets the "quals" below to assist OIP and if they would be willing to assist.

thx

From: Rheaume, Cynthia
Sent: Wednesday, March 16, 2011 10:45 AM
To: Holahan, Patricia; Layton, Michael; Correia, Richard; Westreich, Barry
Subject: RE: Additional Staff requirements outside Ops Center Long Term Staffing

All - Do we have anyone who would fit the bill?

Cynthia Rheaume
Director, Program Management, Policy Development and Analysis
Nuclear Security and Incident Response
(301)415-6538
Cynthia.Rheaume@nrc.gov



DPPP/29

From: Evans, Michele
Sent: Wednesday, March 16, 2011 9:38 AM
To: Abraham, Susan; Rheaume, Cynthia
Cc: Holahan, Patricia; Correia, Richard; Layton, Michael; Westreich, Barry
Subject: FW: Additional Staff requirements outside Ops Center Long Term Staffing
Importance: High

Susan/Cyndi,

Please handle this for NSIR and respond if we have anyone. Maybe other parts of NSIR (not DPR) can help out with this request.

thanks

From: Muessle, Mary
Sent: Wednesday, March 16, 2011 9:32 AM
To: Evans, Michele; Hackett, Edwin; Brenner, Eliot; Schmidt, Rebecca; Powell, Amy; Droggitis, Spiros; Doane, Margaret; Mamish, Nader; Dyer, Jim; Brown, Milton; Greene, Kathryn; Stewart, Sharon; Howard, Patrick; Miller, Charles; Moore, Scott; Cohen, Miriam; Tracy, Glenn; Haney, Catherine; Dorman, Dan; Johnson, Michael; Holahan, Gary; Leeds, Eric; Boger, Bruce; Grobe, Jack; Zimmerman, Roy; Campbell, Andy; Sheron, Brian; Uhle, Jennifer; Dean, Bill; Lew, David; McCree, Victor; Wert, Leonard; Casto, Chuck; Satorius, Mark; Pederson, Cynthia; Collins, Elmo; Howell, Art; Andersen, James; Akstulewicz, Brenda; Belmore, Nancy; Quesenberry, Jeannette; Kreuter, Jane; Armstrong, Janine; Hudson, Sharon; Ellis, Marv; Hasan, Nasreen; Ronewicz, Lynn; Schumann, Stacy; Daniels, Stanley; Casby, Marcia; Thomas, Loretta; Walker, Dwight; Sprogeris, Patricia; Schwarz, Sherry; Ross, Robin; Cohen, Shari; Riddick, Nicole; Flory, Shirley; Veltri, Debra; Matakas, Gina; ODaniell, Cynthia; Miles, Patricia; Lee, Pamela; Dubose, Sheila; Buckley, Patricia; Tomczak, Tammy; Owen, Lucy; Tannenbaum, Anita; Gusack, Barbara; Harrington, Holly; Ricketts, Paul; Howell, Linda; Higginbotham, Tina; Ross, Brenda; Boyce, Thomas (OIS); Schaeffer, James; Jackson, Donald
Cc: Williams, Shawn; Andersen, James; Ramsey, Jack
Subject: Additional Staff requirements outside Ops Center Long Term Staffing
Importance: High

OPA and OIP expect large call volumes today and in the next few weeks given expected news from Japan. OIP is looking for names of people who have desk officer or other OIP or international experience to assist them in the event that current staff cannot meet the work demands for call inquiries as well as ongoing international work. Please provide Shawn Williams and I a list of names that could serve to help OIP in this capacity and their general availability over the next week and month. It is difficult to determine the need level at this time, but as in the Op Center, it is anticipated OIP will have for an additional month. We would like the list of names by COB today.
Thanks
Mary

Mary Muessle
Assistant for Operations - Acting
Office of the Executive Director for Operations
U.S. Nuclear Regulatory Commission
301-415-1703 office
301-415-2700 fax

From: Evans, Michele
Sent: Tuesday, March 15, 2011 5:53 PM
To: Hackett, Edwin; Brenner, Eliot; Schmidt, Rebecca; Powell, Amy; Droggitis, Spiros; Doane, Margaret; Mamish, Nader; Dyer, Jim; Brown, Milton; Greene, Kathryn; Stewart, Sharon; Howard, Patrick; Miller, Charles; Moore, Scott; Cohen, Miriam; Tracy, Glenn; Haney, Catherine; Dorman, Dan; Johnson, Michael; Holahan, Gary; Leeds, Eric; Boger, Bruce; Grobe, Jack; Zimmerman, Roy; Campbell, Andy; Sheron, Brian; Uhle, Jennifer; Dean, Bill; Lew, David; McCree, Victor; Wert, Leonard; Casto, Chuck; Satorius, Mark; Pederson, Cynthia; Collins, Elmo; Howell, Art; Muessle, Mary; Andersen,

James; Akstulewicz, Brenda; Belmore, Nancy; Quesenberry, Jeannette; Kreuter, Jane; Armstrong, Janine; Hudson, Sharon; Ellis, Marv; Hasan, Nasreen; Ronewicz, Lynn; Schumann, Stacy; Daniels, Stanley; Casby, Marcia; Thomas, Loretta; Walker, Dwight; Sprogeris, Patricia; Schwarz, Sherry; Ross, Robin; Cohen, Shari; Riddick, Nicole; Flory, Shirley; Veltri, Debra; Matakas, Gina; ODaniell, Cynthia; Miles, Patricia; Lee, Pamela; Dubose, Sheila; Buckley, Patricia; Tomczak, Tammy; Owen, Lucy; Tannenbaum, Anita; Gusack, Barbara; Harrington, Holly; Ricketts, Paul; Howell, Linda; Higginbotham, Tina; Ross, Brenda; Boyce, Thomas (OIS); Schaeffer, James; Jackson, Donald
Subject: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing

Everyone,

Please find attached 1) a list of current positions being staffed in the Ops Center and 2) the staff identified as available to support in Japan.

Regarding additional staff available to support in the ops center, the primary needs are for the specialized positions on the PMT and anyone with previous international experience in OIP.

Regarding support in Japan, please provide any updates/changes to the list by COB March 17. The target time frame for sending these staff members is March 27-April 9, so please consider that when considering staff to put on the list.

Thanks for your support.

Michele

From: LIA06 Hoc
Sent: Wednesday, March 16, 2011 12:24 PM
To: Cusseaux, Susan; Smith, Bertinia
Subject: can you all please look at the card reader system again?

I still don't have access to the TWFN 4th floor or the Ops Center readers.

Thanks,

Mark Lombard, LT DIrector

PPPP/30

From: LIA06 Hoc
Sent: Wednesday, March 16, 2011 1:10 PM
To: Droggitis, Spiros; Powell, Amy; Schmidt, Rebecca
Subject: interest from our friends on the Hill due to upcoming press release

For you awareness-we think there will be a flood of requests from the Hill staffers when our upcoming press release is issued. Mike Weber is meeting with NMSS, NRR, RES and some others telling them he wants some ODs to be trained as our information ambassadors to help you all support the number of briefings that will probably ensue.

PPPP/31

From: Cherry, Ronald C
To: Brown, Eva
Cc: Trapp, James
Subject: RE: Status Report : Daiichi ~ 3 Hours Old
Date: Wednesday, March 16, 2011 6:22:24 AM

Eva,

Thanks very much. I'll forward this and future updates to the Embassy's Emergency Task Force to go into their sitreps.

Best,

Ron

This email is UNCLASSIFIED.

From: Brown, Eva [mailto:Eva.Brown@nrc.gov]
Sent: Wednesday, March 16, 2011 6:35 PM
To: Cherry, Ronald C
Cc: Trapp, James
Subject: Status Report : Daiichi ~ 3 Hours Old

Ron,

Jim Trapp requested that I provide the following status to you. This information is about 5 hours old and I have included a photo we pulled off the internet of the 4 sites.

This is the status with an update from the IAEA (16 March 0355 GTM):

Daiichi Unit 1
Primary : Intact - Believed RCS Breach
Secondary: Lost
SFP Status: Unknown

Daiichi Unit 2
Primary : Intact- Believed RCS Breach
Secondary: Lost
SFP Status: Unknown

Daiichi Unit 3
Primary : Intact - Believed RCS Breach
Secondary: Lost
SFP Status: Unknown

Daiichi Unit 4
Primary : Intact; core offloaded (~107 days ago)
Secondary: Lost
SFP Status: Fuel reported uncovered

Daiichi Unit 5 (Shutdown January 3, 2011)
Primary : Intact
Secondary: Intact
SFP Status: Increasing temperature (80 degrees C); RPV level down 40 cm in last 5 hours 0700-1200 GMT 3/15. Unit 6 operational diesel being used to provide water to Unit 5 (IAEA 16 March 0355GMT)

PPPP/32

Daiichi Unit 6 (Shutdown August 14, 2010)
Primary : Intact
Secondary: Intact
SFP Status: Increasing temperature (80 degrees C)

Eva Brown, RST BWR Systems and Ops Analyst
Nuclear Regulatory Commission
(301) 816-5516

From: Cherry, Ronald C
To: Brown, Eva
Cc: RST01 Hoc; Trapp, James; Ulses, Anthony
Subject: RE: GE Hitachi Command Center Contact - Rich Rossie
Date: Wednesday, March 16, 2011 5:24:55 AM

Eva,

Will do.

Ron

This email is UNCLASSIFIED.

From: Brown, Eva [mailto:Eva.Brown@nrc.gov]
Sent: Wednesday, March 16, 2011 6:24 PM
To: Cherry, Ronald C
Cc: RST01 Hoc; Trapp, James; Ulses, Anthony
Subject: GE Hitachi Command Center Contact - Rich Rossie

Ron,

Please communicate the following information to Charles Casto, the lead for the NRC response team. The GE Hitachi contact in Tokyo is Rich Rossi, Head Engineering Contact Team, at GEH Command Center [090 3108 2207].

Thanks so much for your cooperation and support.

Eva Brown, Reactor Safety Team - BWR Systems and Ops Analyst
United States Nuclear Regulatory Commission
(301) 816-5516

PPPP/33

From: Amy Sink
To: Cherry, Ronald C
Cc: Trapp, James; Ulses, Anthony; Hughart, Joe
Subject: RE: GE Hitachi Command Center Contact - Rich Rossie
Date: Wednesday, March 16, 2011 7:27:58 AM

Hi Ron,

The NRC came in with their own blackberries. I believe they provided a list of numbers to Joe Hughart on our team, so I am copying him on your request.

Thanks,
Amy

From: Cherry, Ronald C [mailto:CherryRC@state.gov]
Sent: Wed 3/16/2011 6:19 AM
To: Amy Sink
Cc: Trapp, James; Ulses, Anthony
Subject: FW: GE Hitachi Command Center Contact - Rich Rossie

Amy,

Can I get contact information for the NRC team if you have that?

Thanks very much.

Ron

This email is UNCLASSIFIED.

From: Brown, Eva [mailto:Eva.Brown@nrc.gov]
Sent: Wednesday, March 16, 2011 6:24 PM
To: Cherry, Ronald C
Cc: RST01 Hoc; Trapp, James; Ulses, Anthony
Subject: GE Hitachi Command Center Contact - Rich Rossie

Ron,

PPPP|34

Please communicate the following information to Charles Casto, the lead for the NRC response team. The GE Hitachi contact in Tokyo is Rich Rossi, Head Engineering Contact Team, at GEH Command Center [090 3108 2207].

Thanks so much for your cooperation and support.

Eva Brown, Reactor Safety Team - BWR Systems and Ops Analyst

United States Nuclear Regulatory Commission

(301) 816-5516

From: Brown, Eva
To: Trapp, James; Ulses, Anthony
Subject: Status as of 15:59 JPT
Date: Wednesday, March 16, 2011 2:59:46 AM

Jim/Tony,

This is the status with an update from the IAEA:

Daiichi Unit 1
Primary : Intact - Believed RCS Breach
Secondary: Lost
SFP Status: Unknown

Daiichi Unit 2
Primary : Intact- Believed RCS Breach
Secondary: Lost
SFP Status: Unknown

Daiichi Unit 3
Primary : Intact - Believed RCS Breach
Secondary: Lost
SFP Status: Unknown

Daiichi Unit 4
Primary : Intact; core offloaded (~107 days ago)
Secondary: Lost
SFP Status: Fuel reported uncovered

Daiichi Unit 5 (Shutdown January 3, 2011)
Primary : Intact
Secondary: Intact
SFP Status: Increasing temperature (80 degrees C); RPV level down 40 cm in last 5 hours 0700-1200 GMT 3/15. Unit 6 operational diesel being used to provide water to Unit 5 (IAEA 16 March 0355GMT)

Daiichi Unit 6 (Shutdown August 14, 2010)
Primary : Intact
Secondary: Intact
SFP Status: Increasing temperature (80 degrees C)

Eva Brown, RST BWR Systems and Ops Analyst
Nuclear Regulatory Commission
(301) 816-5516

PPPP/35

From:	Brenner, Eliot
To:	Hayden, Elizabeth; Burnell, Scott; Harrington, Holly; McIntyre, David; Couret, Ivonne; Shannon, Valerie; Janbergs, Holly; Akstulewicz, Brenda; Wittick, Susan; Royer, Deanna; Bonaccorso, Amy; Deavers, Ron; Tobin, Jennifer; Taylor, Robert; Steger (Tucci), Christine; Ghneim, Munira; Widomski, Michael
Subject:	kudos to all
Date:	Thursday, March 17, 2011 10:04:26 PM

Four hours ago, the chairman called me to tell me to go home and get some rest. So, here I sit in a hotel room finishing up my emails and listening to some guy from Burson-Marstetler hustle me for business. I finally told him I had to get off the line because I had something important to do. (he made some good points that perhaps we can use going forward, but I don't think I'll hire him.)

What I had to do was tell you what the chairman also said to me. He told me that he thought Public Affairs was doing a great job in dealing with all the issues being thrown at us. I always agree with the chairman, well most of the time, and this happens to be one of them.

Not only have OPAers pitched in with long days and long nights, others in the agency have now come to our aid and it is making our collective job much easier. In fact, we are now bringing in some additional help and I suspect when all the paperwork is done you may recognize at least one of the names.

I am so honored to be working with such a bunch of professionals. I can go out with the chairman on his many rounds and know without fail that the job is getting done.

As reporters, many of us had front row seats at history. Today, we are part of making history and it is a time we will never forget. The days will continue to be long, but hopefully we can start giving folks some time off. One thing to remember: This is a marathon, not a sprint. (Yeah, how many times have you hard that metaphore used?) Pace yourself. Take time to go outside and enjoy the spring, feel the sun on your face, and come back knowing you are doing a damn fine job.

I thank you.

Eliot

DRPP/36

From: CDMC
To: Trapp, James
Subject: Praying for Japanese Disaster-China Nuclear Energy Congress 2011
Date: Thursday, March 17, 2011 6:00:32 AM

Current Status of Fukushima Daiichi NPPs

Unit	Status
1	Reactor cold shutdown, stable water level, offsite power is available o refrigerant is leaked in the reactor contaminant vessel Maintain average water temperature at 100 in the pressure restraint
2	Reactor cold shutdown, stable water level, offsite power is available No refrigerant is leaked in the reactor contaminant vessel Maintain average water temperature at 100 in the pressure restraint
3	Reactor cold shutdown, stable water level, offsite power is available No refrigerant is leaked in the reactor contaminant vessel Maintain average water temperature at 100 in the pressure restraint
4	Reactor cold shutdown, stable water level, offsite power is available No refrigerant is leaked in the reactor contaminant vessel Maintain average water temperature at 100 in the pressure restraint

From TEPCO Press Release 13:00 PM Mar. 15

All units at the Fukushima II Daini, Onagawa, and Tokai nuclear power plants are in a safe and stable condition.

Japan's top government spokesperson says the radiation level at the quake-hit nuclear power plant in Fukushima Prefecture, north of Tokyo, rose briefly on Wednesday morning.

The fuel rod exposure at Fukushima Daiichi number 2 reactor is potentially the most serious event so far at the plant.

At this moment, what we can do is just praying for Japanese disaster.

Given the apparent severity of the events at Fukushima, the organizing committee decides to set up some sort of special session(s) at Beijing to help share the initial lessons learned.

Related Speakers:

- LIU Hua, Director, National Nuclear Safety Administration(NNSA)
- Chris Lanzit, Senior Advisor on China, American Society of Mechanical Engineers (ASME)

PPPP 137

• IAEA's speakers are invited by the organizing committee to give our audience a full scene of what happened in FUKUSHIMA.

Join China Nuclear Energy Congress 2011

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Agenda at a glance:

	Day one (May 12)	Day two (May 13)
Morning	S1. Outlook of Nuclear Market S2. Reactor Debate	S4. Bottleneck: Safety and Uranium Uranium Mining Companies focus
Afternoon	S3. Dialogue Between Operators Equipment supplies highly suggested	S5. Reviewing Other Asia Nuclear Energy Users

Exhibit at CNEC 2011 and meet with:

- Policy Makers
- China Nuclear Troika
- Domestic EPC Contractor
- Chinese Uranium Traders
- Large equipment providers
- Utilities

If you are interested in sponsorship, exhibit & speaking opportunities, please contact us at cnec@cdmc.org.cn

Please, do not hesitate to contact us with any questions that you may have, and we look forward to welcoming you at the event!

Sincerely,

Michael LIU
Porject Director
China Nuclear Energy Congress 2011
T: +8621-6840-7631
E:michaell@cdmc.org.cn

--> **Register to attend China Nuclear Energy Congress 2011**

Dean, Bill

From: Dean, Bill
Sent: Thursday, March 17, 2011 4:02 PM
To: Lew, David
Subject: Re: 50 mile Q&A

Man, I woulda thought they would have that nailed already
Bill Dean
Regional Administrator
Region I, USNRC
Sent from NRC BlackBerry

From: Lew, David
To: Evans, Michele; Moore, Scott; Nelson, Robert
Cc: Dean, Bill; Screnci, Diane; Roberts, Darrell; Wilson, Peter
Sent: Thu Mar 17 15:32:54 2011
Subject: 50 mile Q&A

I just wanted you to be aware of an ongoing challenge to ensure appropriate attention and priority is being applied. Many of State stakeholders are pressing us on questions regarding the 50 mile press release, and implications relative to the 10 mile EPZ. I believe that it is very important for us to develop a response to the question in a timely manner to maintain credibility.

If I may suggest, can we articulate the Protective Measures Team thought process and then fully vet that through the appropriate levels within the agency. Not knowing what the PMT considerations were, I can see a number of unique elements which may have driven the decision, including:

- There is no direct correlation between the NRC 50 mile press release and the 10 mile EPZ.
- We are advising US citizens located in a sovereign country for which we have no authority and no ability to communicate with our citizens in a systematic method.
- As many countries do, we provide precautionary recommendations to our citizens.
- Because the NRC has no authority nor infrastructure in another country, the recommendation was highly conservative and factored in the lack of other information which would normally be available to decision-makers if the situation were here in the United States. We would have real time surveys and radiological and meteorological data, real time data on plant conditions and an infrastructure that includes communications with our citizens.
- Other reasons?

Dave

PPPP/36

From: LIA04 Hoc
Sent: Thursday, March 17, 2011 8:28 PM
To: LIA06 Hoc
Subject: 10 mile zone vs. 50 mile in Japan

- The 10-mile EPZ reflects the area where projected doses from design basis accidents at nuclear power plants would not exceed the EPA's protective action guidelines, and we are confident that it would be adequate even for severe accidents. However, the 10-mile zone was always considered a base for emergency response that could be expanded if the situation warranted. The situation in Japan, with four reactors experiencing exceptional difficulties simultaneously, creates the need to expand the EPZ beyond the normal 10-mile radius.

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

PPPP/39

From: LIA08 Hoc
Sent: Thursday, March 17, 2011 5:59 PM
To: LIA01 Hoc
Cc: LIA06 Hoc
Subject: RE: Welcome to the SharePoint group: SOC Portal Members for site: Home

Jerry, please keep Mark and me apprised of progress in obtaining access to the SOC Portal.
Thanks,
Rani

From: LIA01 Hoc
Sent: Thursday, March 17, 2011 5:47 PM
To: LIA08 Hoc
Subject: FW: Welcome to the SharePoint group: SOC Portal Members for site: Home

---

From: socportal.os@hhs.gov [mailto:socportal.os@hhs.gov]
Sent: Thursday, March 17, 2011 3:47 PM
To: LIA01 Hoc
Subject: Welcome to the SharePoint group: SOC Portal Members for site: Home

Welcome to the 'SOC Portal Members' SharePoint group. Smith, Kathy (HHS/OS) (HHS\kathy.smith) has added you to the 'SOC Portal Members' group for this SharePoint site.
Group description: Use this group to give people contribute permissions to the SharePoint site: SOC Portal

As a member of this SharePoint group, you can:

* Participate in the SharePoint site at: https://socportal.hhs.gov
* View the group home page at: https://socportal.hhs.gov/_layouts/people.aspx?MembershipGroupId=7

What is a SharePoint site?

A SharePoint site is a Web site that provides a central storage and collaboration space for documents, information, and ideas. A SharePoint site is a tool for collaboration, just like a telephone is a tool for communication, or a meeting is a tool for decision making. A SharePoint site helps groups of people (whether work teams or social groups) share information and work together. For example, a SharePoint site can help you:

* Coordinate projects, calendars, and schedules.
* Discuss ideas and review documents or proposals.
* Share information and keep in touch with other people.

SharePoint sites are dynamic and interactive -- members of the site can contribute their own ideas and content as well as comment on or contribute to other people's.

PPPP|40

From: Anderson, Joseph
Sent: Thursday, March 17, 2011 5:25 PM
To: LIA06 Hoc; Thaggard, Mark; Kahler, Robert; Williams, Kevin
Cc: LIA11 Hoc; Wright, Lisa (Gibney)
Subject: FEEDBACK: EPZ Descriptions

My thoughts on on write up are highlighted below. I would suggest stepping back and looking at write up from general publics perspective; I believe this is still written to EP specialist level. Have a member of admin. staff review it and ask her/him to explain.

I would also STRONGLY recommend getting this to RSLOs for a look and to provide input, since they are our first-line interface with State/locals.

Emergency Planning Zones

EPZs in Brief

Radiological Emergency Preparedness Program (REPP) planning guidance provides for two emergency planning zones (EPZs) for U.S. commercial nuclear power plants (NPPs):

- **Plume** Exposure Pathway Emergency Planning Zone (apx. 10 Miles in radius)
    - Designed to safeguard the population most at risk from **direct exposure** to dangerous levels of radiation.
- **Ingestion** Exposure Pathway Emergency Planning Zone (apx. 50 Miles in radius)
    - Designed to protect the public from **secondary exposure** to radiation through the food chain or public water supplies

The planning zones are intended to be scalable over time to account for changing conditions that could possibly put the public outside the initial planning zones at risk.

Specifically, NUREG-0654/FEMA-REP-1 states: "In a particular emergency, protective actions might well be restricted to a small part of the planning zone. On the other hand, for the worst possible accidents, protective actions would need to be taken outside the planning zones" (I.D., p.11) **i.e., the EPZs are the base areas requiring emergency planning – they are designed to be expanded [The terms "intended" and "designed" to me infers so prior planning and that somehow we may expect that they will be exceed for a worst case event. Need to revise or explain what this "design" is referring to, rather than adhoc. Remember that public reading this may infer that the NRC knew all along that EPZ size was inadequate for worst case event.] (beyond the base of 10, 50 miles), as necessary, during emergencies.**

Note: The 10 & 50 mile EPZs are the Federally required minimum. Our regulations state that the exact size and shape of the EPZs shall be determined by the STATE and LOCAL governments – in consultation with FEMA and the NRC (44 CFR § 350.7).

PPPP | 41

EPZ Evacuations

FEMA affirms that evacuation of the public is the preferred initial protective action in the event of a severe (core damage) emergency occurring (or likely to occur) at NPPs. Federal requirements for NPPs include the establishment of EPZs at 10 and 50-mile distances surrounding the site that detail evacuation routes. Evacuation planning includes the development and incorporation of periodic evacuation time estimate studies to ensure that prompt and effective actions can be taken by offsite response organizations to protect the public in the event of a radiological emergency. This includes accounting for both permanent and transient populations, persons with disabilities and access/functional needs, those whose mobility may be impaired because of institutional or other confinement as well as provisions for the monitoring, decontamination and congregate care of evacuees, as necessary.

Where immediate evacuation of an affected population within the EPZ is not practical due to impediments (e.g., debris blocking evacuation routes, severe weather, etc.) or where evacuation could pose a greater potential health risk, temporary sheltering-in-place of the public is the preferred protective action. State, Tribal and local evacuation plans and procedures for NPP communities are reviewed and approved by FEMA. While actual evacuations of the public are not required in biennial FEMA evaluations, appropriate demonstrations by State, Tribal and local response agencies to direct and control a public evacuation is assessed.

EPZs in Detail

The Emergency Planning Zone (EPZ) is the area surrounding an commercial nuclear power plant (NPP) for which plans/procedures have been made to ensure that prompt and effective actions are taken to protect the health and safety of the public in case of an incident at the NPP. **The NRC and** FEMA recognize two types of EPZs for planning purposes: the plume exposure pathway EPZ and the ingestion exposure pathway EPZ. The characteristics of these two types of EPZs are summarized in Exhibit I. Each EPZ is a roughly circular area **[Very few EPZs, if any, are circular. I would recommend using words from NUREG-0654 that talks about how actual boundaries are determine - geographically identifiable, e.g. major roads, city/town borders, etc.]**, with the NPP at the center.

The EPZs sizes represent a technical judgment based on the type and quantity of hazardous materials present (source term) and the potential risks where detailed planning is needed to ensure adequate response to an emergency. An EPZ may include more than one State. "Split" jurisdictions (i.e., part of the jurisdiction is included in the EPZ and part is not) also exist. In these cases, EPZ boundaries are determined based on consultation with all parties involved, including OROs, FEMA, and the NRC. In some cases, a conservative option is taken and the entire jurisdiction is included in the EPZ.

Exhibit I: Plume and Ingestion EPZ Characteristics

Type of EPZ	Exposure Sources	Size
Plume Exposure Pathway	• Whole-body external exposure to gamma radiation from the passing plume and from deposited material • Thyroid exposure through inhalation from the passing plume • Committed effective dose equivalent exposure to other critical organs through inhalation	Approximately 10-mile radius
Ingestion Exposure Pathway	• Ingestion of contaminated water or foods, such as milk, fresh vegetables, and aquatic foodstuffs, may result in increased risk of radiation-induced cancer to the thyroid, bone marrow, and other organs	Approximately 50-mile radius

The size of the **plume exposure pathway** EPZ, about 10 miles in radius, is based on the following considerations from NUREG-0654/FEMA-REP-1:

- Projected doses from traditional design-basis accidents/incidents would not exceed the PAG levels outside the zone;

- Projected doses from most core damage sequences **[What do you mean by "most?" Need to take this to laymen's terms so general public will understand.]** would not exceed PAG levels outside the zone;
- For the worst-case **[need to better define, specifically in terms of "immediate life-threatening." Must address question, "Why wouldn't current Japanese event meet this criteria?"]** core damage sequences, immediate life-threatening doses would generally not occur outside the zone; and
- **Detailed planning within approximately 10 miles would provide a substantial base for expansion of response efforts to a larger area, if necessary.**

The size of the **ingestion exposure pathway** EPZ, about 50 miles in radius, including the 10-mile radius plume exposure pathway EPZ, is based on the following considerations:

- The downwind range within which contamination may potentially exceed the PAGs is limited to about 50 miles from an NPP because of wind shifts during the release and travel periods;
- Atmospheric iodine (i.e., iodine suspended in the atmosphere for long periods) may be converted to chemical forms that do not readily enter the ingestion pathway; and
- Much of the particulate material in a radioactive plume would have been deposited on the ground within about 50 miles from the NPP.

The likelihood of exceeding ingestion exposure pathway Protective Action Guide levels at 50 miles is comparable to the likelihood of exceeding plume exposure pathway PAG levels at 10 miles.

From: LIA08 Hoc
Sent: Thursday, March 17, 2011 6:24 PM
To: Lombard, Mark; Adams, John
Cc: Reed, Elizabeth; LIA06 Hoc; LIA01 Hoc
Subject: SOC Portal Access has been provided
Attachments: FW: Welcome to the SharePoint group: SOC Portal Members for site: Home; FW: SOC Portal Access

Mark and John,
Beth indicated at the end of her shift that John had asked her to follow-up with HHS to gain access to their SOC portal. The attached two emails are in response to that action. Looks like we have obtained access, but Mark T and I cannot figure out where the request for this came from and for what purpose.
Can you guys fill us in on that so we can add it to the log?
Thanks,
Rani

PPPP/42

From: LIA08 Hoc
Sent: Thursday, March 17, 2011 8:30 PM
To: Deavers, Ron
Cc: LIA02 Hoc; LIA06 Hoc; Burnell, Scott; Fehst, Geraldine; Stahl, Eric
Subject: RE: hydrogen leakage measurement inquires from Mexico

Hi Ron,
I do not believe the IRC staff should be responding to this request from an member of the Mexican nuclear power industry. Suggest OIP handle this through non-emergency channels. Sound okay to you?
Rani Franovich
Liaison Team Coordinator

-----Original Message-----
From: LIA02 Hoc
Sent: Thursday, March 17, 2011 8:20 PM
To: LIA08 Hoc
Subject: FW: hydrogen leakage measurement inquires from Mexico

-----Original Message-----
From: Deavers, Ron
Sent: Thursday, March 17, 2011 7:26 PM
To: LIA02 Hoc
Cc: Bonaccorso, Amy; Tobin, Jennifer; Ridge, Christianne; Deavers, Ron
Subject: FW: hydrogen leakage measurement inquires from Mexico

Forward foreign info request ...

-----Original Message-----
From: OPA Resource
Sent: Thursday, March 17, 2011 6:19 PM
To: Deavers, Ron; Bonaccorso, Amy
Subject: FW: hydrogen leakage measurement inquires from Mexico

-----Original Message-----
From: PDR Resource
Sent: Thursday, March 17, 2011 5:49 PM
To: OPA Resource
Subject: hydrogen leakage measurement inquires from Mexico

This requester in Mexico sent their questions to the web team overnight. The web team forwarded them to us.

Are these questions something we should answer, or should OIP respond? If so, I don't know have a general e-mail address for OIP.

PPPP/43

Thanks,
Karen
PDR
415-4737

-----Original Message-----
From: NRCWEB Resource
Sent: Thursday, March 17, 2011 3:00 AM
To: PDR Resource
Subject: FW: Response from "Contact the NRC Web Site Staff"

-----Original Message-----
From: Francisco Tijerina [mailto:francisco.tijerina@cfe.gob.mx]
Sent: Thursday, March 17, 2011 2:46 AM
To: NRCWEB Resource
Subject: Response from "Contact the NRC Web Site Staff"

Below is the result of your feedback form. It was submitted by

Francisco Tijerina (francisco.tijerina@cfe.gob.mx) on Thursday, March 17, 2011 at 02:46:06
---

comments: could you send me pleasse the next informaton:
1) I need information (NUREG, GUIDE REGULATORY, GENERIC LETER,ETC) connected with "hydrogen leakage measurement" in building areas of RFW by used the injection of hydrogen into Reactor Feed Water system to mitigate failure in material internal of reactor.
2) which are nuclear plants in EEUU, that use technology romote for measure hydrogen leakage in RFW?
3) which is the technology of measure hydrogen leakage approved by NRC (Topical Report)?

Thanks by your technical support

Best ragards

Francisco Tijerina
Laguna Verde Nuclear Plant
francisco.tijerina@cfe.gob.mx

organization: LAGUNA VERDE NUCLEAR PLANT

address1: LAGUNA VERDE NUCLEAR PLANT

address2:

city: VERACRUZ

state: ---

zip:

country: MEXICO

phone: 522299899090

From: OST05 Hoc
Sent: Thursday, March 17, 2011 2:03 PM
To: LIA06 Hoc; LIA08 Hoc; LIA04 Hoc; OST05 Hoc; LIA09 Hoc; LIA05 Hoc; LIA01 Hoc; LIA11 Hoc; LIA12.HOC@nrc.gov; LIA03 Hoc; LIA02 Hoc; LIA10 Hoc
Subject: FYI: Liaison Team Computer Assignments
Attachments: Liaison Team Computer Assignments.docx

In case you need to forward something to another team member, attached are the computer assignments around the Liaison Team room.

Alison Rivera
State Liaison – Liaison Team
Incident Response Center

PPPP/44

Liaison Team Computer Assignments for Japanese Response

Computer Name	Assigned Desk
LIA06	LT Director
LIA08	LT Coordinator
LIA04	State Liaison Desk 1
OST05	State Liaison Desk 2
LIA09	LT Technical Advisor
LIA05	FEMA Liaison to the NRC
LIA01	Federal Liaison Desk 1
LIA11	Federal Liaison Desk 2
LIA12	Congressional Liaison Desk
LIA03	International Liaison Desk 1
LIA02	International Liaison Desk 2
LIA10	International Liaison Desk 3 (Interpreter)

From:	LIA04 Hoc
Sent:	Thursday, March 17, 2011 1:22 PM
To:	Nguyen, Quynh; Meighan, Sean
Cc:	OST05 Hoc; LIA06 Hoc; LIA08 Hoc; LIA01 Hoc; LIA11 Hoc; LIA12 Hoc; LIA01 Hoc; Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; Maier, Bill; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena
Subject:	FW: Worst Case Scenario.

See Q below. As Bill indicates, NRC and DOE/NARAC are closely coordinating on this – stay tuned

---

From: Maier, Bill
Sent: Thursday, March 17, 2011 12:35 PM
To: Lee Shin
Cc: LIA04 Hoc; OST05 Hoc; Howell, Linda
Subject: RE: Worst Case Scenario.

Lee,

I understand you have made the same request to NARAC. NRC headquarters is coordinating with DOE (NARAC) on a response.

Bill Maier

From: Lee Shin [mailto:Lee.Shin@calema.ca.gov]
Sent: Wednesday, March 16, 2011 8:43 PM
To: Maier, Bill
Cc: Howell, Linda
Subject: Worst Case Scenario.

Bill, I would like to see if you could assist in providing for us a "worst case scenario" and how it might affect the United States. If there is that potential, how would we modify our message to the public and local stakeholders?

Lee Shin
Manager, Radiological Preparedness Unit
California Emergency Management Agency
3650 Schriever Avenue
Mather, CA 95655

916-996-6340

PPPP/45

From: Lee Shin <Lee.Shin@calema.ca.gov>
Sent: Thursday, March 17, 2011 12:45 PM
To: Maier, Bill
Cc: LIA04 Hoc; OST05 Hoc; Howell, Linda
Subject: RE: Worst Case Scenario.

Bill, never made any request to anyone outside of the one to you specifically. Who at NARAC told you that. I have not spoken to anyone at NARAC or DOE regarding "worst case". Lee

---

From: Maier, Bill [mailto:Bill.Maier@nrc.gov]
Sent: Thursday, March 17, 2011 9:35 AM
To: Lee Shin
Cc: LIA04 Hoc; OST05 Hoc; Howell, Linda
Subject: RE: Worst Case Scenario.

Lee,

I understand you have made the same request to NARAC. NRC headquarters is coordinating with DOE (NARAC) on a response.

Bill Maier

From: Lee Shin [mailto:Lee.Shin@calema.ca.gov]
Sent: Wednesday, March 16, 2011 8:43 PM
To: Maier, Bill
Cc: Howell, Linda
Subject: Worst Case Scenario.

Bill, I would like to see if you could assist in providing for us a "worst case scenario" and how it might affect the United States. If there is that potential, how would we modify our message to the public and local stakeholders?

Lee Shin
Manager, Radiological Preparedness Unit
California Emergency Management Agency
3650 Schriever Avenue
Mather, CA 95655

916-996-6340

PPPP/46

From: LIA06 Hoc
Sent: Thursday, March 17, 2011 7:42 PM
To: RST01 Hoc; RST02 Hoc
Subject: Information from the Japan Atomic Industrial Forum

FYI – See the link below on information posted by the JAIF. Our International folks say their information is generally reliable.
http://www.jaif.or.jp/english/news_images/pdf/ENGNEWS01_1300368607P.pdf

Mark Thaggard
Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

PPPP/47

From: Franovich, Rani
Sent: Thursday, March 17, 2011 1:26 PM
To: LIA08 Hoc; LIA06 Hoc
Subject: FW: Latest report from UCS

Just FYI...

From: Franovich, Rani
Sent: Thursday, March 17, 2011 1:23 PM
To: Brown, Frederick; Westreich, Barry; Kobetz, Timothy; Thorp, John; Shoop, Undine; Elliott, Robert; McHale, John
Subject: Latest report from UCS

FYI...
I just received a call from Tom Houghton... he indicated there was a press release at 11:00 this morning on a report UCS issued either yesterday or today. I have not yet read the report or the press release, but wanted to get the link out to you guys...

http://www.ucsusa.org/nuclear_power/nuclear_power_risk/safety/nrc-and-nuclear-power-2010.html

PPPP/48

From: McGinty, Tim
Sent: Thursday, March 17, 2011 12:50 PM
To: LIA08 Hoc
Cc: LIA06 Hoc
Subject: RE: Latest LT Director Watchbill

How is our watchbill looking? Do we have confirmation from all of the new folks for taking on weekend shifts this weekend? Tim

---

From: LIA08 Hoc
Sent: Wednesday, March 16, 2011 5:14 PM
To: McGinty, Tim; Lombard, Mark; Thaggard, Mark; Tschiltz, Michael; Blount, Tom
Subject: Latest LT Director Watchbill
Importance: High

PPPP/49

From: RST01 Hoc
Sent: Thursday, March 17, 2011 12:23 PM
To: LIA06 Hoc
Subject: FW: Embassy Nuclear Energy Team - email distribution list
Attachments: Embassy Nuclear Energy Team

Please include all updates to Berger, Claire

From: Devercelly, Richard
Sent: Thursday, March 17, 2011 12:14 PM
To: RST01 Hoc
Subject: FW: Embassy Nuclear Energy Team - email distribution list

Please follow the instructions below to add our entire group to your E-mail contacts group then followup with including us in the Periodic Update distributions.

Please reply to confirm receipt.

From: Berger, Claire [BergerMC@state.gov]
Sent: Thursday, March 17, 2011 11:10 AM
To: JapanEmbassy, TaskForce; Alan Remick DOE; Aleshia Duncan; Amy Sink OFDA; Cook, William; Smith, Brooke; Cherry, Ronald C; Casto, Chuck; Damian Peko; Duncan, Aleshia D; Howard, E. Bruce; Foster, Jack; Trapp, James; James Trapp NRC; Joe Hughart HHS; Joe Hughart OFDA; Monninger, John; Foggie, Kirk; Mears, Jeremy M; Morales, Russell A; Nesheiwat, Julia; Devercelly, Richard; Russ Morales; Tamada, Yoshimi; Kolb, Timothy; Nakanishi, Tony; Ulses, Anthony; Uchida, Koichi
Subject: FW: Embassy Nuclear Energy Team - email distribution list

Please drag the icon into your own contacts list.
Thank you.

Claire Berger

This email is UNCLASSIFIED.

PPPP/50

From: LIA05 Hoc
Sent: Thursday, March 17, 2011 6:49 PM
To: Andrew Seward; Harry Sherwood; Michelle Ralston; Steve Horwitz; Tim Greten; Vanessa E. Quinn
Cc: Albert Coons; Bill Webb; Conrad Burnside; Craig Fiore; Dan Feighert; Darrell Hammons; Lisa Hammond; Rebecca Thomson; Ronald McCabe; Steve Colman; William King
Subject: FW: Tonight's call with DOE

Importance: High

FYI,

This is the official transmission.

FEMA REP Liaison
NRC Operations Center
(301) 816-5187

~~*****FOR OFFICIAL USE ONLY*****~~
~~DO NOT RELEASE OUTSIDE OF THE FEDERAL FAMILY~~

From: LIA04 Hoc
Sent: Thursday, March 17, 2011 6:47 PM
To: Piccone, Josephine; Jackson, Deborah; OST05 Hoc; LIA06 Hoc; LIA05 Hoc; LIA01 Hoc; LIA11 Hoc; Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; Maier, Bill; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena; Flannery, Cindy; LIA04 Hoc; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michelle; Turtil, Richard; Virgilio, Rosetta; Collins, Elmo; Dean, Bill; Heck, Jared; McCree, Victor; Pederson, Cynthia; Satorius, Mark
Subject: Tonight's call with DOE

We have learned that tonight's 19:00 call with DOE with the States is in fact:

A meeting organized by the White House (NSS - National Security Staff) for Western Governors and Territories.

The following agenda was communicated by a DOE individual (A.J. Gibson):

1st. Coordinated Strategic Call – 19:00 EDT (Governors are being contacted by the White House)

1) Introductions
2) Briefing Update – Intergovernmental Agencies
3) Reactor Situation in Japan – DOE
4) Humanitarian/Effects on U.S. Citizens – State Department
5) Discussion of Monitoring – U.S. EPA
6) Potential Health Effects - HHS
7) Open Discussion – Intergovernmental Agencies
8) Summary - All

NRC will be a party to this call, but we are not expected to speak.

PPPP/51

Richard Turtil
State Liaison – Liaison Team
Incident Response Center

From: Logaras, Harral
Sent: Thursday, March 17, 2011 9:20 PM
To: LIA04 Hoc
Subject: Re: Tonight's call with DOE

Rich, thank you for the info

From: LIA04 Hoc
To: Piccone, Josephine; Jackson, Deborah; OST05 Hoc; LIA06 Hoc; LIA05 Hoc; LIA01 Hoc; LIA11 Hoc; Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; Maier, Bill; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena; Flannery, Cindy; LIA04 Hoc; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michelle; Turtil, Richard; Virgilio, Rosetta; Collins, Elmo; Dean, Bill; Heck, Jared; McCree, Victor; Pederson, Cynthia; Satorius, Mark
Sent: Thu Mar 17 18:46:57 2011
Subject: Tonight's call with DOE

We have learned that tonight's 19:00 call with DOE with the States is in fact:

A meeting organized by the White House (NSS - National Security Staff) for Western Governors and Territories.

The following agenda was communicated by a DOE individual (A.J. Gibson):

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5) Discussion of Monitoring – U.S. EPA
6) Potential Health Effects - HHS
7) Open Discussion – Intergovernmental Agencies
8) Summary - All

NRC will be a party to this call, but we are not expected to speak.

Richard Turtil
State Liaison – Liaison Team
Incident Response Center

PPPP/52

From: Piccone, Josephine
Sent: Thursday, March 17, 2011 6:52 PM
To: LIA04 Hoc
Subject: Re: Tonight's call with DOE

Please call

From: LIA04 Hoc
To: Piccone, Josephine; Jackson, Deborah; OST05 Hoc; LIA06 Hoc; LIA05 Hoc; LIA01 Hoc; LIA11 Hoc; Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; Maier, Bill; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena; Flannery, Cindy; LIA04 Hoc; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michelle; Turtil, Richard; Virgilio, Rosetta; Collins, Elmo; Dean, Bill; Heck, Jared; McCree, Victor; Pederson, Cynthia; Satorius, Mark
Sent: Thu Mar 17 18:46:57 2011
Subject: Tonight's call with DOE

We have learned that tonight's 19:00 call with DOE with the States is in fact:

A meeting organized by the White House (NSS - National Security Staff) for Western Governors and Territories.

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1st. Coordinated Strategic Call – 19:00 EDT (Governors are being contacted by the White House)

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5) Discussion of Monitoring – U.S. EPA
6) Potential Health Effects - HHS
7) Open Discussion – Intergovernmental Agencies
8) Summary - All

NRC will be a party to this call, but we are not expected to speak.

Richard Turtil
State Liaison – Liaison Team
Incident Response Center

PPPP/53

From: LIA04 Hoc
Sent: Thursday, March 17, 2011 8:27 PM
To: LIA06 Hoc
Subject: FW: Helped needed regarding NRC statement

From: Maier, Bill
Sent: Thursday, March 17, 2011 5:59 PM
To: kvanburen@co.slo.ca.us
Subject: FW: Helped needed regarding NRC statement

Kelly,

Your question has been echoed from various offsite agencies across the nation. We are trying to get an answer that you will find acceptable and useable. I got one from our public affairs folks that you would not appreciate. Still working.

Bill

From: kvanburen@co.slo.ca.us [mailto:kvanburen@co.slo.ca.us]
Sent: Thursday, March 17, 2011 10:32 AM
To: Maier, Bill
Subject: Helped needed regarding NRC statement

Hi Bill,

I am sure you are absolutely swamped at the moment, but we are really going to need some help with this latest information recommended by the NRC. We are receiving many calls regarding why we plan just for the Emergency Planning Zone, if the NRC is saying 50 miles in Japan.

Any guidance or talking points you have would be most helpful!

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

Thanks Bill!

Kelly Van Buren
Emergency Services Coordinator
Office of Emergency Services
County Government Center, Rm D430
San Luis Obispo, CA 93408
Ph (805) 781-1955 - Fax (805) 781-5005
www.slocounty.ca.gov/OES

PPPP/54

[Scanned @co.slo.ca.us]

Dean, Bill

From: Dean, Bill
Sent: Friday, March 18, 2011 8:09 PM
To: McNamara, Nancy
Subject: Re: NRC's Blog Posting Re: MSNBC Article

Thanks. It is pretty good plain english.
Bill Dean
Regional Administrator
Region I, USNRC
Sent from NRC BlackBerry

From: McNamara, Nancy
To: Lew, David; Dean, Bill; Schmidt, Wayne; Roberts, Darrell; Wilson, Peter; Weerakkody, Sunil; Gray, Mel
Sent: Fri Mar 18 15:54:35 2011
Subject: NRC's Blog Posting Re: MSNBC Article

I forwarded to our Stakeholders, particularly, NY, the following NRC blog posting:

"Many news reports during this chaotic week have questioned the safety of U.S. nuclear power plants in the wake of the terrible events in Japan. These reports raise questions about the design of reactor containments and spent fuel pools, and of course whether our plants would be able to withstand an earthquake and tsunami like the ones that devastated Japan.

Nuclear power is a complicated, technical subject, and we naturally try to simplify it to make it understandable to the general public. Sometimes, however, simplification leads to misunderstanding, and misunderstanding causes fear.

One example was a so-called "investigative report" on MSNBC.com that ranked nuclear power plants according to their "vulnerability" to major earthquakes. The reporter concluded that the Indian Point plant, 24 miles north of New York City, was "the most vulnerable" in the nation. Instant headlines. You may have heard a local news report that your neighborhood nuclear plant ranked "on the NRC's Top Ten List" of the plants most likely to tumble in a temblor.

Let's be clear: The NRC does not rank nuclear power plants according to their vulnerability to earthquakes. This "ranking" was developed by the MSNBC.com reporter using partial information and we believe an even more partial understanding of how we evaluate plants for seismic risk. Each plant is evaluated individually according to the geology of its site, not by a "one-size-fits-all" model – therefore such rankings or comparisons are highly misleading.

We are also frequently asked whether Plant A can withstand a quake of magnitude X. The reporters always want a yes-or-no answer, but again, it's not that simple. Nuclear plants are designed to withstand a certain level of "ground shaking," to use a technical term. But the way the ground shakes in an earthquake is a factor of the magnitude and the distance from the epicenter, among other things. So we can't give a simple answer to such a simple question.

Each plant is built to the circumstances that exist at its location – including earthquakes, floods and tsunamis. For example, at nuclear plants along the Atlantic and Gulf Coasts, the greatest water threat is hurricane storm surge, not a tsunami. Moreover, there is only one fault, near the northwest U.S. coast, that is similar to the fault in Japan, and there are no nuclear plants nearby. The closest coastal plant to that fault is well-protected against tsunami.

Over the last few years, the NRC has reassessed nuclear plants in the central and eastern United States for their vulnerability to earthquakes, using new seismic data developed by geologists. The study's preliminary work has shown that a few plants might have stronger ground motions than originally thought, although still within the plants' safety margins. These plants will do more research once more detailed analytical models are available later this year.

This is a complex issue that does not always lend itself to simple yes and no answers. Bottom line: the NRC does not rank plants on seismic risk. Plants in this country continue to operate safely and securely."

Eliot Brenner
Public Affairs Director

PPPP/55

From: Harrington, Holly
To: Batkin, Joshua
Subject: RE: Hey dude
Date: Friday, March 18, 2011 10:19:00 AM

What is my name?

-----Original Message-----
From: Batkin, Joshua
Sent: Thursday, March 17, 2011 10:14 PM
To: Harrington, Holly
Subject: Hey dude

How you holding up?

Joshua C. Batkin
Chief of Staff
Chairman Gregory B. Jaczko
(301) 415-1820

DPPP/56

From: Maier, Bill
Sent: Friday, March 18, 2011 9:55 AM
To: McIntyre, David; LIA04 Hoc; OST05 Hoc
Subject: RE: 10 mile EPZ and 50 mile evacuation zone in Japan

Cindy/Kim,

If this has LT approval, please blast out an e-mail to all RSLOs giving them permission to disseminate. We'll take it from there.

Bill

From: McIntyre, David
Sent: Friday, March 18, 2011 8:53 AM
To: LIA04 Hoc
Cc: Maier, Bill
Subject: RE: 10 mile EPZ and 50 mile evacuation zone in Japan

By all means, yes!

From: LIA04 Hoc
Sent: Friday, March 18, 2011 9:52 AM
To: McIntyre, David
Cc: Maier, Bill
Subject: FW: 10 mile EPZ and 50 mile evacuation zone in Japan
Importance: High

Dave,

Can this be sent to federal , State, and local government partners? We noticed that this particular bullet is in the approved 3/18 talking points. Bill Maier needs to know ASAP.

Thanks,
Cindy Flannery

From: LIA04 Hoc
Sent: Thursday, March 17, 2011 8:49 PM
To: Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; Maier, Bill; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena
Cc: Piccone, Josephine; LIA06 Hoc; OST05 Hoc; Harrington, Holly; Collins, Elmo; Dean, Bill; Heck, Jared; McCree, Victor; Pederson, Cynthia; Satorius, Mark; Flannery, Cindy; LIA04 Hoc; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michelle; Turtil, Richard; Virgilio, Rosetta
Subject: 10 mile EPZ and 50 mile evacuation zone in Japan
Importance: High

RSLOs:

Many of your states and others have inquired about the 10 mile EPZ and the 50 mile evacuation recommendation as stated in the NRC's press release of March 16 (No. 11-050), which states "the NRC believes it is appropriate for U.S. residents within 50 miles of the Fukushima reactors to evacuate."

DPPP/57

The following has been provided by OPA on March 17 through its approved Talking Points.

- The 10-mile EPZ reflects the area where projected doses from design basis accidents at nuclear power plants would not exceed the EPA's protective action guidelines, and we are confident that it would be adequate even for severe accidents. However, the 10-mile zone was always considered a base for emergency response that could be expanded if the situation warranted. The situation in Japan, with four reactors experiencing exceptional difficulties simultaneously, creates the need to expand the EPZ beyond the normal 10-mile radius. We have said from the beginning of this crisis that the NRC would analyze this situation for any lessons that can be derived to improve our oversight of U.S. nuclear power plants. Emergency planning will be part of that review.

Richard Turtil
State Liaison – Liaison Team
Incident Response Center

From: OST05 Hoc
Sent: Friday, March 18, 2011 9:56 AM
To: Maier, Bill; LIA04 Hoc; Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena
Cc: Piccone, Josephine; LIA06 Hoc; Harrington, Holly; Flannery, Cindy; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michelle; Turtil, Richard; Virgilio, Rosetta; Howell, Linda; Collins, Elmo; Howell, Art
Subject: RE: 10 mile EPZ and 50 mile evacuation zone in Japan

All,

It has been confirmed that this statement may be sent out to our Federal, State, and Local partners.

Kim Lukes
State Liaison – Liaison Team
Incident Response Center

From: Maier, Bill
Sent: Friday, March 18, 2011 9:52 AM
To: LIA04 Hoc; Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena
Cc: Piccone, Josephine; LIA06 Hoc; OST05 Hoc; Harrington, Holly; Flannery, Cindy; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michelle; Turtil, Richard; Virgilio, Rosetta; Howell, Linda; Collins, Elmo; Howell, Art
Subject: RE: 10 mile EPZ and 50 mile evacuation zone in Japan

I still have my reservations about the adequacy of the statement below to satisfy our partners in off-site radiological emergency preparedness.

I believe if a discussion of some of the conservative assumptions used in the development of the 50 mile protective action recommendation could be included, that would make it a more satisfactory answer.

I recognize that maybe we can't share that information at this time, so I am willing to limit my information sharing to the statement below.

My request is:

DO THE RSLOs HAVE PERMISSION TO FORWARD THIS STATEMENT ON TO OUR FEDERAL, STATE AND LOCAL PARTNERS?

This action is preferable to just using it as a talking point within the NRC, as it will get the information out more quickly.

I will wait for permission to come from the NRC Liaison Team in Headquarters before sending it out.

Bill Maier

From: LIA04 Hoc
Sent: Thursday, March 17, 2011 7:49 PM

PPPP/58

To: Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; Maier, Bill; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena
Cc: Piccone, Josephine; LIA06 Hoc; OST05 Hoc; Harrington, Holly; Collins, Elmo; Dean, Bill; Heck, Jared; McCree, Victor; Pederson, Cynthia; Satorius, Mark; Flannery, Cindy; LIA04 Hoc; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michelle; Turtil, Richard; Virgilio, Rosetta
Subject: 10 mile EPZ and 50 mile evacuation zone in Japan
Importance: High

RSLOs:

Many of your states and others have inquired about the 10 mile EPZ and the 50 mile evacuation recommendation as stated in the NRC's press release of March 16 (No. 11-050), which states "the NRC believes it is appropriate for U.S. residents within 50 miles of the Fukushima reactors to evacuate."

The following has been provided by OPA on March 17 through its approved Talking Points.

- The 10-mile EPZ reflects the area where projected doses from design basis accidents at nuclear power plants would not exceed the EPA's protective action guidelines, and we are confident that it would be adequate even for severe accidents. However, the 10-mile zone was always considered a base for emergency response that could be expanded if the situation warranted. The situation in Japan, with four reactors experiencing exceptional difficulties simultaneously, creates the need to expand the EPZ beyond the normal 10-mile radius. We have said from the beginning of this crisis that the NRC would analyze this situation for any lessons that can be derived to improve our oversight of U.S. nuclear power plants. Emergency planning will be part of that review.

Richard Turtil
State Liaison – Liaison Team
Incident Response Center

From: LIA02 Hoc
Sent: Friday, March 18, 2011 9:11 AM
To: LIA08 Hoc; LIA06 Hoc
Subject: New NISA press release
Attachments: E30_NISA Press Release_English.pdf

For distribution – going to share a copy with RST.

PPPP/59

March 18, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 30th Release)
(As of 15:00 March 18th, 2011)

Nuclear and Industrial Safety Agency (NISA) confirmed the current situation of Onagawa NPS, Tohoku Electric Power Co. Inc.; Fukushima Dai-ichi and Fukushima Dai-ni NPSs, Tokyo Electric Power Co. Inc. (TEPCO); Tokai Dai-ni NPS, Japan Atomic Power Co. Inc. as follows:

Major updates are as follows.

1. Nuclear Power Stations (NPS)

● Fukushima Dai-ichi NPS

<Situation of Water Spray>

- The water spray from the ground using 6 fire engines (6 tons of water per car) by the Self-Defence Force. (from before 14:00 till 14:38 March 18th)
- The water spray from the ground using a fire engine provided by the US Military (finished at 14:45 March 18th)
- Arrival of hyper rescue vehicles (30 cars) at J village for the water spray from the ground. (14:45 March 18th)

<Spent Fuel Shared Storage Facility>

- As of 11:19 March 18th, the water temperature in the pool is 55℃.

2. Action taken by NISA and other agencies

[March 18th]

13:00 Ministry of Education, Culture, Sports, Science and Technology decided to reinforce the nation-wide monitoring survey in the emergency of Fukushima Dai-ichi and Dai-ni NPS.

<Situation of the injured>

- A person who visited the clinic in Fukushima Dai-ni NPS from a

transformer sub-station, claiming of a stomachache, was transferred to a clinic in Iwaki city, because the person was not contaminated.

1. The status of operation at NPS (Number of automatic shutdown units: 10)

- Fukushima Dai-ichi NPS, TEPCO
  (Okuma Town and FutabaTown, Futaba County, Fukushima Prefecture)

(1) The status of operation

Unit 1 (460MWe): automatic shutdown
Unit 2 (784MWe): automatic shutdown
Unit 3 (784MWe): automatic shutdown
Unit 4 (784MWe): in periodic inspection outage
Unit 5 (784MWe): in periodic inspection outage
Unit 6 (1,100MWe): in periodic inspection outage

(2) Major Plant Parameters (14:00 March 18th)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Reactor Pressure*1 [MPa]	0.270(A) 0.247(B)	0.087(A) 0.072(B)	0.083 (A) 0.101(B)	—	1.322	0.671
CV Pressure (D/W) [kPa]	Not available	130	155	—	—	—
Reactor Water Level*2 [Mm]	−1,700(A) down scale(B)	−1,400(A) Not available(B)	−2,000(A) −2,300(B)	—	1,969	2,712
Suppression Pool Water Temperature (S/C) [℃]	—	—	—	—	—	—
Suppression Pool Pressure (S/O) [kPa]	Not available	down scale	down scale	—	—	—
Spent Fuel Pool Water Temperature [℃]	—	—	—	84	66.3	64.0
Time of Measurement	07:55 March 18th	07:55 March 18th	12:35 March 18th	04:18 March 14th	13:00 March 18th	13:00 March 18th

*1:Converted from reading value to absolute pressure

*2: Distance from the top of fuel

(3) Report concerning other incidents

- TEPCO reported to NISA the event in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi. (15:42 March 11th)
- TEPCO reported to NISA the event (Loss of reactor cooling function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Units 1 and 2 of Fukushima Dai-ichi. (16:36 March 11th)
- The cable for receiving electricity from the transmission line of Tohoku Electric Power Company was installed. It is scheduled to be connected to Unit 2 after the completion of discharge work. (17:30 March 17th) The content of operations for recovery of external power supply to Unit 1 to 4 (Power supply from Electric transmission grid of Tohoku Electric Power Co., and from the route via transformer sub-station of TEPCO) is being confirmed. (06:30 March 18th)

<Unit 1>

- Seawater was injected to RPV via the Fire Extinguishing System Line (Started up 11:55 March 13th)
  →Temporary interruption of the injection (01:10 March 14th)
- The sound of explosion in Unit 1 occurred. (15:36 March 12nd)
- Seawater is being injected. (as of 15:00 March 18th)

<Unit 2>

- Water injection function was sustained. (14:00 March 13th)
- The Blow-out Panel of reactor building was opened due to the explosion of the Unit 3 reactor building. (After 11:00 March 14th)
- Reactor water level was decreasing. (13:18 March 14th) TEPCO reported to NISA the event (Loss of reactor cooling functions) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (13:49 March 14th)
- Seawater injection to RPV was ready through the Fire Extinguishing System line. (19:20 March 14th)
- TEPCO evaluated core damage of Unit 2 was "less than 5%" (22:14

March 14th)

- Water level in RPV in Unit 2 is decreasing. (22:50 March 14th)
- A sound of explosion was made in Unit 2. As the pressure in Suppression Chamber decreased (06:10 March 15th), there was a possibility that an incident occurred in the Chamber. (06:20 March 15th)
- Seawater is being injected. White smoke continues to be generated from the Blow-out Panel of reactor building.(As of 15:00 March 18th)

<Unit 3>

- Fresh water was injected to RPV via the Fire Extinguishing System Line (FESL). (11:55 March 13th)
- Seawater was injected to RPV via FESL. (13:12 March 13th)
- Injection of seawater for Unit 1 and Unit 3 to the Primary Containment Vessel (PCV) was interrupted due to the lack of seawater in pit. (01:10 March 14th)
- For Unit 3 injection of seawater into PCV was restarted (03:20 March 14th)
- The pressure in PCV of Unit 3 rose unusually. (7:44 March 14th) TEPCO reported to NISA the event (Loss of reactor cooling function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (7:52 March 14th)
- For Unit 3 the explosion like Unit 1 occurred around the Reactor Building (11:01 March 14th)
- The white smoke like steam generated from Unit 3. (08:30 March 16th)
- Because of the possibility that PCV of Unit 3 was damaged, the workers evacuated from the central control room of Unit 3 and 4 (common control room). (10:45 March 16th) Thereafter the operators returned to the room and restarted the operation for water injection. (11:30 March 16th)
- Seawater was discharged 4 times to Unit 3 by the helicopters of the Self-Defence Force. (9:48, 9:52, 9:58 and 10:01 March 17th)
- The riot police arrived at the site for grand discharge. (16:10 March 17th)
- The Self-Defence Force started the water spray from 19:35 March 17th.
- The water spray from the ground was carried out by the riot police (from

19:05 till 19:13 March 17th)

- The water spray from the ground was carried out by the Self-Defence Force using 5 cars (March 17th)
  (The starting time of water spray by each car: 19:35, 19:45, 20:00 and 20:07 March 17th)
- The water spray from the ground using 6 fire engines (6 tons of water per car) was carried out by the Self-Defence Force. (from before 14:00 till 14:38 March 18th)
- The water spray from the ground using a fire engine provided by the US Military was carried out. (finished at 14:45 March 18th)
- Hyper rescue vehicles (30 cars) arrived at J village for the water spray from the ground. (14:45 March 18th)
- Seawater is being injected to RPV. White Smoke continues to be generated. (As of 15:00 March 18th)

<Unit 4>

- It was confirmed that a part of wall in the operation area of Unit 4 was damaged. (06:14 March 15th)
- The fire at Unit 4 occurred. (09:38 March 15th) TEPCO reported that the fire was extinguished spontaneously. (11:00 March 15th)
- The temperature of water in the Spent Fuel Storage Pool at Unit 4 had increased. (84 ℃ at 04:08 March 14th)
- The fire occurred at Unit 4. (5:45 March 15th) TEPCO reported that no fire could be confirmed on the ground.(06:15 March 16th)
- Because of the replacement work of the Shroud of RPV, no fuel was inside the PRV. White Smoke continues to be generated (As of 15:00 March 18th)

<Units 5 and 6>

- Emergency Diesel Generator (1 unit) for Unit 6 is operable and supplying electricity to Units 5 and 6. Water injection to the PRV and Spent Fuel Pool through MUWC is progressing.

<Spent Fuel Storage Facility>

- It was confirmed that the water level of spent fuel storage pool was maintained full at after 06:00 March 18.

- As of 11:19 March 18th, the water temperature in the pool is 55℃.

● Fukushima Dai-ni NPS (TEPCO)

(Naraha Town / Tomioka Town, Futaba County, Fukushima Prefecture.)

(1) The status of operation

Unit1 (1,100MWe): automatic shutdown, cold shut down at 17:00, March 14th

Unit2 (1,100MWe): automatic shutdown, cold shut down at 18:00, March 14th

Unit3 (1,100MWe): automatic shutdown, cold shut down at 12:15, March 12th

Unit4 (1,100MWe): automatic shutdown, cold shut down at 07:15, March 15th

(2) Major plant parameters (As of 13:00 March 18th)

	Unit	Unit 1	Unit 2	Unit 3	Unit 4
Reactor Pressure*1	MPa	0.18	0.11	0.13	0.15
Reactor water temperature	℃	40.9	37.8	27.2	34.8
Reactor water level*2	Mm	10,596	10,146	7,504	8,905
Suppression pool water temperature	℃	32	26	43	33
Suppression pool pressure	kPa (abs)	144	117	128	121
Remarks		cold shutdown	cold shutdown	cold shutdown	cold shutdown

*1:Converted from reading value to absolute pressure

*2: Distance from the top of fuel

(3) Report concerning other incidents

- TEPCO reported to NISA the event in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 1 of Fukushima Dai-ni NPS. (18:08 March

11th)

- TEPCO reported to NISA the events in accordance with the Article 10 regarding Units 1, 2 and 4 of Fukushima Dai-ni NPS. (18:33 March 11th)
- TEPCO reported to NISA the event (Loss of pressure suppression function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 1 of Fukushima Dai-ni NPS. (5:22 March 12th)
- TEPCO reported to NISA the event (Loss of pressure suppression function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 2 of Fukushima Dai-ni NPS. (5:32 March 12th)
- TEPCO reported to NISA the event (Loss of pressure suppression function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 4 of Fukushima Dai-ni NPS. (6:07 March 12th)

● Onagawa NPS (Tohoku Electric Power Co. Inc.)
(Onagawa Town, Oga County and Ishinomaki City, Miyagi Prefecture)

(1) The status of operation

Unit 1 (524MWe): automatic shutdown, cold shut down at 0:58, March 12th
Unit 2 (825MWe): automatic shutdown, cold shut down at earthquake
Unit 3 (825MWe): automatic shutdown, cold shut down at 1:17, March 12th

(2) Readings of monitoring post

Reading of monitoring post:
MP2 (Monitoring at the North End of Site Boundary)
approx. 6,500 nGy/h (19:00 March 14th)
→approx. 5,400 nGy/h (19:00 March 15th)

(3) Report concerning other incidents

- Fire Smoke on the first basement of the Turbine Building was confirmed to be extinguished. (22:55 on March 11th)
- Tohoku Electric Power Co. reported to NISA in accordance with the

Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (13:09 March 13th)

2. Action taken by NISA

(March 11th)

14:46 Set up of the NISA Emergency Preparedness Headquarters (Tokyo) immediately after the earthquake

15:42 TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

16:36 TEPCO recognized the event (Loss of cooling function) in accordance with the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Units 1 and 2 of Fukushima Dai-ichi NPS. (Reported to NISA at 16:45)

18:08 Regarding Unit 1 of Fukushima Dai-ni NPS, TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

18:33 Regarding Units 1, 2 and 4 of Fukushima Dai-ni NPS, TEPCO reported to NISA in accordance with the Article 10 of Act on Special Measures Concerning Nuclear Emergency Preparedness.

19:03 Government declared the state of nuclear emergency. (Establishment of Government Nuclear Emergency Response Headquarters and Local Emergency Response Headquarters)

20:50 Fukushima Prefecture's Emergency Response Headquarters issued a direction for the residents within 2 km radius from Unit 1 of Fukushima Dai-ichi NPS to evacuate. (The population of this area is 1,864.)

21:23 Directives from Prime Minister to the Governor of Fukushima Prefecture, the Mayor of Okuma Town and the Mayor of Futaba Town were issued regarding the event occurred at Fukushima Dai-ichi NPS, TEPCO, in accordance with the Paragraph 3, the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness as follows:

- Direction for the residents within 3km radius from Unit 1 to evacuate
- Direction for the residents within 10km radius from Unit 1 to stay

in-house

24:00 Vice Minister of Economy, Trade and Industry, Ikeda arrived at the Local Emergency Response Headquarters

(March12th)

05:22 Regarding Unit 1 of Fukushima Dai-ni NPS, TEPCO recognized the event (Loss of pressure suppression function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (reported to NISA at 06:27)

05:32 Regarding Unit 2 of Fukushima Dai-ni NPS, TEPCO recognized the event (Loss of pressure suppression function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

05:44 Residents within 10km radius from Unit 1 of Fukushima Dai-ichi NPS shall evacuate by the Prime Minister Direction.

06:07 Regarding of Unit 4 of Fukushima Dai-ni NPS, TEPCO recognized the event (Loss of pressure suppression function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

06:50 In accordance with the Paragraph 3, the Article 64 of the Nuclear Regulation Act, the order was issued to control the internal pressure of the Containment Vessel of Units 1 and 2 of Fukushima Dai-ichi NPS.

07:45 Directives from Prime Minister to the Governor of Fukushima Prefecture, the Mayors of Hirono Town, Naraha Town , Tomioka Town and Okuma Town were issued regarding the event occurred at Fukushima Dai-ni NPS, TEPCO, pursuant to the Paragraph 3, the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness as follows:

- Direction for the residents within 3km radius from Fukushima Dai-ni NPS to evacuate
- Direction for the residents within 10km radius from Fukushima Dai-ni NPS to stay in-house

17:00 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness

regarding Fukushima Dai-ichi NPS.

17:39 Prime Minister directed evacuation of the residents within the 10 km radius from Fukushima-Dai-ni NPS

18:25 Prime Minister directed evacuation of the residents within the 20km radius from Fukushima Dai-ichi NPS

19:55 Directives from Prime Minister was issued regarding seawater injection to Unit No.1 of Fukushima Dai-ichi NPS.

20:05 Considering the Directives from Prime Minister and pursuant to the Paragraph 3, the Article 64 of the Nuclear Regulation Act, order was issued to inject seawater to Unit 1 of Fukushima Dai-ichi NPS.

20:20 At Unit 1 of Fukushima Dai-ichi NPS, seawater injection started.

(March 13th)

05:38 TEPCO reported to NISA the event (Total loss of coolant injection function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 3 of Fukushima Dai-ichi NPS. Recovering efforts by TEPCO of the power source and coolant injection function and work on venting are under way.

09:01 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

09:08 Pressure suppression in the Containment Vessel and fresh water injection started at Unit 3 of Fukushima Dai-ichi NPS.

09:20 The Pressure Vent Valve of Unit 3 of Fukushima Dai-ichi NPS was opened.

09:30 The order was issued for the Governor of Fukushima Prefecture, the Mayors of Okuma Town, Futaba Town, Tomioka Town and Namie Town in accordance with the Act on Special Measures Concerning Nuclear Emergency Preparedness on the contents of radioactivity decontamination screening.

09:38 TEPCO reported to NISA that Unit 1 of Fukushima Dai-ichi NPS reached a situation specified in the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

13:09 Tohoku Electric Power Co. reported to NISA that Onagawa NPS

reached a situation specified in the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

13:12 Fresh water injection was switched to seawater injection at Unit 3 of Fukushima Dai-ichi NPS.

14:36 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 14th)

01:10 Seawater injection at Unit 1 and Unit 3 of Fukushima Dai-ichi NPS were temporarily interrupted due to the lack of seawater in pit.

03:20 Seawater injection at Unit 3 of Fukushima Dai-ichi NPS was restarted.

04:40 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

05:38 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

07:52 TEPCO reported to NISA the event (Unusual rise of the pressure in PCV) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 3 of Fukushima Dai-ichi NPS.

13:25 Regarding Unit 2 of Fukushima Dai-ichi NPS, TEPCO recognised the event (Loss of cooling function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

22:13 TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ni NPS.

22:35 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 15th)

00:00: The acceptance of experts from IAEA was decided. NISA agreed to accept the offer of dispatching of the expert on NPS damage from IAEA considering the intention by Mr. Amano, Director General of IAEA. Therefore, the schedule of expert acceptance will be planned from now on according to the situation.

00:00: NISA also decided the acceptance of experts dispatched from NRC.

07:21 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

07:24 Incorporated Administration Agency, Japan Atomic Energy Agency (JAEA) reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding, Nuclear Fuel Cycle Engineering Laboratories, Tokai Research and Development Centre.

07:44 JAEA reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Nuclear Science Research Institute.

08:54 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

10:30 According to the Nuclear Regulation Act, Minister of Economy, Trade and Industry issued the directives as follows.

For Unit 4: To extinguish fire and to prevent the occurrence of re-criticality

For Unit 2: To inject water to reactor vessel promptly and to vent Drywell.

10:59 Considering the possibility of lingering situation, it is decided that the function of the Local Emergency Response Headquarter is moved to the Fukushima Prefectural Office.

11:00 Prime Minister directed the in-house stay area.

In-house stay was additionally directed to the residents in the area

from 20 km to 30 km radius from Fukushima Dai-ichi NPS considering in-reactor situation.

16:30 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

22:00 According to the Nuclear Regulation Act, Minister of Economy, Trade and Industry issued the following directive.

For Unit 4: To implement the injection of water to the Spent Fuel Storage Pool.

23:46 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 18th)

13:00 Ministry of Education, Culture, Sports, Science and Technology decided to reinforce the nation-wide monitoring survey in the emergency of Fukushima Dai-ichi and Dai-ni NPS.

< Possibility on radiation exposure (As of 15:00 March 18th) >

<Exposure of residents>

(1) Including the evacuees from Futaba Public Welfare Hospital to Nihonmatsu City Fukushima Gender Equality Centre as the result of measurement of 133 persons at the Centre, 23 persons counted more than 13,000 cpm were decontaminated.

(2) The 35 residents transferred from Futaba Public Welfare Hospital to Kawamata Town Saiseikai Kawamata Hospital by private bus arranged by Fukushima Prefecture were judged to be not contaminated by the Prefectural Response Centre.

(3) As for the about 100 residents in Futaba Town evacuated by bus, the results of measurement for 9 of the 100 residents were as follows. The evacuees were divided into two groups which joined later to Nihonmatsu

City Fukushima Gender Equality Centre.

No. of Counts	No. of Persons
18,000cpm	1
30,000-36,000cpm	1
40,000cpm	1
little less than 40,000cpm*	1
very small counts	5

*(These results were measured without shoes, though the first measurement exceeded 100,000cpm)

(4) The screening was started at the Off site Center in Okuma Town from March 12th to 15th. 162 people received examination until now. At the beginning, the reference value was set at 6,000cpm. 110 people were at the level below 6,000 cpm and 41 people were at the level of 6,000 cpm or more. When the reference value was increased to 13,000 cpm afterward, 8 people were at the level below 13,000 cpm and 3 people are at the level of 13,000 cpm or more.

The 5 out of 162 people examined were transported to hospital after being decontaminated.

(5) The Fukushima Prefecture carried out the evacuation of patients and personnel of the hospitals located within 10km area. The screening of all the members showed that 3 persons have the high counting rate. These members were transported to the secondary medical institute of exposure. As a result of the screening on 60 fire fighting personnel involved in the transportation activities, the radioactivity higher than twice of the back ground was detected on 3 members even after decontamination and all the 60 members were decontaminated.

<Exposure of workers>

(1) As for the 18 workers conducting operations in Fukushima Dai-ichi NPS, results of measurements are as follows;

One worker: 106.3 mSv. At the level of exposure no internal exposure and medical treatment was not required.

Other workers: No threat of internal exposure and no medical treatment needed.

(2) The 6 out of 7 people working at the time of explosion at the Unit 3 of Fukushima Dai-ichi NPS injured and were conscious. The detailed measurement data are not available.

<Others>

(1) Fukushima Prefecture has started the screening from 13 March at two health office in the prefecture. It is undertaken rotating the evacuation sites, and at 12 health offices (set up permanently), etc. The results of screening are being totalled up.

(2) 5 members of Self-Defence Force who worked for water supply in Fukushima Dai-ichi NPS were exposed. After the work (March 12th), 30,000 cpm was counted by the measurement at Off site Centre. The counts after decontamination were between 5,000 and 10,000 cpm. One member was transferred to National Institute of Radiological Science. No other exposure of the Self-Defence Force member was confirmed at the Ministry of Defence.

(3) As for policeman, the decontaminations of two policemen were confirmed by the National Police Agency. Nothing unusual was reported.

<Direction of administrating stable Iodine during evacuation>

On March 16th, the Local Emergency Response Headquarter issued "the direction to administer the stable Iodine during evacuation from the evacuation area (20 km radius)" to the Prefecture Governors and the heads of cities, towns and villages (Tomioka town, Hutaba town, Okuma town, Namie town, Kawauchi village, Naraha town, Minamisouma city, Tamura city, Kazurao village, Hirono town, Iwaki city and Iidate village).

<Situation of the injured (As of 15:00 March 18th)>

1. Injury due to earthquake
   - Two employees (slightly)
   - Two subcontract employees (one fracture in both legs)
   - Two missing (TEPCO's employee, missing in the turbine building of Unit 4)

- One emergency patient (According to the local prefecture, one patient of cerebral infarction was transported by the ambulance).
- Ambulance was requested for one employee complaining the pain at left chest outside of control area (conscious).
- Two employees complaining discomfort wearing full-face mask in the main control room were transported to the industrial doctor of Fukushima Dai-ni NPS.

2. Injury due to the explosion of Unit 1 of Fukushima Dai-ichi NPS
   - Four employees were injured at the explosion and smoke of Unit 1 around turbine building (out of control area) and were examined by Kawauchi clinic.

3. Injury due to the explosion of Unit 3 of Fukushima Dai-ichi NPS
   - Four TEPCO's employees
   - Three subcontractor employees
   - Four members of Self-Defence Force (one of them was transported to National Institute of Radiological Sciences considering internal possible exposure. The examination resulted in no internal exposure. The member was discharged from the institute on March 16th.)

4. Other injuries
   - A person who visited the climic in Fukushima Dai-ni NPS from a transformer sub-station, claiming of a stomachache, was transformed to a clinic in Iwaki city, because the person was not contaminated.

<Situation of Resident Evacuation (As of 15:00 March 18th)>

At 11:00 March 15th, Prime Minister directed in-house stay to the residents in the area from 20 km to 30 km radius from Fukushima Dai-ichi NPS. The directive was conveyed to Fukushima Prefecture and related municipalities.

Regarding the evacuation as far as 20-km from Fukushima Dai-ichi NPS and 10-km from Fukushima Dai-ni, necessary measures have already been taken.

- The in-house stay in the area from 20 km to 30 km from Fukushima Dai-ichi NPS is made fully known to the residents concerned.
- Cooperating with Fukushima Prefecture, livelihood support to the residents in the in-house stay area are implemented.

(Contact Person)
Mr. Toshihiro Bannai
Director, International Affairs Office,
NISA/METI
Phone:+81-(0)3-3501-1087

From: Deavers, Ron
Sent: Friday, March 18, 2011 8:53 AM
To: LIA08 Hoc
Cc: LIA02 Hoc; LIA06 Hoc; Burnell, Scott; Fehst, Geraldine; Stahl, Eric
Subject: RE: hydrogen leakage measurement inquires from Mexico

Thanks Rani.

Ron Deavers

-----Original Message-----
From: LIA08 Hoc
Sent: Thursday, March 17, 2011 8:30 PM
To: Deavers, Ron
Cc: LIA02 Hoc; LIA06 Hoc; Burnell, Scott; Fehst, Geraldine; Stahl, Eric
Subject: RE: hydrogen leakage measurement inquires from Mexico

Hi Ron,
I do not believe the IRC staff should be responding to this request from an member of the Mexican nuclear power industry. Suggest OIP handle this through non-emergency channels. Sound okay to you?
Rani Franovich
Liaison Team Coordinator

-----Original Message-----
From: LIA02 Hoc
Sent: Thursday, March 17, 2011 8:20 PM
To: LIA08 Hoc
Subject: FW: hydrogen leakage measurement inquires from Mexico

-----Original Message-----
From: Deavers, Ron
Sent: Thursday, March 17, 2011 7:26 PM
To: LIA02 Hoc
Cc: Bonaccorso, Amy; Tobin, Jennifer; Ridge, Christianne; Deavers, Ron
Subject: FW: hydrogen leakage measurement inquires from Mexico

Forward foreign info request ...

-----Original Message-----
From: OPA Resource
Sent: Thursday, March 17, 2011 6:19 PM
To: Deavers, Ron; Bonaccorso, Amy
Subject: FW: hydrogen leakage measurement inquires from Mexico

PPPP/60

-----Original Message-----
From: PDR Resource
Sent: Thursday, March 17, 2011 5:49 PM
To: OPA Resource
Subject: hydrogen leakage measurement inquires from Mexico

This requester in Mexico sent their questions to the web team overnight. The web team forwarded them to us.

Are these questions something we should answer, or should OIP respond? If so, I don't know have a general e-mail address for OIP.

Thanks,
Karen
PDR
415-4737

-----Original Message-----
From: NRCWEB Resource
Sent: Thursday, March 17, 2011 3:00 AM
To: PDR Resource
Subject: FW: Response from "Contact the NRC Web Site Staff"

-----Original Message-----
From: Francisco Tijerina [mailto:francisco.tijerina@cfe.gob.mx]
Sent: Thursday, March 17, 2011 2:46 AM
To: NRCWEB Resource
Subject: Response from "Contact the NRC Web Site Staff"

Below is the result of your feedback form. It was submitted by

Francisco Tijerina (francisco.tijerina@cfe.gob.mx) on Thursday, March 17, 2011 at 02:46:06
---

comments: could you send me pleasse the next informaton:
1) I need information (NUREG, GUIDE REGULATORY, GENERIC LETER,ETC) connected with "hydrogen leakage measurement" in building areas of RFW by used the injection of hydrogen into Reactor Feed Water system to mitigate failure in material internal of reactor.
2) which are nuclear plants in EEUU, that use technology romote for measure hydrogen leakage in RFW?
3) which is the technology of measure hydrogen leakage approved by NRC (Topical Report)?

Thanks by your technical support

Best ragards

Francisco Tijerina
Laguna Verde Nuclear Plant
francisco.tijerina@cfe.gob.mx

organization: LAGUNA VERDE NUCLEAR PLANT

address1: LAGUNA VERDE NUCLEAR PLANT

address2:

city: VERACRUZ

state: ---

zip:

country: MEXICO

phone: 522299899090

From: LIA06 Hoc
Sent: Friday, March 18, 2011 1:47 AM
To: ET02 Hoc
Subject: event update
Attachments: Doc1.doc

PPPP/11

Current Status (3/18/11):

At 0946 EST, March 11, 2011, the NRC entered Monitoring Mode and the agency continues to monitor the unfolding events in Japan. The Headquarters Operations Center is staffed.
A total of 11 NRC experts supporting USAID response efforts from the NRC are in Japan and have engaged with the US Ambassador' s staff.
At 0550 EDT, March 14, 2011, the NRC experts in Japan reported that the Japanese have requested US technical assistance with cooling the Fukushima Daiichi Units 1, 2, and 3. The effort is being coordinated by the US Ambassador. At 0900 EDT, March 15, 2011, the Japanese government accepted DOE"s Radiological Assistance Program (RAP) team assistance, which includes Aerial Measuring System (AMS) fly-overs.
NRC provided the White House with information on protective measures for NRC staff in Japan and information to provide advice for other federal workers in Japan. The current protective action recommendation for U.S. citizens residing within 50 miles (80 km) of the Fukushima Daiichi site is to evacuate.
The US State Department has approved voluntary authorized departure of family members at the U.S. Embassy in Tokyo, the U.S. Consulate in Nagoya and the Foreign Service Institute in Yokohama.

Current focus is on addressing limited water inventories in SFPs. Units 3 and 4 have most critical needs.

From: LIA04 Hoc
Sent: Friday, March 18, 2011 8:33 PM
To: Virgilio, Rosetta
Subject: RE: Recommendation for NRC Telecon (with DOE) with the States

Yes, still here.

From: Virgilio, Rosetta
Sent: Friday, March 18, 2011 7:24 PM
To: LIA04 Hoc
Subject: RE: Recommendation for NRC Telecon (with DOE) with the States

Rich - RU still on?

From: LIA04 Hoc
Sent: Friday, March 18, 2011 6:33 PM
To: LIA06 Hoc
Cc: Piccone, Josephine; Virgilio, Rosetta; Jackson, Deborah
Subject: Recommendation for NRC Telecon (with DOE) with the States
Importance: High

Mark Thaggard/Mark Lombard/Tim McGinty (Liaison Team Directors):

NRC's State Stakeholders have expressed a desire to hear directly, through a joint DOE/NRC teleconference, about the current status of issues resulting from the events in Japan. This meeting will need to be coordinated with Federal family members, particularly DOE and possibly EPA. This meeting should be led by one of the NRC ambassadors to keep the message(s) consistent. The States also wish to have an opportunity to have some of their questions and concerns heard and addressed. We recommend this request be presented to the ET.

FSME highly recommends such a meeting be organized:

- Other Federal agencies (HHS for one) has held such meetings both Nationally and at Regional levels in the U.S. and has received great feedback from those meetings; HHS is holding such another meeting at 5:00 pm tonight;
- The White House has held a regional meeting of West Coast States and Pacific Island Countries both on 3/17 and another to be held on 3/18; they have also proposed a meeting for All State Governors for 3/21 (not yet announced – close hold due to it possibly not happening);
- The added value from such a meeting should not be discounted; State stakeholders feel they are working in a vacuum at times, and such outreach and opportunity from the Federal family provides an outstanding opportunity for communication and provides a fine measure of good will.
- There is concern that following this event (several weeks from now), our State stakeholders will reflect on, and will communicate to us, our having been pro-active in reaching out, or our not having made the effort.

3x per week possible.

PPPP/12

Richard Turtil
State Liaison – Liaison Team
Incident Response Center

From: LIA02 Hoc
Sent: Friday, March 18, 2011 5:47 AM
To: Virgilio, Martin
Cc: Doane, Margaret; Shaffer, Mark R; LIA06 Hoc; LIA08 Hoc
Subject: IAEA Conference Call

Marty Virgilio reached out to the IAEA at 0330, March 18th and spoke with Jim Lyons and Denis Flory about the Japanese accident. Highlights of the call include:

- Marty stated that the purpose of the call was to try to ensure the efforts of IAEA and NRC related to the Japanese accident were complementary.
- Denis Flory stated that DG Amano went to visit Japan for the purpose of meeting with Japanese government officials for fact finding, and to improve communications flow and relations. There is no intended message to be passed. Khammar Mrabit, Head of Safety and Security Coordination Section was also in attendance.
- IAEA also sent a team of two technicians to take radiological measurements.
- Jim Lyons stated that IAEA was setting up two teams in Vienna to analyze data from the accident. This included a team for Safety Assessment and one for Radiological Consequences. Jim stated that the plan has strong support from member states and asked NRC to consider sending technical experts to support the teams.
- Marty presented NRC's priority approach with regard to the accident, discussed the composition and purpose of the NRC Japan team, and NRC's challenges in supporting the Japanese recovery efforts.
- Denis Flory provided that IAEA felt frustration concerning the limited communications from the Japanese government; he also noted that he thought there were delays in communications between the site, TEPCO and government that contributed to the problem. He implied concern with the Japanese staying with an INES 4 declaration.
- Jim Lyons stated the IAEA was most concerned now about the status of the SFPs due to their being a direct path for radiological release.
- Jim Lyons expressed frustration that the IAEA cannot publish any status of the accident based on news or reporting other than what is provided by the respective government, and cannot conjecture on possible outcomes due to IAEA charter.

PPPP/63

Contact Group Name: Liaison Team Distribution List-All

Members:

LIA01 Hoc	LIA01.Hoc@nrc.gov
LIA02 Hoc	LIA02.Hoc@nrc.gov
LIA03 Hoc	LIA03.Hoc@nrc.gov
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LIA12 Hoc	LIA12.Hoc@nrc.gov
OST05 Hoc	OST05.Hoc@nrc.gov

From: LIA02 Hoc
Sent: Friday, March 18, 2011 12:25 AM
To: RST01 Hoc; LIA06 Hoc
Subject: FW: translated NISA updates
Attachments: NISA 3-18 news release.pdf

FYI

-----Original Message-----
From: Danielle Emche [mailto:danielle.emche@gmail.com]
Sent: Friday, March 18, 2011 12:17 AM
To: LIA02 Hoc; LIA03 Hoc
Subject: translated NISA updates

Here's the translated update. I'm going to bed now!

PPPP/64

March 18, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 28th Release)
(As of 17:30 March 17th, 2011)

Nuclear and Industrial Safety Agency (NISA) confirmed the current situation of Onagawa NPS, Tohoku Electric Power Co. Inc.; Fukushima Dai-ichi and Fukushima Dai-ni NPSs, Tokyo Electric Power Co. Inc. (TEPCO); Tokai Dai-ni NPS, Japan Atomic Power Co. Inc. as follows:

Major updates are as follows.

1. Nuclear Power Stations (NPS)

- Fukushima Dai-ichi NPS
  - 4 times of seawater discharge to Unit 3 by the helicopters of Self-Defence Force (9:48, 9:52, 9:58, 10:01 March 17th)
  - Arrival of the riot police at the site for grand discharge (16:10 March 17th)
  - Cable installation to receive electricity from the transmission line of Tohoku Electric Power Company. Schedule to be connected to Unit 2 after the completion of discharge work. (17:30 March 17th)
  - Emergency Diesel Generator (1 unit) for Unit 6 operable. Supplying electricity to Unit 5 and 6. Water injection to Spent Fuel Pool through the Make up Water Condensate System (MUWC) progressing. Schedule to inject water to the Reactor Pressure Vessel (RPV) after the recovery of external power source.

1. The status of operation at NPS (Number of automatic shutdown units: 10)

- Fukushima Dai-ichi NPS, TEPCO
  (Okuma Town and FutabaTown, Futaba County, Fukushima Prefecture)

(1) The status of operation

Unit 1 (460MWe): automatic shutdown
Unit 2 (784MWe): automatic shutdown
Unit 3 (784MWe): automatic shutdown
Unit 4 (784MWe): in periodic inspection outage
Unit 5 (784MWe): in periodic inspection outage
Unit 6 (1,100MWe): in periodic inspection outage

(2) Major Plant Parameters (12:00 March 17th)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Reactor Pressure [MPag]	0.173 (A) 0.144(B)	−0.029(A) −0.047(B)	0.014 (A) 0.023(A)	—	1.100	0.740
CV Pressure (D/W) [kPa]	Not available	115	190	—	—	—
Reactor Water Level*1 [Mm]	−1,800(A) −1,800(B)	−1,800(A) Not available(B)	−1,950(A) −2,300(B)	—	1,870	1,309
Suppression Pool Water Temperature (S/C) [℃]	—	—	—	—	—	—
Suppression Pool Pressure (S/O) [kPa]	Not available	down scale	down scale	—	—	—
Spent Fuel Pool Water Temperature [℃]	—	—	—	84	64.2	62.5
Time of Measurement	11:30 March 17th	11:30 March 17th	11:10 March 17th	04:08 March 14th	12:00 March 17th	12:00 March 17th

*1: Distance from the top of fuel

(3) Report concerning other incidents

- TEPCO reported to NISA the event in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency

Preparedness regarding Fukushima Dai-ichi. (15:42 March 11th)

- TEPCO reported to NISA the event (Loss of reactor cooling function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Units 1 and 2 of Fukushima Dai-ichi. (16:36 March 11th)
- The cable for receiving electricity from the transmission line of Tohoku Electric Power Company was installed. It is scheduled to be connected to Unit 2 after the completion of discharge work. (17:30 March 17th)

<Unit 1>

- Seawater was injected to RPV via the Fire Extinguishing System Line (Started up 11:55 March 13th)
  →Temporary interruption of the injection (01:10 March 14th)
- The sound of explosion in Unit 1 occurred. (15:36 March 12nd)
- Seawater is being injected as of 17:30 March 17th.

<Unit 2>

- Water injection function was sustained. (14:00 March 13th)
- Reactor water level was decreasing. (13:18 March 14th) TEPCO reported to NISA the event (Loss of reactor cooling functions) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (13:49 March 14th)
- Seawater injection to RPV was ready through the Fire Extinguishing System line. (19:20 March 14th)
- TEPCO evaluated core damage of Unit 2 was "less than 5%" (22:14 March 14th)
- Water level in RPV in Unit 2 is decreasing. (22:50 March 14th)
- A sound of explosion was made in Unit 2. As the pressure in Suppression Chamber decreased (06:10 March 15th), there was a possibility that an incident occurred in the Chamber. (06:20 March 15th)
- Seawater is being injected as of 17:30 March 17th.

<Unit 3>

- Fresh water was injected to RPV via the Fire Extinguishing System

Line (FESL). (11:55 March 13th)

- Seawater was injected to RPV via FESL. (13:12 March 13th)
- Injection of seawater for Unit 1 and Unit 3 to the Primary Containment Vessel (PCV) was interrupted due to the lack of seawater in pit. (01:10 March 14th)
- For Unit 3 injection of seawater into PCV was restarted (03:20 March 14th)
- The pressure in PCV of Unit 3 rose unusually. (7:44 March 14th) TEPCO reported to NISA the event (Loss of reactor cooling function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (7:52 March 14th)
- For Unit 3 the explosion like Unit 1 occurred around the Reactor Building (11:01 March 14th)
- The white smoke like steam generated from Unit 3. (08:30 March 16th)
- Because of the possibility that PCV of Unit 3 was damaged, the workers evacuated from the central control room of Unit 3 and 4 (common control room). (10:45 March 16th) Thereafter the operators returned to the room and restarted the operation for water injection. (11:30 March 16th)
- Seawater was discharged 4 times to Unit 3 by the helicopters of Self-Defence Force. (9:48, 9:52, 9:58 and 10:01 March 17th)
- The riot police arrived at the site for grand discharge. (16:10 March 17th)
- Seawater is being injected to RPV as of 17:30 March 17th.

<Unit 4>

- It was confirmed that a part of wall in the operation area of Unit 4 was damaged. (06:14 March 15th)
- The fire at Unit 4 occurred. (09:38 March 15th) TEPCO reported that the fire was extinguished spontaneously. (11:00 March 15th)
- The temperature of water in the Spent Fuel Storage Pool at Unit 4 had increased. (84 ℃ at 04:08 March 14th)
- The fire occurred at Unit 4. (5:45 March 15th) TEPCO reported that no fire could be confirmed on the ground.(06:15 March 16th)
- The water injection is suspended as of 17:30 March 17th.

<Units 5 and 6>

- Emergency Diesel Generator (1 unit) for Unit 6 is operable and supplying electricity to Units 5 and 6. Water injection to the Spent Fuel Pool through MUWC is progressing. It is scheduled to inject water to RPV after the recovery of external power source.

● Fukushima Dai-ni NPS (TEPCO)
(Naraha Town / Tomioka Town, Futaba County, Fukushima Prefecture.)

(1) The status of operation

Unit1 (1,100MWe): automatic shutdown, cold shut down at 17:00, March 14th

Unit2 (1,100MWe): automatic shutdown, cold shut down at 18:00, March 14th

Unit3 (1,100MWe): automatic shutdown, cold shut down at 12:15, March 12th

Unit4 (1,100MWe): automatic shutdown, cold shut down at 07:15, March 15th

(2) Major plant parameters (As of 17:00, 17 March)

	unit	Unit 1	Unit 2	Unit 3	Unit 4
Reactor Pressure	MPag	0.09	0.04	0.04	0.06
Reactor water temperature	℃	44.5	43.0	26.8	40.6
Reactor water level*	mm	10,796	11,246	7,516	8,893
Suppression pool water temperature	℃	34	28	43	39
Suppression pool pressure	kPa	132	121	136	134
Remarks		cold shutdown	cold shutdown	cold shutdown	cold shutdown

*: Distance from the top of fuel

(3) Report concerning other incidents

- TEPCO reported to NISA the event in accordance with the Article 10 of

the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 1 of Fukushima Dai-ni NPS. (18:08 March 11th)

- TEPCO reported to NISA the events in accordance with the Article 10 regarding Units 1, 2 and 4 of Fukushima Dai-ni NPS. (18:33 March 11th)
- TEPCO reported to NISA the event (Loss of pressure suppression function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 1 of Fukushima Dai-ni NPS. (5:22 March 12th)
- TEPCO reported to NISA the event (Loss of pressure suppression function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 2 of Fukushima Dai-ni NPS. (5:32 March 12th)
- TEPCO reported to NISA the event (Loss of pressure suppression function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 4 of Fukushima Dai-ni NPS. (6:07 March 12th)

● Onagawa NPS (Tohoku Electric Power Co. Inc.)
(Onagawa Town, Oga County and Ishinomaki City, Miyagi Prefecture)

(1) The status of operation

Unit 1 (524MWe): automatic shutdown, cold shut down at 0:58, March 12th
Unit 2 (825MWe): automatic shutdown, cold shut down at earthquake
Unit 3 (825MWe): automatic shutdown, cold shut down at 1:17, March 12th

(2) Readings of monitoring post

Reading of monitoring post:
MP2 (Monitoring at the North End of Site Boundary)
approx. 6,500 nGy/h (19:00 March 14th)
→approx. 5,400 nGy/h (19:00 March 15th)

(3) Report concerning other incidents

- Fire Smoke on the first basement of the Turbine Building was confirmed

to be extinguished. (22:55 on March 11th)

- Tohoku Electric Power Co. reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (13:09 March 13th)

2. Action taken by NISA

(March 11th)

14:46 Set up of the NISA Emergency Preparedness Headquarters (Tokyo) immediately after the earthquake

15:42 TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

16:36 TEPCO recognized the event (Loss of cooling function) in accordance with the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Units 1 and 2 of Fukushima Dai-ichi NPS. (Reported to NISA at 16:45)

18:08 Regarding Unit 1 of Fukushima Dai-ni NPS, TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

18:33 Regarding Units 1, 2 and 4 of Fukushima Dai-ni NPS, TEPCO reported to NISA in accordance with the Article 10 of Act on Special Measures Concerning Nuclear Emergency Preparedness.

19:03 Government declared the state of nuclear emergency. (Establishment of Government Nuclear Emergency Response Headquarters and Local Emergency Response Headquarters)

20:50 Fukushima Prefecture's Emergency Response Headquarters issued a direction for the residents within 2 km radius from Unit 1 of Fukushima Dai-ichi NPS to evacuate. (The population of this area is 1,864.)

21:23 Directives from Prime Minister to the Governor of Fukushima Prefecture, the Mayor of Okuma Town and the Mayor of Futaba Town were issued regarding the event occurred at Fukushima Dai-ichi NPS, TEPCO, in accordance with the Paragraph 3, the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness as follows:

- Direction for the residents within 3km radius from Unit 1 to

evacuate
- Direction for the residents within 10km radius from Unit 1 to stay in-house

24:00 Vice Minister of Economy, Trade and Industry, Ikeda arrived at the Local Emergency Response Headquarters

(March12th)

05:22 Regarding Unit 1 of Fukushima Dai-ni NPS, TEPCO recognized the event (Loss of pressure suppression function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (reported to NISA at 06:27)

05:32 Regarding Unit 2 of Fukushima Dai-ni NPS, TEPCO recognized the event (Loss of pressure suppression function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

05:44 Residents within 10km radius from Unit 1 of Fukushima Dai-ichi NPS shall evacuate by the Prime Minister Direction.

06:07 Regarding of Unit 4 of Fukushima Dai-ni NPS, TEPCO recognized the event (Loss of pressure suppression function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

06:50 In accordance with the Paragraph 3, the Article 64 of the Nuclear Regulation Act, the order was issued to control the internal pressure of the Containment Vessel of Units 1 and 2 of Fukushima Dai-ichi NPS.

07:45 Directives from Prime Minister to the Governor of Fukushima Prefecture, the Mayors of Hirono Town, Naraha Town , Tomioka Town and Okuma Town were issued regarding the event occurred at Fukushima Dai-ni NPS, TEPCO, pursuant to the Paragraph 3, the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness as follows:
- Direction for the residents within 3km radius from Fukushima Dai-ni NPS to evacuate
- Direction for the residents within 10km radius from Fukushima Dai-ni NPS to stay in-house

17:00 TEPCO reported to NISA the event (Unusual increase of radiation

dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

17:39 Prime Minister directed evacuation of the residents within the 10 km radius from Fukushima-Dai-ni NPS

18:25 Prime Minister directed evacuation of the residents within the 20km radius from Fukushima Dai-ichi NPS

19:55 Directives from Prime Minister was issued regarding seawater injection to Unit No.1 of Fukushima Dai-ichi NPS.

20:05 Considering the Directives from Prime Minister and pursuant to the Paragraph 3, the Article 64 of the Nuclear Regulation Act, order was issued to inject seawater to Unit 1 of Fukushima Dai-ichi NPS.

20:20 At Unit 1 of Fukushima Dai-ichi NPS, seawater injection started.

(March 13th)

05:38 TEPCO reported to NISA the event (Total loss of coolant injection function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 3 of Fukushima Dai-ichi NPS. Recovering efforts by TEPCO of the power source and coolant injection function and work on venting are under way.

09:01 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

09:08 Pressure suppression in the Containment Vessel and fresh water injection started at Unit 3 of Fukushima Dai-ichi NPS.

09:20 The Pressure Vent Valve of Unit 3 of Fukushima Dai-ichi NPS was opened.

09:30 The order was issued for the Governor of Fukushima Prefecture, the Mayors of Okuma Town, Futaba Town, Tomioka Town and Namie Town in accordance with the Act on Special Measures Concerning Nuclear Emergency Preparedness on the contents of radioactivity decontamination screening.

09:38 TEPCO reported to NISA that Unit 1 of Fukushima Dai-ichi NPS reached a situation specified in the Article 15 of the Act on Special

Measures Concerning Nuclear Emergency Preparedness.

13:09 Tohoku Electric Power Co. reported to NISA that Onagawa NPS reached a situation specified in the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

13:12 Fresh water injection was switched to seawater injection at Unit 3 of Fukushima Dai-ichi NPS.

14:36 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 14th)

01:10 Seawater injection at Unit 1 and Unit 3 of Fukushima Dai-ichi NPS were temporarily interrupted due to the lack of seawater in pit.

03:20 Seawater injection at Unit 3 of Fukushima Dai-ichi NPS was restarted.

04:40 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

05:38 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

07:52 TEPCO reported to NISA the event (Unusual rise of the pressure in PCV) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 3 of Fukushima Dai-ichi NPS.

13:25 Regarding Unit 2 of Fukushima Dai-ichi NPS, TEPCO recognised the event (Loss of cooling function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

22:13 TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ni NPS.

22:35 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on

Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 15th)

00:00: The acceptance of experts from IAEA was decided. NISA agreed to accept the offer of dispatching of the expert on NPS damage from IAEA considering the intention by Mr. Amano, Director General of IAEA. Therefore, the schedule of expert acceptance will be planned from now on according to the situation.

00:00: NISA also decided the acceptance of experts dispatched from NRC.

07:21 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

07:24 Incorporated Administration Agency, Japan Atomic Energy Agency (JAEA) reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding, Nuclear Fuel Cycle Engineering Laboratories, Tokai Research and Development Centre.

07:44 JAEA reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Nuclear Science Research Institute.

08:54 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

10:30 According to the Nuclear Regulation Act, Minister of Economy, Trade and Industry issued the directives as follows.

For Unit 4: To extinguish fire and to prevent the occurrence of re-criticality

For Unit 2: To inject water to reactor vessel promptly and to vent Drywell.

10:59 Considering the possibility of lingering situation, it is decided that the function of the Local Emergency Response Headquarter is moved to the Fukushima Prefectural Office.

11:00 Prime Minister directed the in-house stay area.
In-house stay was additionally directed to the residents in the area from 20 km to 30 km radius from Fukushima Dai-ichi NPS considering in-reactor situation.

16:30 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

22:00 According to the Nuclear Regulation Act, Minister of Economy, Trade and Industry issued the following directive.
For Unit 4: To implement the injection of water to the Spent Fuel Storage Pool.

23:46 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

< Possibility on radiation exposure (As of 17:30 March 17th) >

<Exposure of residents>

(1) Including the evacuees from Futaba Public Welfare Hospital to Nihonmatsu City Fukushima Gender Equality Centre as the result of measurement of 133 persons at the Centre, 23 persons counted more than 13,000 cpm were decontaminated.

(2) The 35 residents transferred from Futaba Public Welfare Hospital to Kawamata Town Saiseikai Kawamata Hospital by private bus arranged by Fukushima Prefecture were judged to be not contaminated by the Prefectural Response Centre.

(3) As for the about 100 residents in Futaba Town evacuated by bus, the results of measurement for 9 of the 100 residents were as follows. The evacuees were divided into two groups which joined later to Nihonmatsu City Fukushima Gender Equality Centre.

No. of Counts	No. of Persons
18,000cpm	1

30,000-36,000cpm	1
40,000cpm	1
little less than 40,000cpm*	1
very small counts	5

*(These results were measured without shoes, though the first measurement exceeded 100,000cpm)

(4) The screening was started at the Off site Center in Okuma Town from March 12th to 15th. 162 people received examination until now. At the beginning, the reference value was set at 6,000cpm. 110 people were at the level below 6,000 cpm and 41 people were at the level of 6,000 cpm or more. When the reference value was increased to 13,000 cpm afterward, 8 people were at the level below 13,000 cpm and 3 people are at the level of 13,000 cpm or more.

The 5 out of 162 people examined were transported to hospital after being decontaminated.

(5) The Fukushima Prefecture carried out the evacuation of patients and personnel of the hospitals located within 10km area. The screening of all the members showed that 3 persons have the high counting rate. These members were transported to the secondary medical institute of exposure. As a result of the screening on 60 fire fighting personnel involved in the transportation activities, the radioactivity higher than twice of the back ground was detected on 3 members even after decontamination and all the 60 members were decontaminated.

<Exposure of workers>

(1) As for the 18 workers conducting operations in Fukushima Dai-ichi NPS, results of measurements are as follows;

One worker: 106.3 mSv. At the level of exposure no internal exposure and medical treatment was not required.

Other workers: No threat of internal exposure and no medical treatment needed.

(2) The 6 out of 7 people working at the time of explosion at the Unit 3 of Fukushima Dai-ichi NPS injured and were conscious. The detailed measurement data are not available.

<Others>

(1) Fukushima Prefecture has started the screening from 13 March at two health office in the prefecture. It is undertaken at 12 evacuation sites, 7 health offices, etc. The results of screening are being totalled up.

(2) 5 members of Self-Defence Force who worked for water supply in Fukushima Dai-ichi NPS were exposed. After the work (March 12th), 30,000 cpm was counted by the measurement at Off site Centre. The counts after decontamination were between 5,000 and 10,000 cpm. One member was transferred to National Institute of Radiological Science. No other exposure of the Self-Defence Force member was confirmed at the Ministry of Defence.

(3) As for policeman, the decontaminations of two policemen were confirmed by the National Police Agency. Nothing unusual was reported.

<Direction of administrating stable Iodine during evacuation>

On March 16th, the Local Emergency Response Headquarter issued "the direction to administer the stable Iodine during evacuation from the evacuation area (20 km radius)" to the Prefecture Governors and the heads of cities, towns and villages (Tomioka town, Hutaba town, Okuma town, Namie town, Kawauchi village, Naraha town, Minamisouma city, Tamura city, Kazurao village, Hirono town, Iwaki city and Iidate village).

<Situation of the injured (As of 17:30 March 17th)>

1. Injury due to earthquake
   - Two employees (slightly)
   - Two subcontract employees (one fracture in both legs)
   - Two missing (TEPCO's employee, missing in the turbine building of Unit 4)
   - One emergency patient (According to the local prefecture, one patient of cerebral infarction was transported by the ambulance).
   - Ambulance was requested for one employee complaining the pain at left chest outside of control area (conscious).

- Two employees complaining discomfort wearing full-face mask in the main control room were transported to the industrial doctor of Fukushima Dai-ni NPS.

2. Injury due to the explosion of Unit 1 of Fukushima Dai-ichi NPS
   - Four employees were injured at the explosion and smoke of Unit 1 around turbine building (out of control area) and were examined by Kawauchi clinic.
3. Injury due to the explosion of Unit 3 of Fukushima Dai-ichi NPS
   - Four TEPCO's employees
   - Three subcontractor employees
   - Four members of Self-Defence Force (one of them was transported to National Institute of Radiological Sciences considering internal possible exposure. The examination resulted in no internal exposure. The member was discharged from the institute on March 16th.)

<Situation of Resident Evacuation (As of 17:30 March 17th)>

At 11:00 March 15th, Prime Minister directed in-house stay to the residents in the area from 20 km to 30 km radius from Fukushima Dai-ichi NPS. The directive was conveyed to Fukushima Prefecture and related municipalities.

Regarding the evacuation as far as 20-km from Fukushima Dai-ichi NPS and 10-km from Fukushima Dai-ni, necessary measures have already been taken.

- The in-house stay in the area from 20 km to 30 km from Fukushima Dai-ichi NPS is made fully known to the residents concerned.
- Cooperating with Fukushima Prefecture, livelihood support to the residents in the in-house stay area are implemented.

(Contact Person)
Mr. Toshihiro Bannai
Director, International Affairs Office,
NISA/METI
Phone:+81-(0)3-3501-1087

From: Alter, Peter
Sent: Friday, March 18, 2011 3:24 PM
To: RST01 Hoc
Subject: FW: Japan reactor spent fuel storage update

I'll be there for 0700 - 1500 Saturday *PJAlter*

From: Dalzell-Bishop, Jennifer
Sent: Friday, March 18, 2011 1:59 PM
To: Alter, Peter
Cc: HOO Hoc
Subject: FW: Japan reactor update

FYI-not sure how reliable this is, but here is some info about Dry Casks at Daiichi that was forwarded to me.

Thanks,
Jennifer Dalzell-Bishop
Region III, Emergency Response Specialist
(630) 829-9607

From: Learn, Matthew
Sent: Friday, March 18, 2011 12:47 PM
To: Dalzell-Bishop, Jennifer
Subject: FW: Japan reactor update

From: Nicholson, John
Sent: Friday, March 18, 2011 12:47 PM
To: Learn, Matthew; Temps, Robert; Benner, Eric; Lipa, Christine
Subject: Japan reactor update

First article that I have seen with any reference to dry cask storage on site

http://www.world-nuclear-news.org/RS_Spraying_continues_at_Fukushima_Daiichi_1803111.html

last paragraph of article:

Central and dry fuel storage

Tokyo Electric Power Company has released the conclusions of a visual inspection of the power plant's central used fuel storage pond, where 60% of the total amount of used fuel is kept. Water levels there are 'secured'. A separate storage area where older fuel has been stored in dry casks since 1995 showed 'no signs of abnormal situation'. Detailed checks of both facilities are being prepared.

John Nicholson
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U.S. NRC, Region I
Division of Nuclear Materials Safety
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610-337-5236 (office)
610-337-5269 (fax)

PPPP/65

From: LIA06 Hoc
Sent: Friday, March 18, 2011 7:02 AM
To: Powell, Amy
Subject: OCA support of Japan event in the Ops Center

Amy,

I know you all are a small office with many other things going on, but we really need to have an OCA rep here during day shift on the weekdays and call in contact info for other times while this event is going on and the Ops Center is activated. The ET admin support team needs this information to feed the overall schedule.

Thanks for your help. Your folks have been very helpful.

Mark Lombard
Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

PPPP/66

From: LIA06 Hoc
Sent: Friday, March 18, 2011 10:09 PM
To: Weber, Michael
Subject: Japan Response - Communications

Mike,

Please send any emails for the Liaison Team to LIA06, not LIA05. LIA05 is the FEMA representative embedded with us.

Mark Thaggard
Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

PPPP/67

From: LIA04 Hoc
Sent: Friday, March 18, 2011 9:09 PM
To: Piccone, Josephine; Virgilio, Rosetta; Jackson, Deborah
Subject: FW: Recommendation for NRC Telecon (with DOE) with the States

Importance: High

FYI, I also sent this directly to Lombard and McGinty, in addition to the LT Director at LIA06.

Rich

From: LIA04 Hoc
Sent: Friday, March 18, 2011 8:34 PM
To: McGinty, Tim; Lombard, Mark
Subject: FW: Recommendation for NRC Telecon (with DOE) with the States
Importance: High

From: LIA04 Hoc
Sent: Friday, March 18, 2011 6:33 PM
To: LIA06 Hoc
Cc: Piccone, Josephine; Virgilio, Rosetta; Jackson, Deborah
Subject: Recommendation for NRC Telecon (with DOE) with the States
Importance: High

Mark Thaggard/Mark Lombard/Tim McGinty (Liaison Team Directors):

NRC's State Stakeholders have expressed a desire to hear directly, through a joint DOE/NRC teleconference, about the current status of issues resulting from the events in Japan. This meeting will need to be coordinated with Federal family members, particularly DOE and possibly EPA. This meeting should be led by one of the NRC ambassadors to keep the message(s) consistent. The States also wish to have an opportunity to have some of their questions and concerns heard and addressed. We recommend this request be presented to the ET.

FSME highly recommends such a meeting be organized:

- Other Federal agencies (HHS for one) has held such meetings both Nationally and at Regional levels in the U.S. and has received great feedback from those meetings; HHS is holding such another meeting at 5:00 pm tonight;

- The White House has held a regional meeting of West Coast States and Pacific Island Countries both on 3/17 and another to be held on 3/18; they have also proposed a meeting for All State Governors for 3/21 (not yet announced – close hold due to it possibly not happening);

- The added value from such a meeting should not be discounted; State stakeholders feel they are working in a vacuum at times, and such outreach and opportunity from the Federal family provides an outstanding opportunity for communication and provides a fine measure of good will.

PPPP/68

- There is concern that following this event (several weeks from now), our State stakeholders will reflect on, and will communicate to us, our having been pro-active in reaching out, or our not having made the effort.

3x per week possible.

Richard Turtil
State Liaison – Liaison Team
Incident Response Center

From: LIA06 Hoc
Sent: Friday, March 18, 2011 8:41 PM
To: Weber, Michael
Subject: RE: Japan Response - Congressional One-pager

Thanks – I tracked it down.

Mark Thaggard
Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

From: Weber, Michael
Sent: Friday, March 18, 2011 8:30 PM
To: LIA06 Hoc
Subject: Response - Japan Response - Congressional One-pager

Sure, Mark. I sent it to LIA05 at about 1900. You should be able to find it there or at LIA07. I also sent it to your LAN address. I thought this might help.

From: LIA06 Hoc
To: Weber, Michael
Sent: Fri Mar 18 19:22:26 2011
Subject: Japan Response - Congressional One-pager

Mike,

Amy Powell (OCA) thought that you had developed an outline for the one-pager that you asked the Liaison Team to develop for Congressional staffer. If you have developed an outline, please forward it to LIA06 hoc.

Mark Thaggard
Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

PPPP/69

From: LIA08 Hoc
Sent: Friday, March 18, 2011 2:32 AM
To: LIA06 Hoc
Subject: FW: Personnel protection strategies for SFP water delivery

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From: Hoc, PMT12
Sent: Friday, March 18, 2011 1:17 AM
To: LIA08 Hoc
Subject: Personnel protection strategies for SFP water delivery

Tom, information attached. FYI, we are watching live video of the water cannons spraying now on HNK.

1) Distance strategies:
   - If this can be done remotely, especially for the initial injection, then that may be preferable. It is possible that the steam plume on the initial injection will become a substantial shine dose source, and dose rates will change quickly and significantly. Crews may be able to set up the equipment, then withdraw before water is injected.
   - We are assuming that this activity will be set up on the west side of the site. We believe this is currently upwind, and wind should be blowing offshore (from the west) until Sunday morning their time.

2) Time strategies:
   - *If operations need to be manned continually, then pre-planned shuffling of personnel should be in place.*

3) Shielding strategies:
   - Respiratory protection and waterproofing should be in place.
   - Might consider dose from the ground as a significant contributor, especially very close to the site. It might be possible to lay thick metal plates to provide some shielding, dependent on the difference between the ground and general dose rates.

PPPP/7D

From: McIntyre, David
Sent: Friday, March 18, 2011 9:53 AM
To: LIA04 Hoc
Cc: Maier, Bill
Subject: RE: 10 mile EPZ and 50 mile evacuation zone in Japan

By all means, yes!

From: LIA04 Hoc
Sent: Friday, March 18, 2011 9:52 AM
To: McIntyre, David
Cc: Maier, Bill
Subject: FW: 10 mile EPZ and 50 mile evacuation zone in Japan
Importance: High

Dave,

Can this be sent to federal , State, and local government partners? We noticed that this particular bullet is in the approved 3/18 talking points. Bill Maier needs to know ASAP.

Thanks,
Cindy Flannery

From: LIA04 Hoc
Sent: Thursday, March 17, 2011 8:49 PM
To: Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; Maier, Bill; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena
Cc: Piccone, Josephine; LIA06 Hoc; OST05 Hoc; Harrington, Holly; Collins, Elmo; Dean, Bill; Heck, Jared; McCree, Victor; Pederson, Cynthia; Satorius, Mark; Flannery, Cindy; LIA04 Hoc; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michelle; Turtil, Richard; Virgilio, Rosetta
Subject: 10 mile EPZ and 50 mile evacuation zone in Japan
Importance: High

RSLOs:

Many of your states and others have inquired about the 10 mile EPZ and the 50 mile evacuation recommendation as stated in the NRC's press release of March 16 (No. 11-050), which states "the NRC believes it is appropriate for U.S. residents within 50 miles of the Fukushima reactors to evacuate."

The following has been provided by OPA on March 17 through its approved Talking Points.

- The 10-mile EPZ reflects the area where projected doses from design basis accidents at nuclear power plants would not exceed the EPA's protective action guidelines, and we are confident that it would be adequate even for severe accidents. However, the 10-mile zone was always considered a base for emergency response that could be expanded if the situation warranted. The situation in Japan, with four reactors experiencing exceptional difficulties simultaneously, creates the need to expand the EPZ beyond the normal 10-mile radius. We have said from the beginning of this crisis that the NRC would analyze this situation for any lessons that can be derived to improve our oversight of U.S. nuclear power plants. Emergency planning will be part of that review.

PPPP/71

Richard Turtil
State Liaison – Liaison Team
Incident Response Center

From: LIA08 Hoc
Sent: Friday, March 18, 2011 7:12 PM
To: LIA12 Hoc
Cc: LIA06 Hoc
Subject: FW: USNRC Earthquake-Tsunami Update - 1800 EDT (March 18, 2011)
Attachments: USNRC Earthquake-Tsunami Update.031811.1800EDT.pdf

This is the latest SIT-REP for the Congressional 1-pager.

From: LIA07 Hoc
Sent: Friday, March 18, 2011 6:37 PM
Subject: USNRC Earthquake-Tsunami Update - 1800 EDT (March 18, 2011)

Attached, please find an 1800 EDT March 18, 2011 status update from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami.

~~Please note that this information is "Official Use Only" and is only being shared within the federal family.~~

Please call the Headquarters Operations Officer at 301-816-5100 with questions.
-Sara

Sara K. Mroz
Communications and Outreach
Office of Nuclear Security and Incident Response
US Nuclear Regulatory Commission
Sara.Mroz@nrc.gov
LIA07.HOC@nrc.gov (Operations Center)

PPPP/72

From: ET05 Hoc
Sent: Monday, March 21, 2011 9:59 PM
To: Wiggins, Jim
Subject: March 21 2300EDT one pager (2).docx
Attachments: March 21 2300EDT one pager (2).docx

PPPP/73

From: PMT07 Hoc
Sent: Monday, March 21, 2011 7:18 PM
To: PMT03 Hoc
Subject: PMT Status Update 21 MAR.doc
Attachments: PMT Status Update 21 MAR.doc

PPPP/74

From:	LIA07 Hoc
To:	Borchardt, Bill; Bradford, Anna; Cohen, Shari; Cooper, LaToya; Dyer, Jim; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Taylor, Renee; Virgilio, Martin; Walls, Lorena; Weber, Michael
Subject:	One Pager Update for Go Book
Date:	Tuesday, March 22, 2011 10:37:11 PM
Attachments:	March 22 2200EDT one pager (2).docx

Attached please find the 2200 EDT "One Pager" for addition to the Go Books.

-Sara

PPPP/75

From: Morris, Scott
Sent: Tuesday, March 22, 2011 6:05 AM
To: ET05 Hoc
Subject: March 22 0600EDT one pager.docx
Attachments: March 22 0600EDT one pager.docx

Please print this for me

PPPP/76

From: ET05 Hoc
Sent: Tuesday, March 22, 2011 6:18 AM
To: Morris, Scott
Subject: March 22 0600EDT one pager.docx
Attachments: March 22 0600EDT one pager.docx

As you requested.

PPPP/77

From: OST01 HOC
Sent: Friday, April 29, 2011 2:23 PM
To: FOIA Response.hoc Resource
Subject: FW: Draft Japan One Pager 1500 EDT 4-29-11.docx
Attachments: Draft Japan One Pager 1500 EDT 4-29-11.docx

From: Hoc, PMT12
Sent: Friday, April 29, 2011 1:56 PM
To: OST01 HOC
Subject: Draft Japan One Pager 1500 EDT 4-29-11.docx

PMT changes in red.

PPPP/78

From: Sheron, Brian
To: Case, Michael; Richards, Stuart; Hogan, Rosemary; Kammerer, Annie
Subject: FW: tsunami hazard studies from TEPCO experts (2 of 2)
Date: Tuesday, March 22, 2011 9:07:48 AM
Attachments: 09b-TSakai-Tsunami.ppt

From: Adams, Ian [mailto:Ian.Adams@Hq.Doe.Gov]
Sent: Tuesday, March 22, 2011 9:03 AM
To: Adams, Ian; Aoki, Steven; Binkley, Steve; Bob Budnitz; Sheron, Brian; Brinkman, Bill; DAgostino, Thomas; Dick Garwin; Dick Garwin; Finck, Phillip; Grossenbacher, John (INL); Hurlbut, Brandon; John Holdren; Kelly, John E (NE); Koonin, Steven; Lyons, Peter; McFarlane, Harold; Owens, Missy; Per Peterson; Poneman, Daniel; Rolando Szilard; Steve Fetter
Subject: FW: tsunami hazard studies from TEPCO experts (2 of 2)

Attached is the 2nd of 2 files sent to the nuclear group via Bob Budnitz.

Thanks,
Ian

From: Bob Budnitz [mailto:rjbudnitz@lbl.gov]
Sent: Tuesday, March 22, 2011 6:17 AM
To: Adams, Ian
Subject: tsunami hazard studies from TEPCO experts (2 of 2)

TO: Ian Adams
FROM: Robert Budnitz (LBNL)

TSUNAMI HAZARD STUDIES FOR JAPAN AND SPECIFICALLY FOR FUKUSHIMA
[Ian, can you please distribute this to the science group? Thanks. Bob]

SENDING THE MAIN FILE NEXT. SEPARATE EMAIL NEEDED DUE TO FILE SIZE

Dear Colleagues,

Dr. Antonio Godoy, a long-standing colleague and friend of mine, retired a few months ago from a post at the IAEA in Vienna were he was responsible for the program in seismic and tsunami hazards. In an email that I just received, and responding to my inquiry, Godoy explained to me that in May 2010 he sponsored an IAEA "Experts Meeting regarding the Site Selection and Evaluation for Philippines NPP" in Vienna. Two presentations at that meeting are directly relevant to the tsunami hazard at Fukushima, and the view graphs from both are attached here. Both are from experts at TEPCO, Drs. Takao and Sakai.

One of these presentations gives a general methodology overview, while the other is "Appendix A" and uses Fukushima as a case study.

There is a lot of jargon in these viewgraphs, which I am intimately familiar with but which

some of our group may not be familiar with. Oh well .....

I will try to see if any original papers exist to back up these slides, and if so whether they are available.

By the way, since his retirement Godoy has been rehired by the IAEA part-time, but has also set up a consulting practice in Vienna and in fact has done a small piece of consulting work for me at LBNL recently. He is also very close professionally to Annie Kammerer of the NRC staff, one of NRC's top seismic experts.

Bob Budnitz

Attachment 09b-TSakai-Tsunami_1.ppt (6711296 Bytes) cannot be converted to PDF format.

From: LIA07 Hoc
To: Borchardt, Bill; Bradford, Anna; Cohen, Shari; Cooper, LaToya; Dyer, Jim; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Taylor, Renee; Virgilio, Martin; Walls, Lorena; Weber, Michael
Subject: Go Book - One Pager
Date: Wednesday, March 23, 2011 3:24:14 PM
Attachments: March 23 1500EDT one pager.docx

Attached is the 1500 EDT March 23, 2011 "One Pager" for your reference.
-Sara

PPPP 80

From: LIA02 Hoc
Sent: Wednesday, March 23, 2011 5:24 AM
To: RST01 Hoc; PMT01 Hoc; Hoc, PMT12
Subject: FW: [METI Japan](Mar_22)Update on Seismic and Tsunami Damage Information(2/2)
Attachments: Mar_21_Tohoku Pacific Earthquake and the seismic damage to the NPPs.pdf

-----Original Message-----
From: Shaffer, Mark R [mailto:ShafferMr@state.gov]
Sent: Wednesday, March 23, 2011 5:23 AM
To: LIA02 Hoc; LIA03 Hoc
Subject: FW: [METI Japan](Mar_22)Update on Seismic and Tsunami Damage Information(2/2)

Attached is the presentation given by the Japanese representatives (from METI and NISA) during the technical Briefing on Monday.

This email is UNCLASSIFIED

PPPP/81

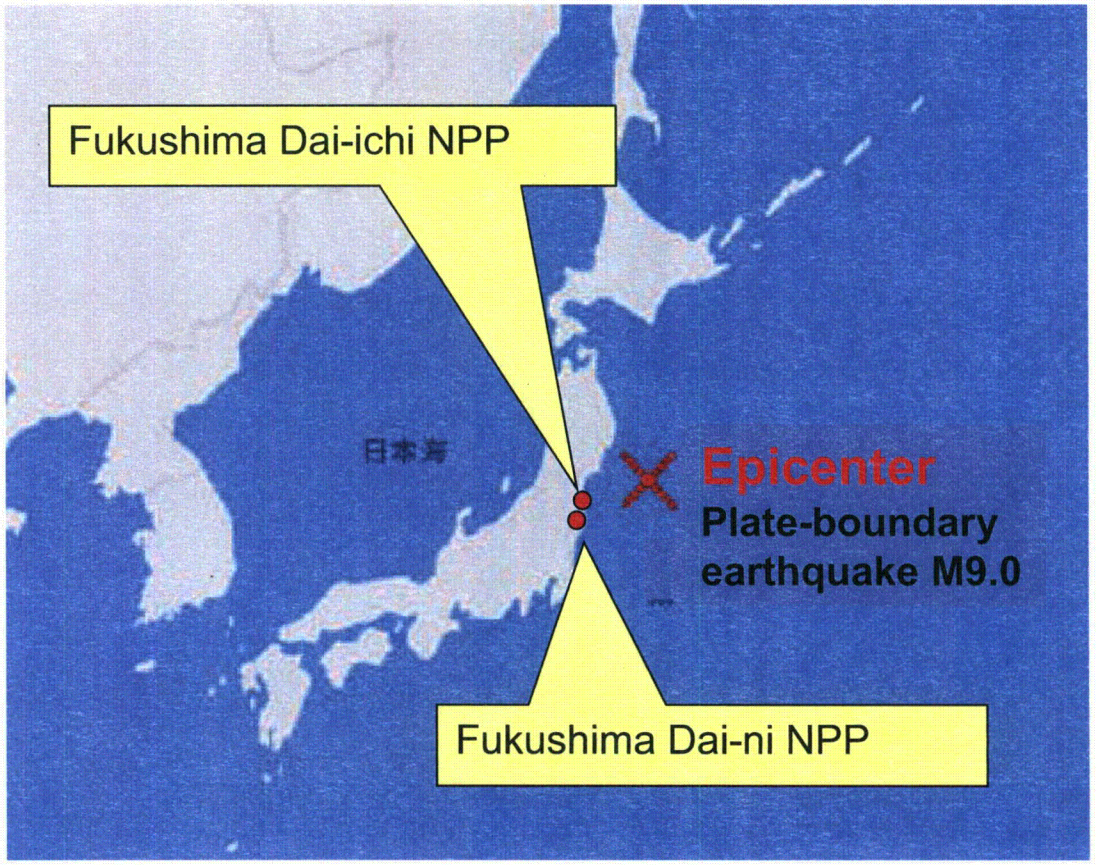
Tohoku Pacific Earthquake and the seismic damage to the NPPs

21 March 2011

Nuclear and Industrial Safety Agency
Japan

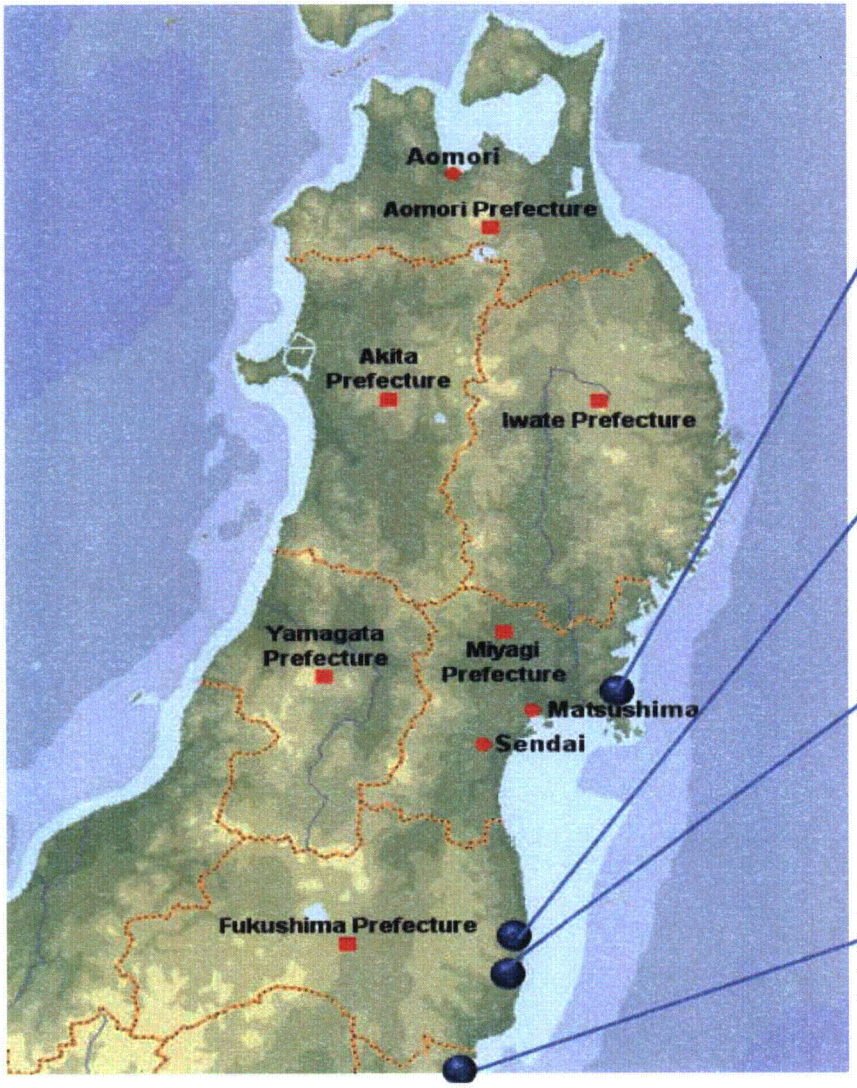
The 2011 off the Tohoku Pacific Earthquake (March 11, 2011)

- Occurred 14:46 March 11, 2011
- Magnitude:9.0 (on the JMA scale)
- Epicenter location:
  38° 6"N and 142° 51"E,
  and 24km in depth



1-1. Earthquake occurrence and automatic shut-down of nuclear reactors

Location of the Nuclear Installations



Onagawa
- Unit1: 524 MW, 1984-
- Unit2: 825 MW, 1995-
- Unit3: 825 MW, 2002-

Fukushima Ⅰ
- Unit1: 460 MW, 1971-
- Unit2: 784 MW, 1974-
- Unit3: 784 MW, 1976-
- Unit4: 784 MW, 1978-
- Unit5: 784 MW, 1978-
- Unit6: 1,100 MW, 1979-

Fukushima Ⅱ
- Unit1: 1,100 MW, 1982-
- Unit2: 1,100 MW, 1984-
- Unit3: 1,100 MW, 1985-
- Unit4: 1,100 MW, 1987-

Tokai Ⅱ (1,100 MW, 1978-)

1-2. Earthquake occurrence and automatic shut-down of nuclear reactors

●11 reactors were automatically shut-down

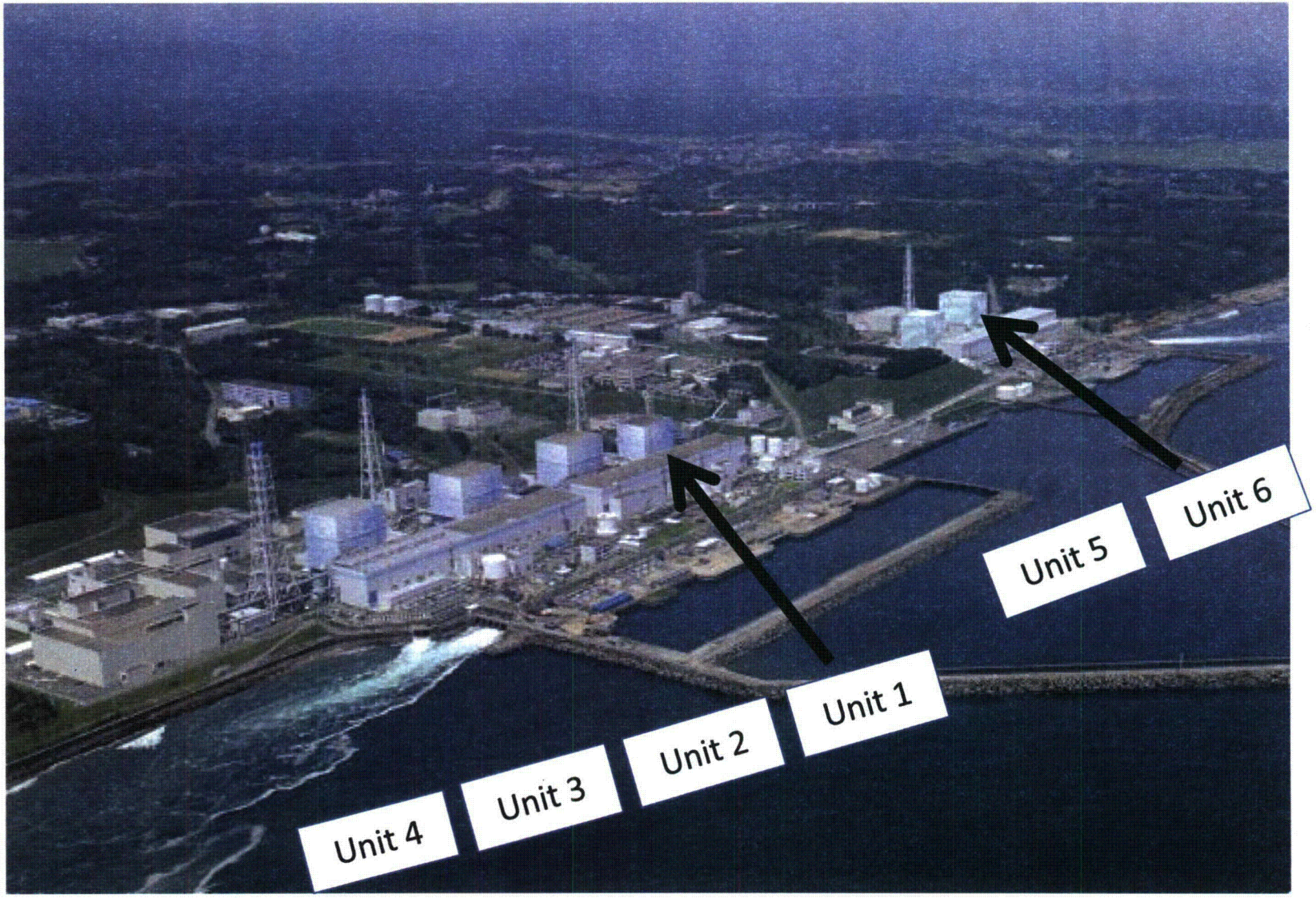
- Onagawa Unit 1,2,3
- Fukushima Dai-ichi (I) Unit 1,2,3
- Fukushima-Dai-ni (II) Unit 1,2,3,4
- Tokai Dai-ni (II)

●3 reactors were under periodic inspection

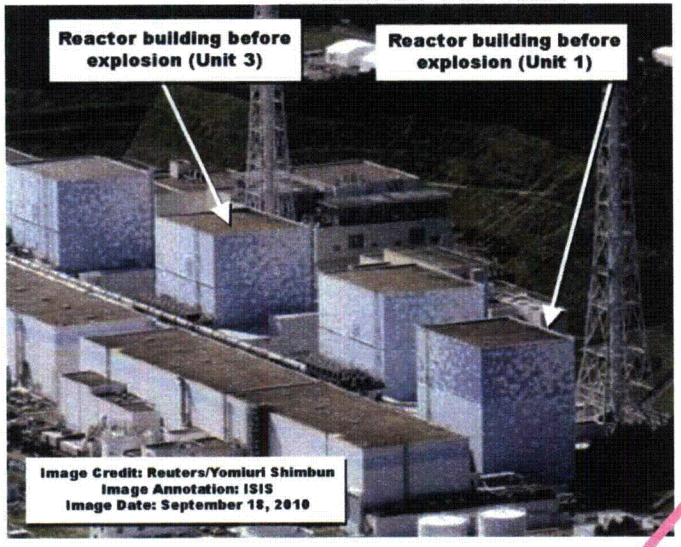
- Fukushima Dai-ichi (I) Unit 4,5,6

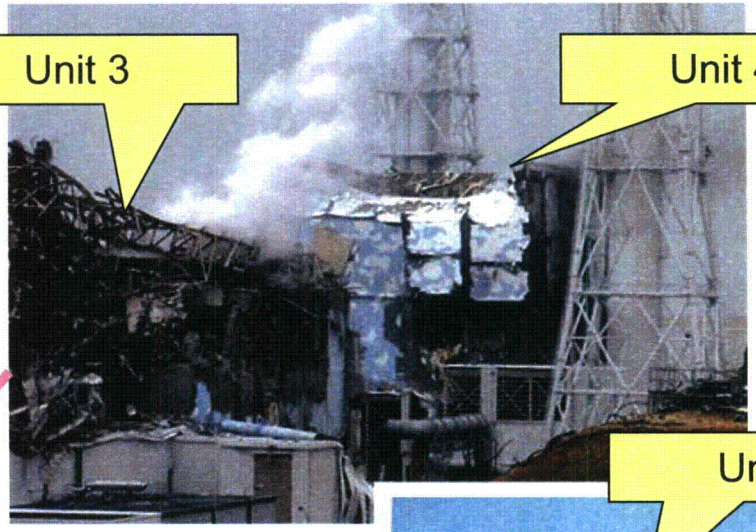
- After the automatic shut-down, the Unit 1-3 at Onagawa Nuclear Power Station, the Unit 3 at Fukushima II Nuclear Power Station, and the Unit at Tokai II Nuclear Power Station have been cold shut down safely.
- As for the unit 1,2,4 at Fukushima II Nuclear Power Station the operator of the station reported NISA nuclear emergency situation, because the temperature of the suppression pools became more than 100 ℃, but afterward the three units have been cold shut down.

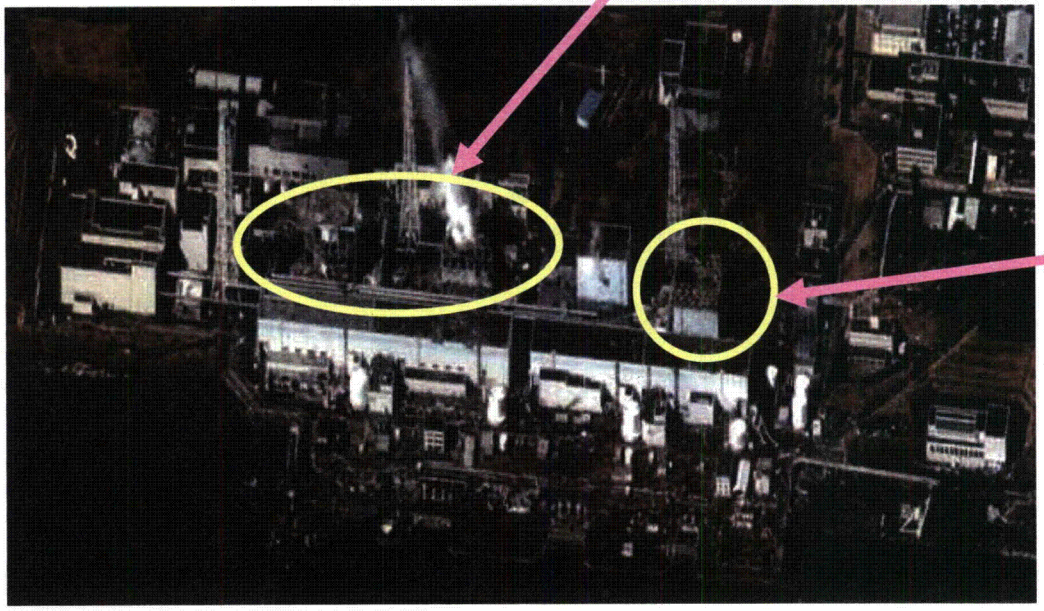
2-1. Outline of the Fukushima Dai-ichi (I) Nuclear Power Station

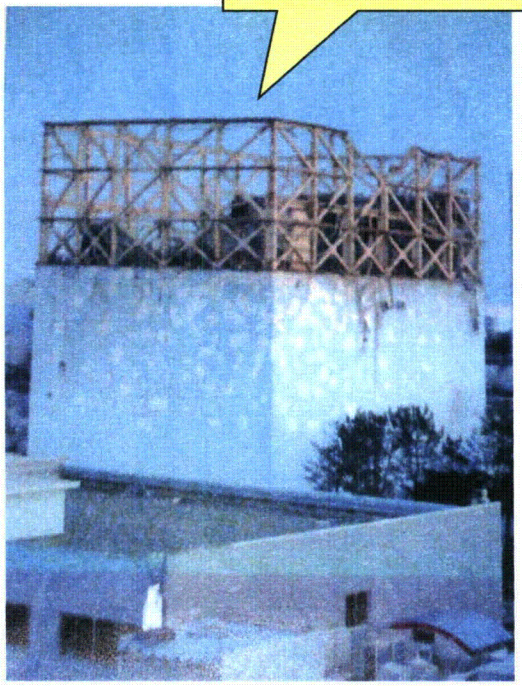


Damages of Fukushima Dai-ichi NPS

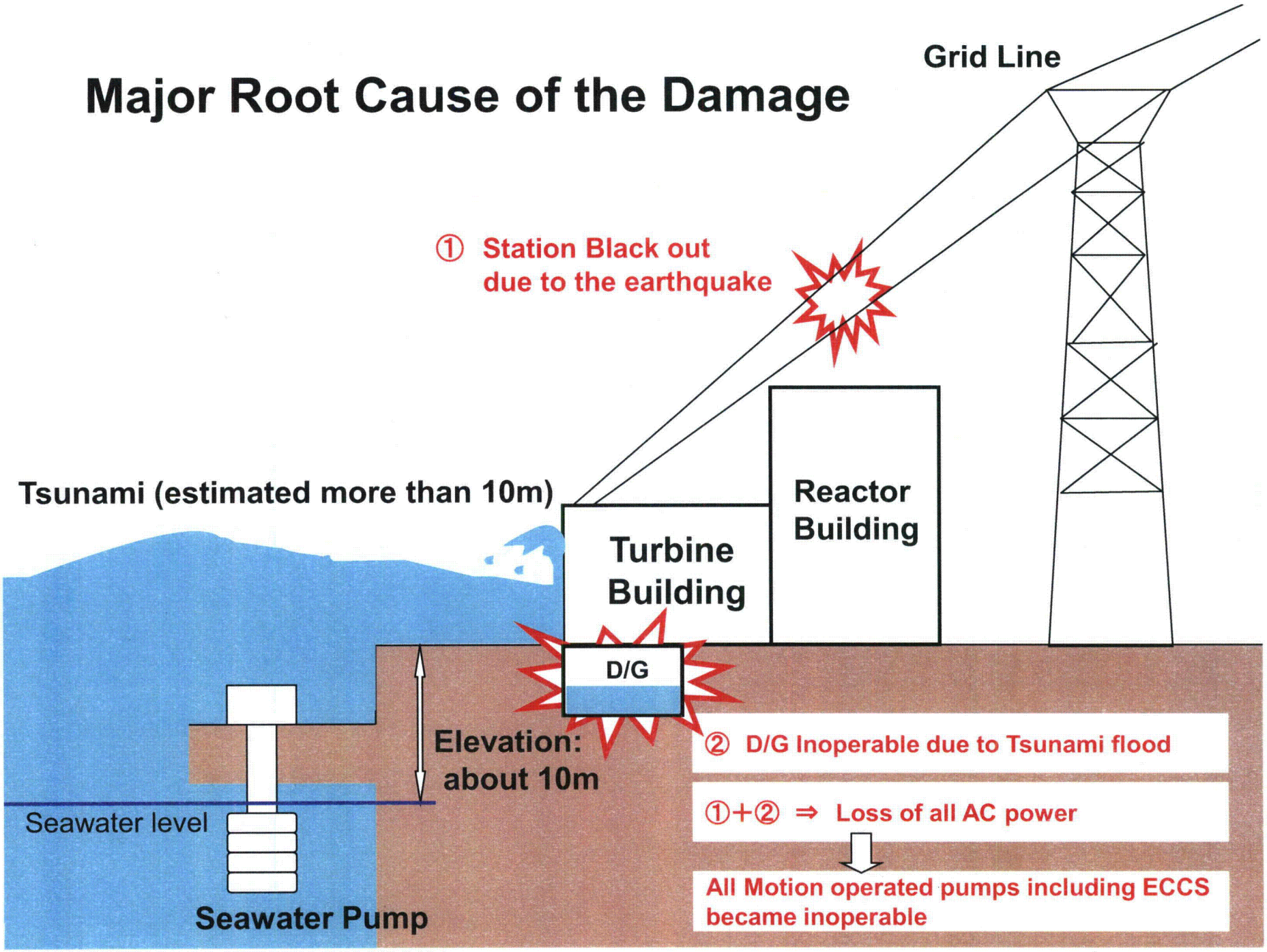








Major Root Cause of the Damage



3-1. Report concerning incidents at Unit1, 2, 3 and 4 at the Fukushima Dai-ichi (I) NPS

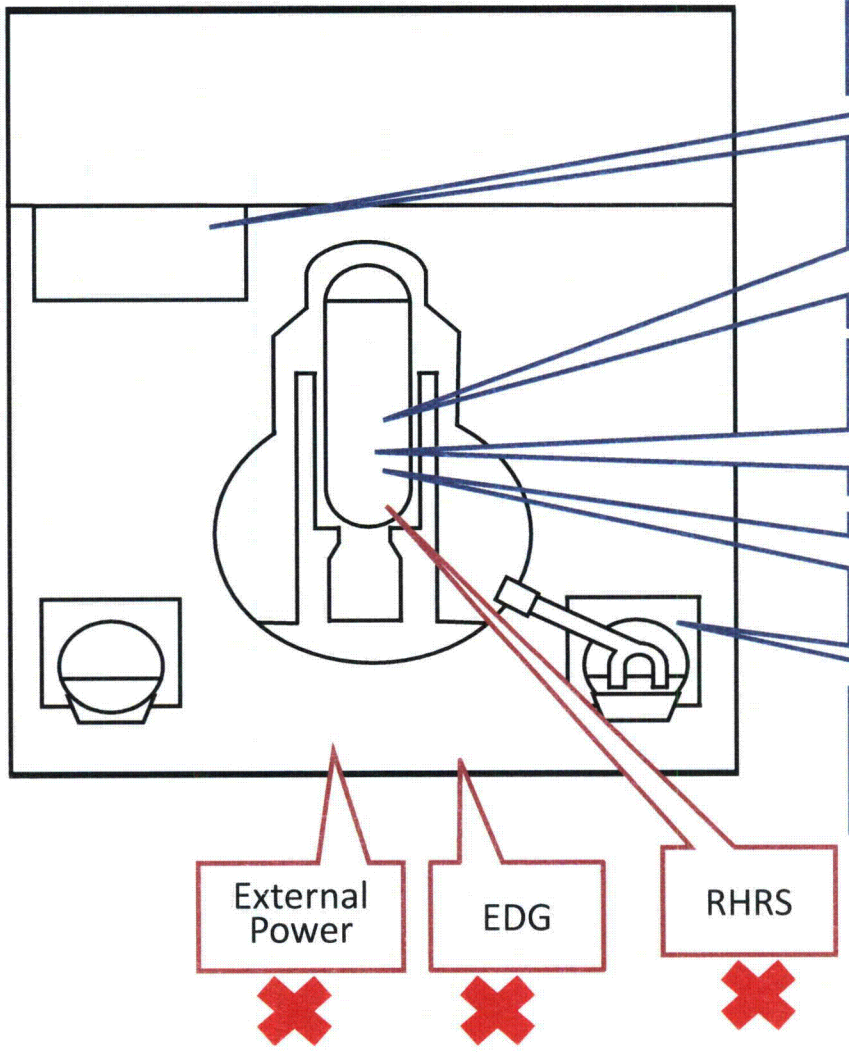
● *Unit 1 Seawater is being injected into the reactor pressure vessel as of 15:30 March 21th.*

- On March 11th, after the automatic shut-down of the reactor, the temperature of the reactor core went up, because the seawater pump which is necessary to operate cooling systems lost its water supply function due to the devastating Tsunami.

- On March 12th, water levels inside the pressure vessel dropped and the reaction of cladding metal of fuel and water generated hydrogen. The hydrogen leaked outside of the containment vessel and caused the explosion at the upper-part of a concrete building housing at 15:36 on March 12,

- Currently, seawater is being injected into the reactor pressure vessel(12:00 March 19th). There is no risk of a hydrogen explosion in the containment vessel because there is no oxygen in it. There is no high probability of leaking large amount of radioactive material currently.

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 1
(As of 15:30 March 21th, 2011)



Spent Fuel Pool Water Temperature — ℃
Condition: No data available

Reactor Water Level A -1750 mm
Reactor Water Level B -1750 mm
Condition: No flooding of top of active fuel until the above level

Reactor Pressure A 0.297 MPa
Reactor Pressure B 0.265 MPa
Condition : No large fluctuation

Reactor Water Temperature — ℃
Condition: No data available

S/P Water Temperature — ℃
Condition : No data available
S/P Pressure 0.16MPa

Time of measurement: 08:00 March 21th

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 1
(As of 15:30 March 21th, 2011)

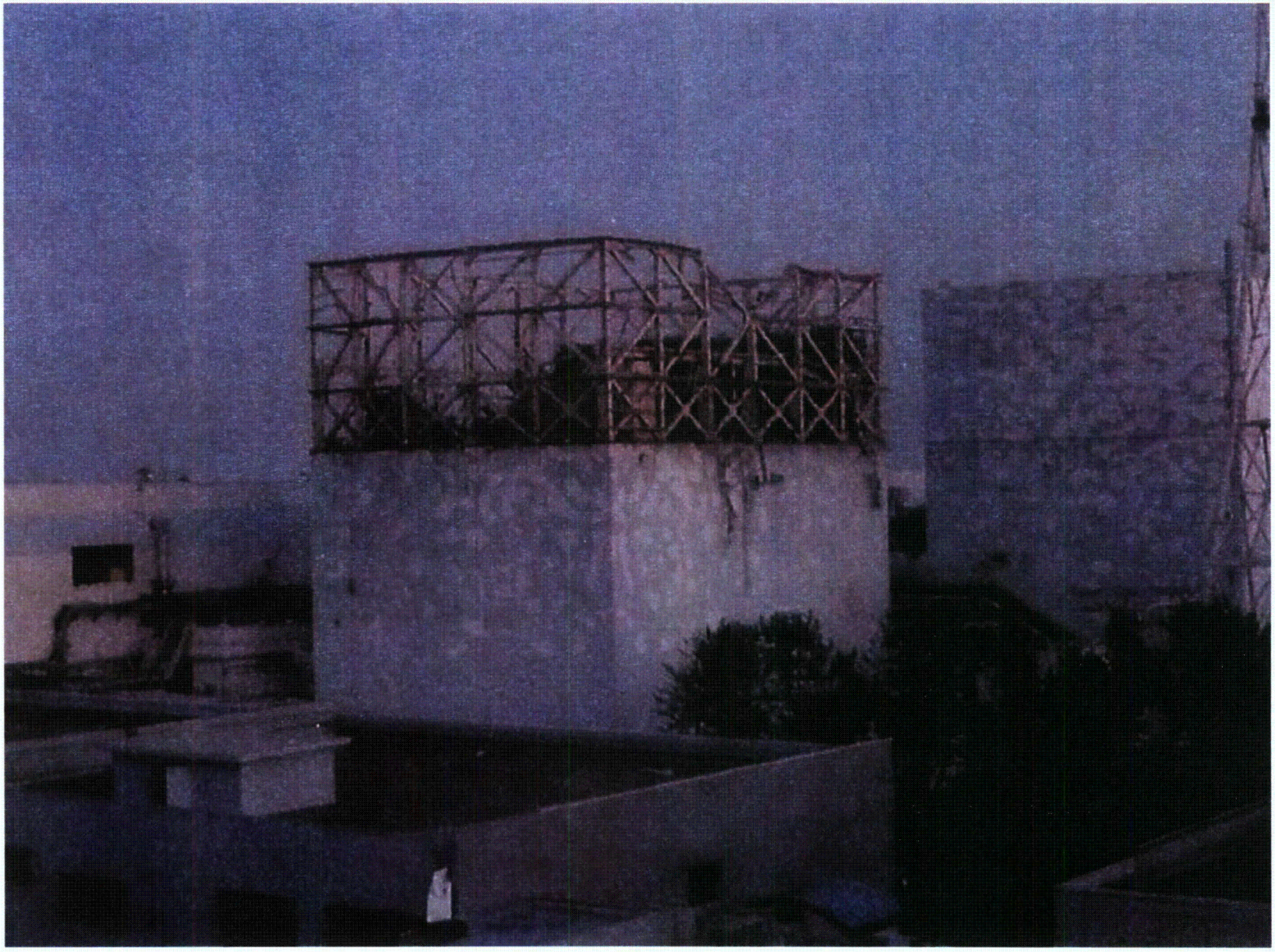
Major Events after the earthquake

11th 14:46 Under operation, Automatic shutdown by the earthquake
11th 15:42 Report of the Article 10 (loss of A/C power)
11th 16:36 Occurrence of the Article 15 event
(Loss of water injection function)
12th 0:49 Occurrence of the Article 15 event
(unusual increase of PCV pressure)
12th 14:30 Start to vent
12th 15:36 Sound of explosion
12th 20:20 Start of injection of seawater and borated water to the core

Current Conditions : Seawater is being injected

Future Operation : Recovering of power supply and continuous injection of seawater to core. Monitoring of water temperature in the pool and so on.

Fukushima Dai-ichi Unit 1 (airborne picture: TEPCO)



Fukushima Dai-ichi Unit 1 (airborne picture: TEPCO)

3-2. Report concerning incidents at Unit1, 2, 3 and 4 at the Fukushima Dai-ichi (I) NPS

● *Unit 2* ***Seawater is being injected into the reactor pressure vessel as of 15:30 March 21th.***

- After the automatic shut-down of the reactor, the water injection function was sustained, but the reactor water level tended to decrease.

- At 6:10 on March 15th, TEPCO reported that there was an explosion sound at Unit 2. Given the fact that the pressure in the suppression chamber of Unit 2 decreased. It is presumed that the possibility of certain damage on the suppression chamber.

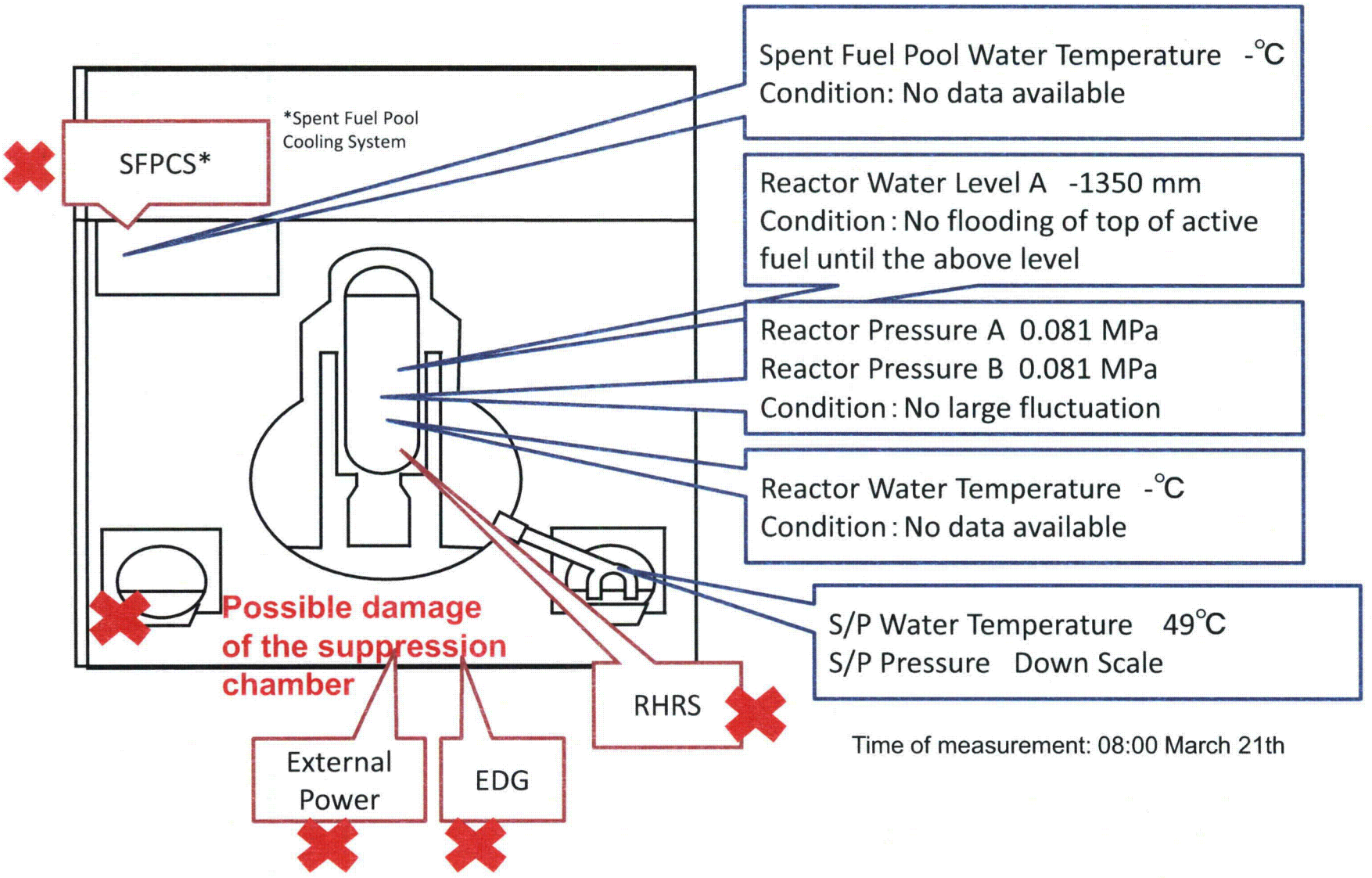
-Currently, seawater is being injected into the reactor pressure vessel. White smoke is running from reactor building through blowout panel.

-Access to the substation for reserve power supply from external transmission line was completed. The work for laying the electric cable from the facility to the load side was carried out.(as of 13:30 March 19th)

-Injection of 40 tons of seawater to the spent fuel pool of Unit 2 was started.(from 15:00 till 17:20 March 20th)

-Power center of Unit 2 received electricity (15:46 March 20th)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 2
(As of 15:30 March 21th, 2011)



Time of measurement: 08:00 March 21th

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 2
(As of 15:30 March 21th, 2011)

Major Events after the earthquake

11th 14:46 Under operation, Automatic shutdown by the earthquake
11th 15:42 Report of the Article 10 (loss of A/C power)
11th 16:36 Occurrence of the Article 15 event (Loss of water injection function)
14th 13:25 Occurrence of the Article 15 event (Loss of water cooling function)
14th 22:50 Occurrence of the Article 15 event (unusual increase of PCV pressure)
15th 6:10 Sound of explosion
15th about 6:20 Possible damage of the suppression chamber
20th 15:00-17:20 Injection of about 40 tons of seawater into SFP through fire extinguishing system.

Current Conditions : Seawater is being injected

Future Operation : Recovering of power supply and continuous injection of seawater to core. Monitoring of water temperature in the pool and so on.

3-3. Report concerning incidents at Unit1, 2, 3 and 4 at the Fukushima Dai-ichi (I) NPS

●Unit 3 *Several counter measures are being used to cool down Unit 3 as of 15:30 March 21.*

-After the automatic shut-down of the reactor, on March 13th fresh water and subsequently seawater were injected into the reactor pressure vessel through the fire extinguishing system line.

- The explosion took place around the reactor building of Unit 3 at 11:01 on March 14th.

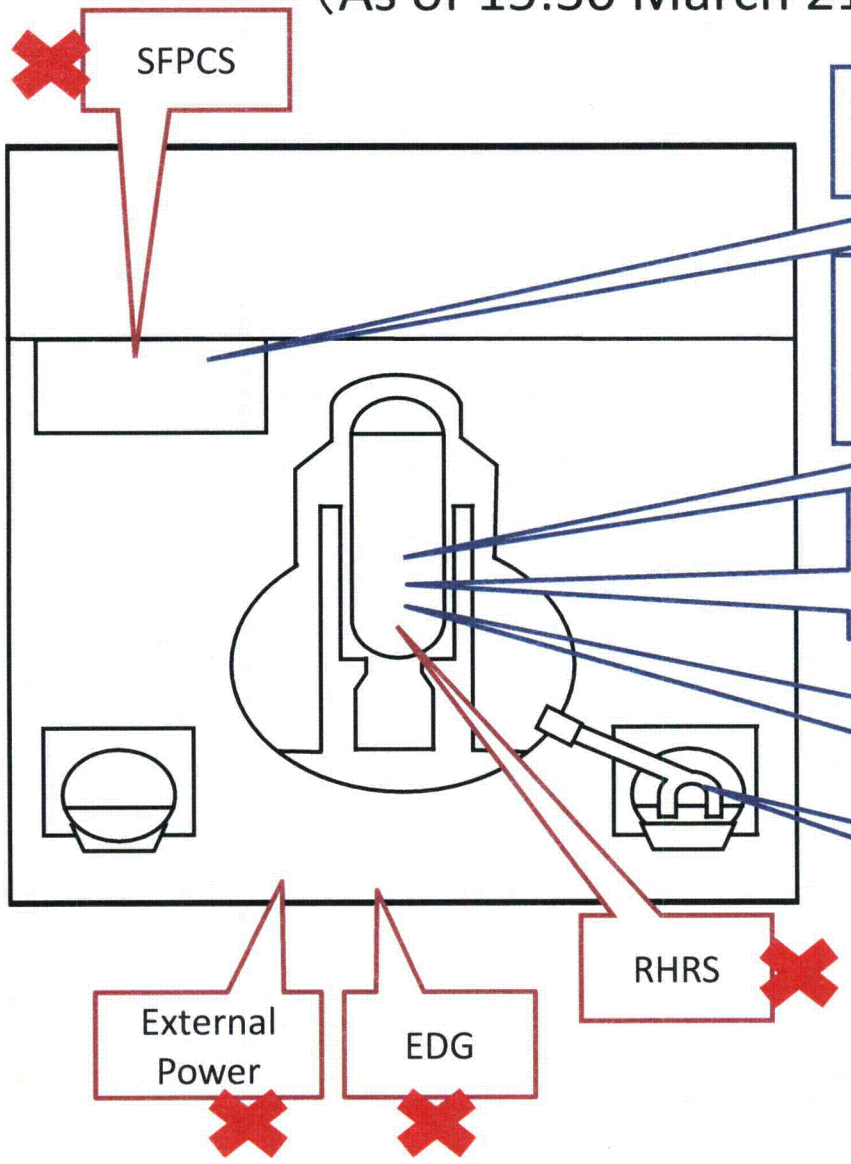
- At 8:30 on March 16th, white smoke like steam was generated from Unit 3. The operators evacuated from the central control room of Unit 3 and 4 at 10:45 on March 16th. Thereafter, the operators returned to the room and restarted the operation for water injection into the reactor pressure vessel at 11:30 on March 16th.

- Helicopters and water cannon trucks of Self Defense Forces discharged water to Unit 3 from sky and ground on March 17th. Riot police also shot water from ground. Currently, seawater is being injected into the reactor pressure vessel.

- Hyper Rescue Unit (14 vehicles) arrived at the Main Gate (23:10 March 18th) and 6 vehicles of them entered the NPS in order to spray water from the ground. (23:30 March 18th)

-Hyper Rescue Unit of Tokyo Fire Department carried out and completed water spray. (finished at 03:40 March 20th). The next spray was started at 21:39 March 20th and finished at 03:58 March 21st.
-The pressure in PCV rose (320kPa as of 11:00 March 20th) and monitoring the pressure continues (120kPa at 12:15 March 21st).

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 3
(As of 15:30 March 21th, 2011)



Spent Fuel Pool Water Temperature -℃
Condition : No data available

Reactor Water Level A -1600 mm
Reactor Water Level B -2000 mm
Condition : No flooding of top of active fuel until the above level

Reactor Pressure A 0.018 MPa
Reactor Pressure B 0.144 MPa
Condition : No Large Fluctuation

Reactor Water Temperature - ℃
Condition : No data available

S/P Water Temperature - ℃
Condition : No data available
S/P Pressure Down Scale

Time of measurement: 12:15 March 21th

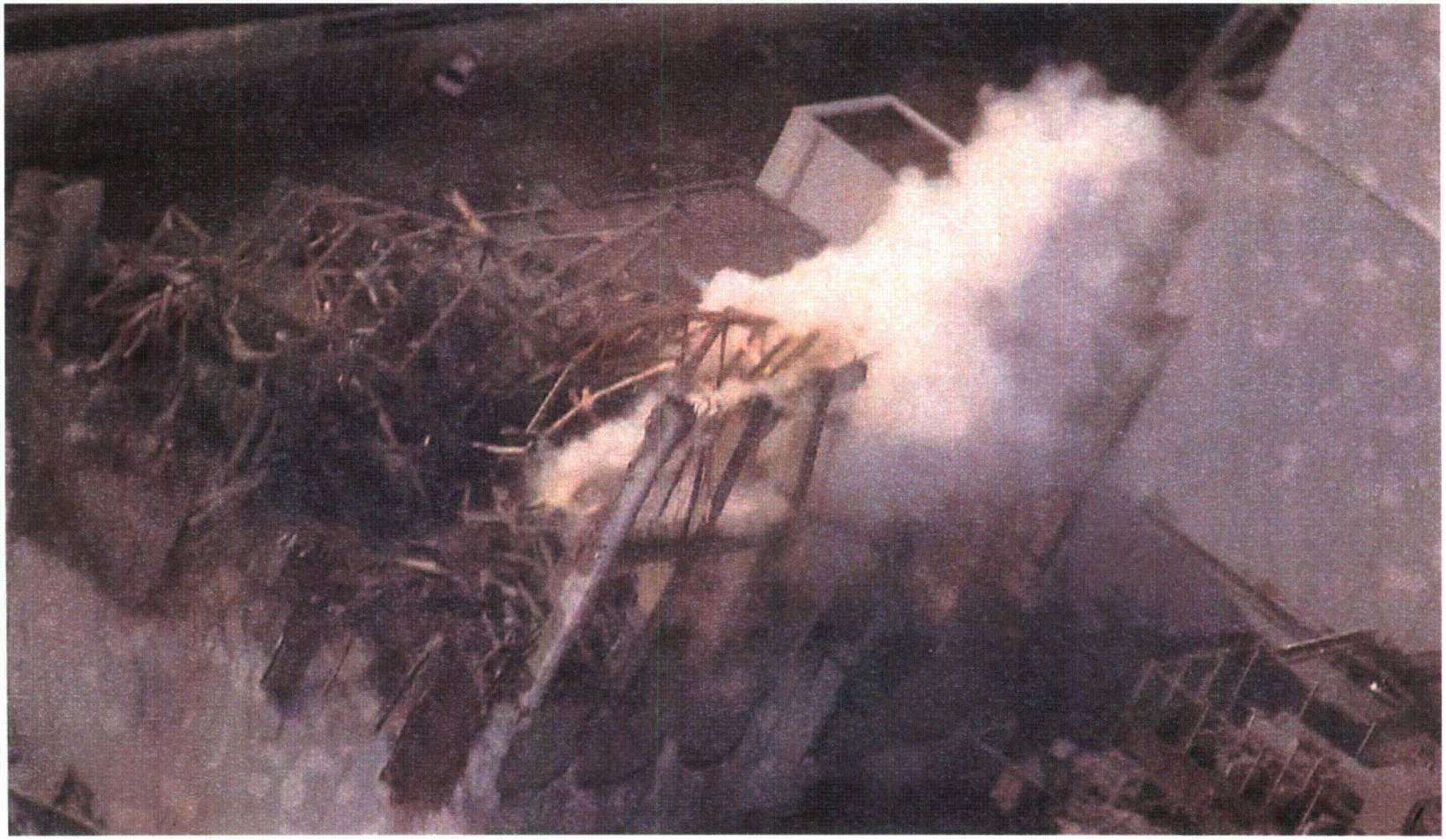
Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 3
(As of 15:30 March 21th, 2011)

Major Events after the earthquake

11th 14:46 Under operation, Automatic shutdown by the earthquake
11th 15:42 Report of the Article 10 (loss of A/C power)
13th 5:10 Occurrence of the Article 15 event (Loss of water injection function)
13th 8:10 Start to bent
14th 7:44 Occurrence of the Article 15 event (unusual increase of PCV pressure)
11:01 Sound of explosion
16th about 8:30 White smoke generated
17th 9:48 - 10:01 Water discharge by the helicopters of Self-Defense Force(4 times)
19:05 - 20:09 Water spray from the ground by High pressure water-cannon trucks (Police: once, Self-Defense Force: 5 times)
18th before 14:00- 14:38 Water spray from the ground by same trucks (Self-Defense Force : 6 times)
- 14:45 Water spray from the ground by US water-cannon trucks (US armed force : 1 time)
19th -03:40 Water spray from the ground by High pressure water-cannon trucks by Hyper Rescue Unit of Tokyo Fire Department.
20th 21:39 - 21th 03:58 Sprayed by Hyper Rescue Unit of Tokyo Fire Department.

Current Conditions : Continuous operations for water spray to the pool and seawater injection to the Reactor Core. Working on recovering power supply.

Future Operation : Recovering of power supply and continuous injection of seawater to core.



Fukushima Dai-ichi Unit 3 (airborne imagery: TEPCO)

3-4. Report concerning incidents at Unit1, 2, 3 and 4 at the Fukushima Dai-ichi (I) NPS

● *Unit 1,2 &3*

-As Cesium and Iodine were detected, it was believed that a part of nuclear fuel was damaged and a small amount of radioactive material was leaked into core cooling water.

3-5. Report concerning incidents at Unit1, 2, 3 and 4 at the Fukushima Dai-ichi (I) NPS

● ***Unit 4 There are no fuel in the reactor pressure vessel due to replacement work of a shroud.***

- It was confirmed that a part of wall of the operation floor of the reactor building of Unit 4 was damaged on March 15th. A fire took place at Unit 4 at 9:38 on March 15th, but the fire was extinguished spontaneously.

- At 5:45 on March 16th, it was reported that a fire occurred at Unit 4; however, no fire was confirmed by TEPCO staff on the ground at 6:15 on March 16th.

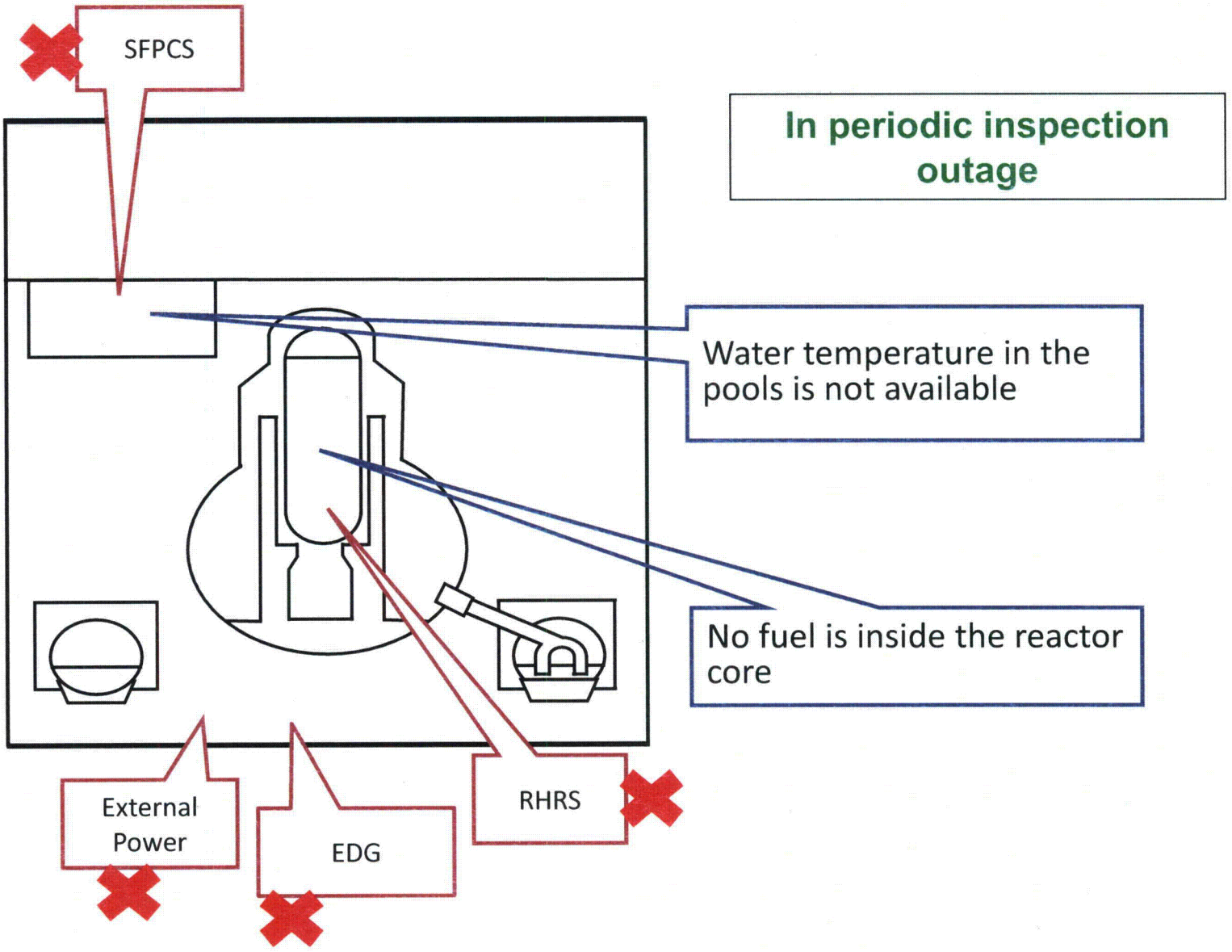
-The temperature of water in the spent fuel storage pool went up.

-Water spray over the spent fuel pool by Self Defence Force was started at around 18:30 March 20th and finished at 19:46 March 20th.

-Water spray over the spent fuel pool by Self Defence Force (13 fire engines) started at 06:37 March 21st and finished at 08:41 March 21st.

-The work for laying the electric cable to the power center has been completed. (around 15:00 March 21th)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 4
(As of 15:30 March 21th, 2011)



Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 4
(As of 15:30 March 21th, 2011)

Major events after the earthquake

In periodic inspection outage when the earthquake occurred.

14th 4:08 Water temperature in the Spent Fuel Pool, 84℃
15th 6:14 Damage of wall in the 4th floor confirmed
15th 9:38 Fire occurred in the 3rd floor (12:25 extinguished)
16th 5:45 Fire occurred. TEPCO couldn't confirm any fire on the ground. (7:26 extinguished)
20th around18:30-19:46 Water spray over the spent fuel pool by Self Defence Force
21th h 06:37-08:41 Water spray over the spent fuel pool by Self Defence Force

Current Conditions : No fuel is in the RPV. Water is evaluated to remain in the Pool (TEPCO)

Future Operation : Recovery of power supply

Fukushima Dai-ichi Unit 4 (airborne imagery: TEPCO)

Fukushima Dai-ichi Unit 4, operation floor (airborne imagery: TEPCO)

4. Report concerning incidents at Unit5 and 6 at the Fukushima Dai-ichi (I) NPS

● *Back up power of Unit 6 is in working condition and external power was supplied to Unit 5 as of March 21th*

-Fresh water is being injected into reactor pressure vessels and spent fuel pools by Make-Up Water Condensate system.

- Emergency Diesel Generator (1 unit) for Unit 6 is operable and supplying electricity to Units 5 and 6. Water injection to the PRV and Spent Fuel Pool through MUWC is progressing.

- The second unit of Emergency Diesel Generator (A) for Unit 6 has started up.

-Pump for Residual Heat Removal (RHR)(C) for Unit 5 (05:00 March 19th) and RHR(B) for Unit 6 (22:14 March 19th) started up and cooling of Spent Fuel Storage Pool has started. (Power supply : Emergency Diesel Generator for Unit 6)

-Unit 5 under cold shut down(14:30 March 20th)

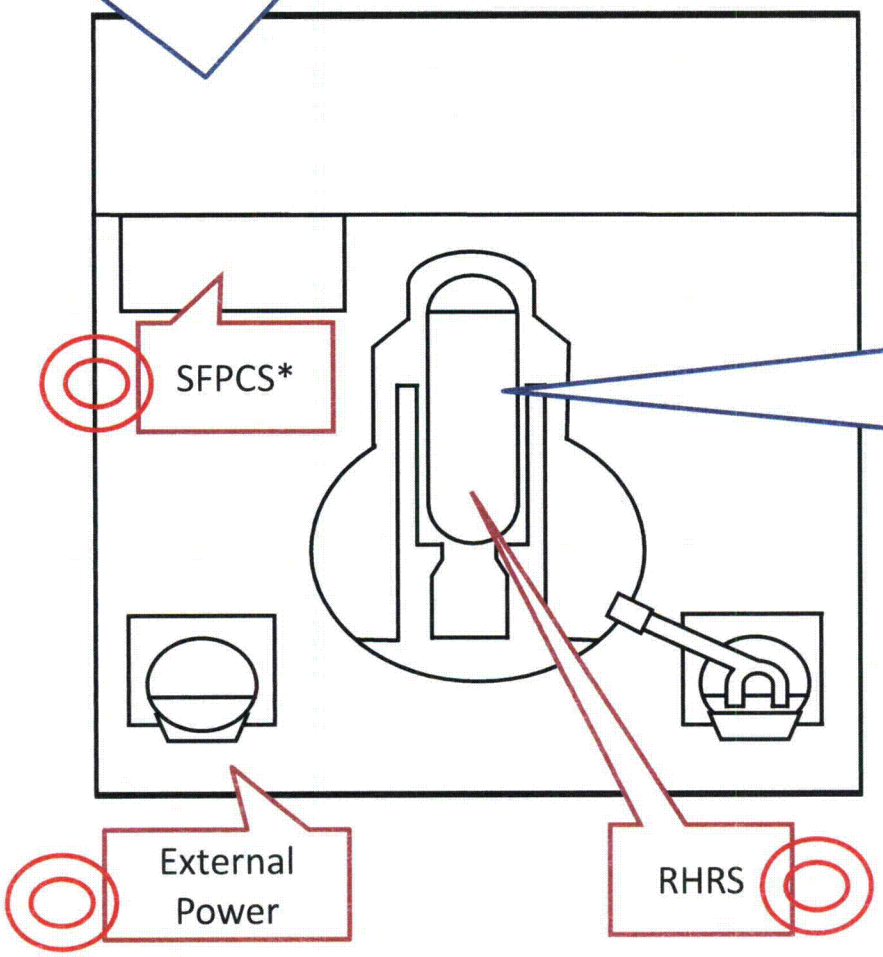
-Unit 6 under cold shut down(19:27 March 20th)

-Unit 5 is supplied electricity by external power. (Changed from EDG of Unit6 at 11:36 March 21th)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 5
(As of 15:30 March 21th, 2011)

Water Temperature in the Pool: 42.2℃
Condition: Spent fuel pool cooling function has been recovered.

In periodic inspection outage



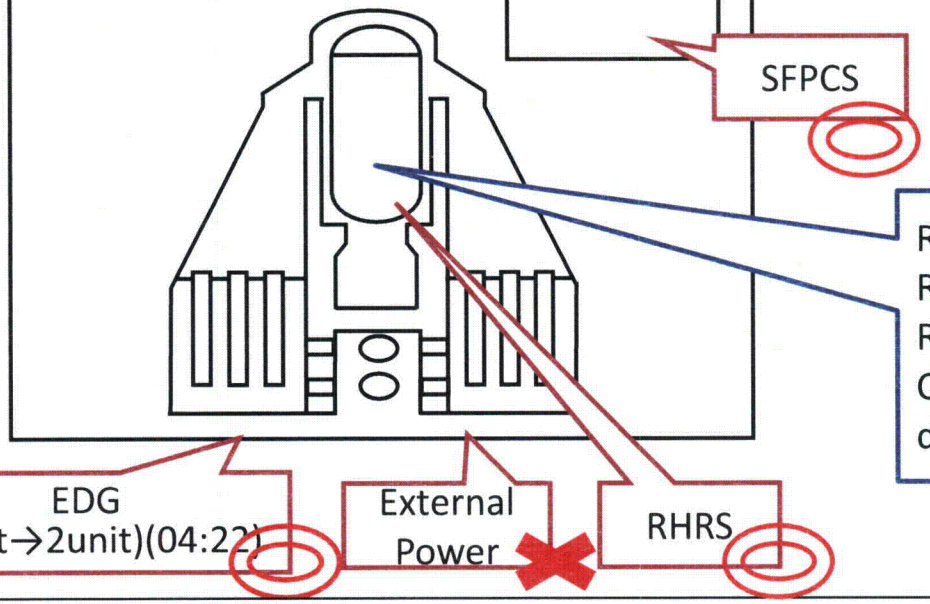
Reactor Pressure: 0.108MPa
Reactor Water Level: 2,037mm
Reactor Water Temperature: 53.2℃ at16:00
Condition: The reactor has been cold shut down. Pressure, etc. is under control.

Time of measurement: 12:00 March 21th
except reactor water temp.

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 6
(As of 15:30 March 21th, 2011)

Water Temperature in the Pool: 35.0℃
Condition: Spent fuel pool cooling function was recovered.

In periodic inspection outage



*Spent Fuel Pool Cooling System

Reactor Pressure: 0.109MPa
Reactor Water Level: 1,613mm
Rector Water Temp: 23.6℃ at16:00
Condition: Reactor has been cold shut down. Pressure, etc. is under control.

Time of measurement: 12:15 March 21th
except reactor water temp.

Current Conditions: Emergency Diesel Generator (1 unit →2 unit) for Unit 6 is being operated. Pump of RHR for Unit 5 and Unit6 started up. Currently Unit 5 is supplied electricity by external power. (Changed from EDG of Unit6 at 11:36 March 21th)
Both reactor have been cold shut down.(Unit 5: 14:30 March 20th, Unit 6: 19:27 March 20th)

Future Operation: Start operating for recovery of external power for Unit 6

Action Taken by NISA

March 11th, 2011

14:46 Set up of the NISA Emergency Preparedness Headquarters (Tokyo) immediately after the earthquake

19:03 Government declared the state of nuclear emergency. (Establishment of Government Nuclear Emergency Response Headquarters and Local Emergency Response Headquarters)

21:23 Directives from Prime Minister to the Governor of Fukushima Prefecture, the Mayor of Okuma Town and the Mayor of Futaba Town were issued regarding the event occurred at Fukushima Dai-ichi NPS, TEPCO, in accordance with the Paragraph 3, the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness as follows:

- Direction for the residents within 3km radius from Unit 1 to evacuate
- Direction for the residents within 10km radius from Unit 1 to stay in-house

Action Taken by NISA

March 12nd, 2011

05:44 Residents within 10km radius from Unit 1 of Fukushima Dai-ichi NPS shall evacuate by the Prime Minister Direction

07:45 Directives from Prime Minister to the Governor of Fukushima Prefecture, the Mayors of Hirono Town, Naraha Town , Tomioka Town and Okuma Town were issued regarding the event occurred at Fukushima Dai-ni NPS, TEPCO, pursuant to the Paragraph 3, the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness as follows:

- Direction for the residents within 3km radius from Fukushima Dai-ni NPS to evacuate
- Direction for the residents within 10km radius from Fukushima Dai-ni NPS to stay in-house 19:03 Government declared the state of nuclear emergency. (Establishment of Government Nuclear Emergency Response Headquarters and Local Emergency Response Headquarters)

17:39 Prime Minister directed evacuation of the residents within the 10 km radius from Fukushima-Dai-ni NPS

18:25 Prime Minister directed evacuation of the residents within the 20km radius from Fukushima Dai-ichi NPS

Action Taken by NISA

March 14th, 2011

01:10 Seawater injection at Unit 1 and Unit 3 of Fukushima Dai-ichi NPS were temporarily interrupted due to the lack of seawater in pit

March 15th, 2011

11:00 Prime Minister directed the in-house stay area.
In-house stay was additionally directed to the residents in the area from 20 km to 30 km radius from Fukushima Dai-ichi NPS considering in-reactor situation.

March 18th, 2011

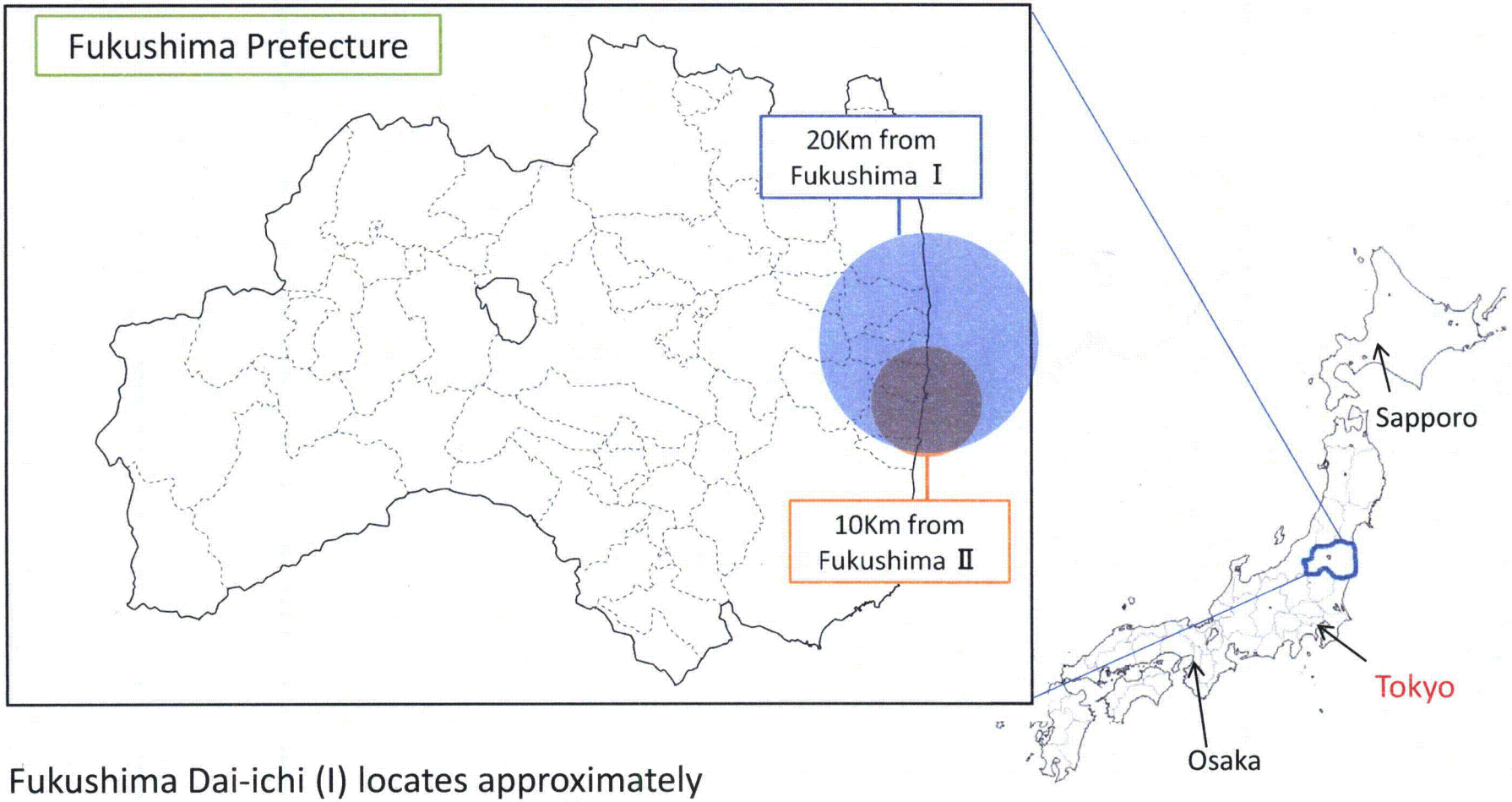
15:55 TEPCO reported to NISA Accidents and Failures with regard to Fukushima Dai-ichi Unit 1,2,3&4 (Leakage of the radioactive materials inside of the reactor building to non-controlled area) pursuant to the Paragraph 3, the Article 62 of the Nuclear Regulation Act.

5-1. Current Situation on Resident Evacuation and Radiation Exposure

- Evacuation as far as 20 kilometers from Fukushima I NPS and 10 kilometers from Fukushima II has been completed. The residents in the areas from 20 kilometers to 30 kilometers radius from Fukushima I NPS are directed to stay in-house.

-On March 16th, the Local Emergency Response Headquarter issued "the direction to administer the stable Iodine during evacuation from the evacuation area (20 km radius)" to the Prefecture Governors and the heads of cities, towns and villages.

5-2. Current Situation



Fukushima Dai-ichi (I) locates approximately
- 230 km from Tokyo
- 580 km from Osaka
- 600 km from Sapporo

Possibility on radiation exposure (As of 15:30 March 21th)

● Exposure of residents

(1) Including the evacuees from Futaba Public Welfare Hospital to Nihonmatsu City Fukushima Gender Equality Centre as the result of measurement of 133 persons at the Centre, 23 persons counted more than 13,000 cpm were decontaminated.

(2) The 35 residents transferred from Futaba Public Welfare Hospital to Kawamata Town Saiseikai Kawamata Hospital by private bus arranged by Fukushima Prefecture were judged to be not contaminated by the Prefectural Response Centre.

(3) As for the about 100 residents in Futaba Town evacuated by bus, the results of measurement for 9 of the 100 residents were as follows. The evacuees were divided into two groups which joined later to Nihonmatsu City Fukushima Gender Equality Centre.

No. of Counts	*No. of Persons*
18,000cpm	1
30,000-36,000cpm	1
40,000cpm	1
little less than 40,000cpm*	1
very small counts	5

*These results were measured without shoes, though the first measurement exceeded 100,000cpm)

Possibility on radiation exposure (As of 15:30 March 21th)

●Exposure of residents

(4) The screening was started at the Off site Center in Okuma Town from March 12th to 15th. 162 people received examination until now. At the beginning, the reference value was set at 6,000cpm. 110 people were at the level below 6,000 cpm and 41 people were at the level of 6,000 cpm or more. When the reference value was increased to 13,000 cpm afterward, 8 people were at the level below 13,000 cpm and 3 people are at the level of 13,000 cpm or more.
The 5 out of 162 people examined were transported to hospital after being decontaminated.

(5) The Fukushima Prefecture carried out the evacuation of patients and personnel of the hospitals located within 10km area. The screening of all the members showed that 3 persons have the high counting rate. These members were transported to the secondary medical institute of exposure. As a result of the screening on 60 fire fighting personnel involved in the transportation activities, the radioactivity higher than twice of the back ground was detected on 3 members even after decontamination and all the 60 members were decontaminated.

●Exposure of workers

•As for the 18 workers conducting operations in Fukushima Dai-ichi NPS, results of measurements are as follows;
One worker: 106.3 mSv. At the level of exposure no internal exposure and medical treatment was not required.
Other workers: No threat of internal exposure and no medical treatment needed.
•The 7 people working at the time of explosion at the Unit 3 of Fukushima Dai-ichi NPS were injured and were conscious. 6 out of 7 people were decontaminated by an industrial doctor of the clinic in Fukushima Dai-ni NPS, and confirmed to have no risk. The other one is having a medical treatment at the clinic after decontaminated.

Reference

Fukushima Dai-ichi NPS, Major Plant Parameters (14:00 March 21th)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Reactor Pressure*1 [MPa]	0.297(A) 0.265(B)	0.081(A) 0.081(B)	0.018(C) 0.144(B)	—	0.108	0.109
CV Pressure (D/W) [kPa]	160	120	120	—	—	—
Reactor Water Level*2 [Mm]	-1,750(A) -1,750(B)	-1,350(A) Not available(B)	-1,600(A) -2,000(B)	—	2,037	1,613
Suppression Pool Water Temperature (S/C) [℃]	—	—	—	—	—	—
Suppression Pool Pressure (S/C) [kPa]	160	down scale	down scale	—	—	—
Spent Fuel Pool Water Temperature [℃]	—	49	—	Not available*3	42.2	35.0
Time of Measurement	08:00 March 21th	08:00 March 21th	12:15 March 21th		12:00 March 21th	12:00 March 21th

*1: Converted from reading value to absolute pressure
*2: Distance from the top of fuel
*3: As of 04:08 March 14th, 84 ℃

Weaver, Tonna

From: Leeds, Eric NRR
Sent: Wednesday, March 23, 2011 2:24 PM
To: Brenner, Eliot; Hayden, Elizabeth
Cc: Borchardt, Bill; Virgilio, Martin; Weber, Michael; Johnson, Michael; Holahan, Gary; Wiggins, Jim; Evans, Michele; Miller, Charles; Sheron, Brian; Uhle, Jennifer; Doane, Margaret; Mamish, Nader; Grobe, Jack; Boger, Bruce; Ruland, William; Dean, Bill; McCree, Victor; Pederson, Cynthia; Howell, Art; Batkin, Joshua
Subject: Heads up: Japan evacuations
Attachments: Japan evacuation.doc

FYI - I asked our contact at the NEA for info on other countries evacuating around Fukushima. Some other members of the international community followed the US recommendation. Some did other things See below and attached.

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

From: Diane.JACKSON@oecd.org [mailto:Diane.JACKSON@oecd.org]
Sent: Wednesday, March 23, 2011 1:22 PM
To: Leeds, Eric
Subject: Your question about Japan evacuations

Eric –

I did some web searching. Canada, South Korea, UK and Australia stated an evacuation distance of 80 km/ 50 miles.

Many countries, such as France, urged their citizens in the north-east Japan and Tokyo to evacuate. In most reports, most countries do not state the reason is nuclear and they do not give a defined distance.

Attached are excerpts from reports with web sources.

Hope that helps,
Diane

PPPP/82

CANADIAN NUCLEAR SAFETY COMMISSION (CNSC): March 17, 2011 19:08 EDT: "Given the evolving situation, Canadians located within 80 km of the Fukushima Nuclear Power Plant should consider, as a further precautionary measure, evacuating this area. The directions of the Japanese government and local emergency response personnel should also be followed by all Canadians in Japan."

CANADA FOREIGN AFFAIRS AND INTERNATIONAL TRADE: 23 March, 2011 "Following damage to the Fukushima nuclear power station in Okumacho, Canadians are strongly advised to follow the advice issued by the Japanese authorities. An evacuation order is in effect for the zone within 20 km of the Fukushima Nuclear Power Plant. Japanese authorities recommend that people between 20 km and 30 km from the plant remain indoors with windows and doors closed and refrain from using ventilation systems. Given the evolving situation, Canadians located within 80 km of the plant are advised that they should, as a further precautionary measure, evacuate this area. The directions of the Japanese government and local emergency response personnel should also be followed by all Canadians in Japan. "

Kyodo News: March 18, Kyodo

http://english.kyodonews.jp/news/2011/03/79157.html

"S. Korea to mobilize military planes to evacuate nationals from Japan"

On Thursday, South Korea upgraded a safety advisory telling its citizens in Japan to stay at least 80 kilometers away from the crippled nuclear reactors in Fukushima Prefecture, more than doubling the previous evacuation distance of 30 km amid rising fears of exposure to radiation.

Australian Business Traveller: 18 March 2011

http://www.ausbt.com.au/australian-government-to-japan-travellers-leave-now-tokyo-unsafe

ARPANSA [the Australian Radiation Protection and Nuclear Safety Agency] recommended that Australians within 80 kilometres of the Fukushima Nuclear Power Plant move out of the area as a precautionary measure.

Travel Weekly: Mar 17, 2011 07:43

"Nuclear fears in Japan prompt FCO warning"

http://www.travelweekly.co.uk/Articles/2011/03/17/36516/nuclear-fears-in-japan-prompt-fco-warning.html

The Government is chartering aircraft to evacuate Britons from Japan to Hong Kong as concerns heighten over fallout from the stricken Fukushima nuclear plant.

The Foreign and Commonwealth Office updated its travel advice today, saying: "Due to the evolving situation at the Fukushima nuclear facility and potential disruptions to the supply of goods, transport, communications, power and other infrastructure, British nationals currently in Tokyo and to the north of Tokyo should consider leaving the area.

"The UK government is chartering flights from Tokyo to Hong Kong to supplement commercially available options for those wishing to leave Japan."

Britons were urged to remain outside an 80km radius of the nuclear plant "as an additional precautionary measure," saying the call was in line with the US government's advice to its citizens in Japan.

"If you are currently between 30km and 80km from the facility, we advise you to leave the area or take shelter indoors if you are unable to travel," the FCO said. Britons seeking to leave Japan were advised to use commercial flights as their first option or register interest in the charter option to Hong Kong.

BBC report: 18 march 2011

http://www.bbc.co.uk/news/world-asia-pacific-12775329

"Foreign evacuations"

- US - providing flights for people who wish to leave, advising 50-mile exclusion zone around Fukushima
- France - urging people to leave northern Japan and Tokyo, sending government planes to fly French out
- UK - advising nationals to leave north-east and Tokyo, chartering flights out
- China - bringing thousands to Niigata for evacuation
- Australia - people with non-essential roles to leave Japan

China says it has evacuated more than 6,000 of its nationals from quake-hit areas, mostly to Niigata on Japan's west coast, and is laying on six to eight additional flights to bring them home.

South Korea has said it will mobilise military ships and aircraft to evacuate its citizens if the situation worsens. At the moment it has told its nationals to stay 50 miles away from the plant.

Most other countries have also advised their nationals to evacuate from the north-eastern region of Japan or to leave the country altogether if they can.

Financial Times report Published: March 17 2011 17:14

"Foreign governments step up evacuations"

http://www.ft.com/cms/s/0/592cdc28-50b1-11e0-9227-00144feab49a.html#axzz1HRMbjqdg

In the clearest sign yet that foreign governments are losing confidence in the Japanese government's ability to contain radioactivity from the crippled reactors, embassies including Australia, China, South Korea and Thailand upgraded their warnings to nationals in Japan.

The US and UK governments on Thursday said they were arranging charter flights for their nationals to leave Japan. The UK and Australia also expanded the evacuation zone to 80km in line with advice from the US to its nationals.

World News Company report: March 17 2011

http://www.worldnewsco.com/4528/residents-radius-80-km-fukushima-nuclear-power-plant/

The government of United States called on their citizens within a radius of 80 kilometers from the **Fukushima nuclear power plant** to leave the area. U.S. warning shows the evacuation radius which is wider than the evacuation order issued by Japanese government.

The Japanese government had previously urged people living within a radius of 20 kilometers from the *Fukushima nuclear power plant* to flee to other places.

The Japanese government also urged people residing within a radius of 32 kilometers from the Fukushima nuclear power plant to not leave the house if they can not leave the area.

While the British Foreign Office said, English people should now consider to go from Tokyo and the northeast region of Japan.

"Concerning the situation in the Fukushima nuclear facilities, the last suggestion of The UK Government Chief Scientific Adviser (GCSA) is for those who are outside the exclusion zone established by the Japanese authorities, no real problems to worry about the **health** of human society. This advice is kept under review constantly," the statement of British Foreign Office.

"However, due to the situation that developed at the Fukushima nuclear facilities and potential disruptions to supply of goods, transportation, communications, electricity and other infrastructure, British citizens who currently resides in Tokyo and the north of Tokyo to consider leaving the area," thus, the official statement of British Foreign Office as reported by the Daily Telegraph on Thursday (March 17, 2011).

The Swiss government also urged its citizens to leave Tokyo and northeastern Japan. Previously, the Australian government had also urged its citizens residing in Tokyo, near Fukushima nuclear power plant and other areas affected by earthquake and tsunami to go to

evacuate. The call of evacuation of residents also issued by the governments of South Korea and France.

International Business Time: March 17, 2011 9:45 PM AEST

http://au.ibtimes.com/articles/123822/20110318/uk-japan.htm

As foreigners in Japan become increasingly desperate to flee the country, the British government has chartered planes to fly Britons in the country from Tokyo to Hong Kong.

"The UK government is chartering flights from Tokyo to Hong Kong to supplement commercially available options for those wishing to leave Japan," said a spokesman for the Foreign Office.

"Due to the evolving situation at the Fukushima nuclear facility and potential disruptions to the supply of goods, transport, communications, power and other infrastructure, British nationals in Tokyo and to the north of Tokyo should consider leaving the area," a UK government spokesman stated.

Britain follows other nations, including France, Turkey and China, which have already advised its nations to leave Japan

Ellmers, Glenn

From: Ellmers, Glenn
Sent: Wednesday, March 23, 2011 11:53 AM
To: Loyd, Susan
Subject: EDO draft update Mar 23 2011.docx
Attachments: EDO draft update Mar 23 2011.docx

Importance: High

PPPP/83

The NRC (as well as many other parts of the US government) is continuing to provide assistance to Japan. Nearly every NRC employee has been affected, in one way or another, by our response to the Japan tragedy. We are beginning to send replacement staff to Japan for our team of NRC experts and 24/7 staffing of the operations center continues. I thank you for your adaptability, flexibility and willingness to contribute your efforts to our important work. Despite the fact that so much public attention is being directed to our Japan efforts, we continue to meet our primary responsibility of ensuring US public health and safety.

Fukushima Event and Normal NRC Operations

Although the situation is still dynamic, events at the Fukushima reactor site appear to be on the road to stabilizing. A wide range of complex technical challenges are being addressed in Japan including the restoration of "normal" AC electric power to the reactor plant equipment. I would like to reiterate my thanks and those of the Chairman and Commission both to those of you who are responding to the events in Japan and to those of you who continue to carry out our mission of ensuring the safe and secure civilian uses of nuclear materials in the United States. I am impressed by the commitment and flexibility you have shown in challenging circumstances. Nearly everyone in the agency has had to step up with extra effort as many managers and staff have been called to extra duties. I would ask you all to continue demonstrating the same dedication for a bit longer, and to continue upholding the NRC Values and the principles of an Open, Collaborative Work Environment.

The Office of Human Resources has distributed information to supervisors and timekeepers to summarize the options and guidelines for determining work schedules and premium pay for employees serving in and supporting the Operations Center, or working in Japan. I ask supervisors to exercise flexibility and understanding as they accommodate responders' often unpredictable work schedule and premium pay needs.

For those who did not have a chance to watch last Friday's All Employees meeting, the video is available here:

http://r2.nrc.gov/videoarchive/ViewVideo.cfm?vlink=275

The video, as well as the Powerpoint files and transcript, of Monday's Commission meeting are available on this NRC public website page dedicated to the Fukushima events. I encourage the staff to periodically check this link for other updated information on the event.

http://www.nrc.gov/japan/japan-info.html

[MAY INSERT INFO ON TASK FORCE COM IF IT COMES DOWN TODAY.]

Continuing Resolution

Congress has passed, and the President signed, another Continuing Resolution, extending federal government funding through April 8th. We continue to be prepared for a variety of scenarios.

Ann Thomas Retirement

Ann Thomas, a long-time NRC employee known to many of you as the editor of the *NRC Reporter* (and before that, the *NR&C* newsletter) and a pillar of the Employees Welfare and Recreation Association, will be retiring at the end of this month. Please join me in extending to Ann our best wishes for a fulfilling retirement in her new home.

Landau, Mindy

From: Landau, Mindy
Sent: Wednesday, March 23, 2011 9:01 AM
To: Ellmers, Glenn
Subject: RE: draft EDO Update

Just edits on the Japan link and the Ann Thomas piece, otherwise looks good to send to the DEDOs, etc.

From: Ellmers, Glenn
Sent: Wednesday, March 23, 2011 8:58 AM
To: Landau, Mindy
Subject: draft EDO Update

The agency faces yet another eventful week, and I want to provide you with a brief EDO Update to keep you informed of the most recent developments.

Fukushima Event and Normal NRC Operations

Although the situation is not yet "normal," events at the Fukushima reactor site appear to be stabilizing. I would like to reiterate my thanks and those of the Chairman and Commission both to those of you who are responding to the events in Japan and to those of you who continue to carry out our mission of ensuring the safe and secure civilian uses of nuclear materials in the United States. I am impressed by the commitment and flexibility you have shown in challenging circumstances. Nearly everyone in the agency has had to step up with extra effort as many managers and staff have been called to extra duties. I would ask you all to continue demonstrating the same dedication for a bit longer, and to continue upholding the NRC Values and the principles of an Open, Collaborative Work Environment.

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PPPD/84

Glenn Ellmers
Senior Communications Specialist, OEDO
301-415-0442
OWFN - 17F03
Mail stop: 016E15

Landau, Mindy

From: Landau, Mindy
Sent: Wednesday, March 23, 2011 12:17 PM
To: Muessle, Mary; Ellmers, Glenn
Cc: Rihm, Roger
Subject: RE: draft EDO Update

Mary, since Bill already commented I think we should go with his version. Your message about the technical details is good – I wonder if he should bring it up at the OD meeting this afternoon – I'll run it by him. I don't think we should make the Markey doc available to the staff because then they will get used to that level of detail and we'll need to keep feeding the beast....

From: Muessle, Mary
Sent: Wednesday, March 23, 2011 12:14 PM
To: Ellmers, Glenn; Landau, Mindy
Cc: Rihm, Roger
Subject: FW: draft EDO Update

Do you think we should mention that we will do our best to keep staff updated with the technical details, but we do not have the resources to have real time updates?

I also saw somewhere that we are preparing something on status for Markey daily. Is this something we could post for the staff?

Mary Muessle
Assistant for Operations - Acting
Office of the Executive Director for Operations
U.S. Nuclear Regulatory Commission
301-415-1703 office
301-415-2700 fax

From: Ellmers, Glenn
Sent: Wednesday, March 23, 2011 9:38 AM
To: Muessle, Mary; Virgilio, Martin; Weber, Michael; Ash, Darren
Subject: draft EDO Update

The agency faces yet another eventful week, and I want to provide you with a brief EDO Update to keep you informed of the most recent developments.

Fukushima Event and Normal NRC Operations

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PPPP/85

- The Office of Human Resources has distributed information to supervisors and timekeepers to summarize the options and guidelines for determining work schedules and premium pay for employees serving in and supporting the Operations Center, or working in Japan. I ask supervisors to exercise flexibility and understanding as they accommodate responders' often unpredictable work schedule and premium pay needs.

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Congress has passed, and the President signed, another Continuing Resolution, extending federal government funding through April 8th. We continue to be prepared for a variety of outcomes, in case a budget is not passed.

Ann Thomas Retirement

Ann Thomas, a long-time NRC employee known to many of you as the editor of the *NRC Reporter* (and before that, the *NR&C* newsletter) and a pillar of the Employees Welfare and Recreation Association, will be retiring at the end of this month. Please join me in extending to Ann our best wishes for a fulfilling retirement in her new home.

Glenn Ellmers
Senior Communications Specialist, OEDO
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OWFN - 17F03
Mail stop: 016E15

From: RMTPACTSU_ELNRC <RMTPACTSU_ELNRC@ofda.gov>
Sent: Thursday, March 24, 2011 9:30 AM
To: LIA01 Hoc; LIA02 Hoc; LIA07 Hoc; ET07 Hoc
Subject: FYI: IAEA distributed documents
Attachments: Plant_Parameter_1800_23March.pdf; Photos_Fukushima_Daiichi_J.pdf; NISA_MEXT_News_Release_No46_(japanese).pdf; Plant_parameter(japanese).pdf; Plant_Environmetal_Monitoring_data(Japanese)_2011_03_23.pdf; Plant_status_(japanese).pdf; NISA_METI_Press_Release___45_(Japanese).pdf; Letter_-_Summary_of_reactor_unit_status_at_1600_23-March_UTC.pdf

Subject: RE: IAEA distributed documents

PPPP 186

福島第一原子力発電所　プラント関連パラメータ

3月23日　18:00現在

号機	1u	2u	3u	4u	5u	6u
注水状況	給水ライン等を用いた海水注入中。 ①流量 1 m^3/hr(消火系ライン) (本設計器) (3/23 14:20) ②流量 18Bl/min(給水ライン) (3/23 11:00)	消火系ラインを用いた海水注入中。 流量 12 m^3/hr (本設計器)(3/23 14:00)	消火系ラインを用いた海水注入中。 流量 ハンチング (本設計器)(3/23 09:10)	停止中	停止中	停止中
原子炉水位	燃料域A：−1750mm 燃料域B：−1700mm (3/23 16:00 現在)	燃料域A：−1250mm (3/23 14:00 現在)	燃料域A：−1800mm 燃料域B：−2300mm (3/23 09:10 現在)	−	停止域 1723mm (3/23 18:00 現在)	停止域 2758mm (3/23 18:00 現在)
原子炉圧力	0.380MPa g (A) 0.358MPa g (B) (3/23 16:00 現在)	−0.036MPa g (A) −0.036MPa g (B) (3/23 14:00 現在)	−0.104MPa g (C) 0.034MPa g (A) (3/23 09:10 現在)	−	0.007MPa g (3/23 18:00 現在)	0.008MPa g (3/23 18:00 現在)
原子炉水温度	−			−	40.9℃ (3/23 18:00 現在)	75.7℃ (3/23 18:00 現在)
原子炉圧力容器温度	給水ノズル温度：305℃ 圧力容器下部温度：306℃ (3/23 16:00 現在)	給水ノズル温度：101℃ 圧力容器下部温度：102℃ (3/23 14:00 現在)	給水ノズル温度：304.8℃ 圧力容器下部温度：225.5℃ (3/23 9:10 現在※)	4u:原子炉内に発熱体（燃料）なし 5,6u:原子炉水温度にて監視中		
D/W・S/C 圧力	D/W 0.360MPa abs S/C 0.330MPa abs (3/23 16:00 現在)	D/W 0.11MPa abs S/C ダウンスケール (3/23 14:00 現在)	D/W 0.100MPa abs S/C ダウンスケール (3/23 09:10 現在)	−		
CAMS	D/W 4.80X10^1Sv/h S/C 2.99X10^1Sv/h (3/23 14:20 現在)	D/W 5.07X10^1Sv/h S/C 1.67X10^0Sv/h (3/23 14:00 現在)	D/W 6.02X10^1Sv/h S/C 1.74X10^0Sv/h (3/23 09:10 現在)	−		
D/W 設計使用圧力	0.384MPa g	0.384MPa g	0.384MPa g	−		
D/W 最高使用圧力	0.427MPa g	0.427MPa g	0.427MPa g			
使用済燃料プール水温度	−	51℃ (3/23 04:20 現在)	−	84℃ (3/14 4:08)	41.1℃ (3/23 18:00 現在)	19.0℃ (3/23 18:00 現在)
電源	外部電源受電中 (P/C2C)		外部電源受電中 (P/C4D)		外部電源受電中	
その他情報						

地震被害情報（第４６報）
（３月２３日１９時００分現在）

原子力安全・保安院が現時点で把握している東京電力(株)福島第一原子力発電所、福島第二原子力発電所、東北電力㈱女川原子力発電所、日本原子力発電（株）東海第二、電気、ガス、熱供給、コンビナート被害の状況は、以下のとおりです。

前回からの変更点は以下のとおり。

１．原子力発電所関係

○福島第一原子力発電所

【注水・放水関係】

・４号機について、コンクリートポンプ車（50ｔ／ｈ）が約 130ｔ放水（23日 10:00～13:02）
・３号機について、使用済燃料プールに冷却浄化系から海水 35t 注入（23日 11:03～13:20）
・３号機原子炉建屋からやや黒色がかった煙が発生（23 日 16:20 頃）

２．産業保安関係

別紙参照

＜消防機関の活動状況＞

・３月２３日、8:30～9:30、13:30～14:30：新潟市消防局及び浜松市消防局が大型除染システムの東京電力による運用を指導。

（別紙）

１　発電所の運転状況【自動停止号機数：１０基】

○東京電力(株)福島第一原子力発電所（福島県双葉郡大熊町及び双葉町）

（１）運転状況

１号機（46 万 kW）（自動停止）

２号機（78 万 4 千 kW）（自動停止）

３号機（78 万 4 千 kW）（自動停止）

４号機（78 万 4 千 kW）（定検により停止中）

５号機（78 万 4 千 kW）（定検により停止中、20 日 14:30 冷温停止）

６号機（110 万 kW）（定検により停止中、20 日 19:27 冷温停止）

（２）モニタリングの状況

別添参照

（３）主なプラントパラメーター（23 日 18:00 現在）

	１号機	２号機	３号機	４号機	５号機	６号機
原子炉圧力*1 [MPa]	0.481(A) 0.459(B)	0.065(A) 0.065(B)	-0.003(C) 0.135(A)	－	0.108	0.109
原子炉格納容器圧力（D/W）[kPa]	360	110	100	－	－	－
原子炉水位*2 [mm]	-1750(A) -1700(B)	-1250(A) 不明（B）	-1800(A) -2300(B)	－	1723	2758
原子炉格納容器内 S/C 水温 [℃]	－	－	－	－	－	－
原子炉格納容器内 S/C 圧力 [kPa]	330	D/S	D/S	－	－	－
使用済燃料プール水温度 [℃]	－	51*4	－	不明*3	41.1	19.0
備　考	3/23 16:00 現在の値	3/23 14:00 現在の値	3/23 09:10 現在の値		3/23 18:00 現在の値	3/23 18:00 現在の値

＊１：絶対圧に換算

＊２：燃料頂部からの数値

＊３：3 月 14 日 4:08 現在、84℃

＊４：3 月 23 日 4:20 現在

（４）各プラントの状況

＜１号機関係＞

・原子力災害対策特別措置法第１５条（非常用炉心冷却装置注水不能）通報（11 日 16:36）
・１号機の原子炉圧力容器内に消火系ラインを用いて海水注入開始(12 日 20:20)→14 日 01:10 一時中断
・１号機で爆発音。(12 日 15:36)
・消火系に加え、給水系を使うことにより炉心への注水量を増量（2m^3／h→18m^3／h）(23 日 02:33)。その後、微調整（約 11 m^3／h）(23 日 11:00 頃)
・原子炉圧力容器へ海水注入中。(23 日 19:00 現在)

＜２号機関係＞

・原子力災害対策特別措置法第１５条（非常用炉心冷却装置注水不能）通報（11 日 16:36）
・３号機の建屋の爆発に伴い、原子炉建屋ブローアウトパネル開放（14 日 11 時過ぎ）
・原子炉圧力容器の水位が低下傾向（14 日 13:18)。原子力災害対策特別措置法第１５条事象（原子炉冷却機能喪失）である旨、受信（14 日 13:49）
・原子炉圧力容器内に消火系ラインを用いて海水注入準備(14 日 19:20)
・原子炉圧力容器の水位が低下傾向（14 日 22:50)
・２号機で爆発音するとともに、サプレッションプール（圧力抑制室）の圧力低下（15 日 6:10)。同室に異常が発生したおそれ（15 日 6:20 頃)
・外部送電線から予備電源変電設備までの受電を完了し、そこから負荷側へのケーブル敷設を実施（19 日 13:30 現在）
・使用済燃料プールに海水を 40ｔ注入（冷却系配管に消防車のポンプを接続）(20 日 15:05～17:20)
・２号機のパワーセンター受電（20 日 15:46)
・白煙が発生（21 日 18:22)
・白煙はほとんど見えない程度に減少（22 日 7:11 現在）
・使用済燃料プールに海水を 18ｔ注入（22 日 16:07～17:01)
・原子炉圧力容器へ海水注入中（23 日 19:00 現在）

＜３号機関係＞

・３号機の原子炉圧力容器内に消火系ラインから真水注入開始(13 日 11:55)
・３号機の原子炉圧力容器内に消火系ラインから海水注入開始(13 日 13:12)
・３号機及び１号機の注入をくみ上げ箇所の海水が少なくなったため停止

(14 日 1:10)
・３号機の海水注入を再開(14 日 3:20)
・３号機の格納容器圧力が異常上昇(14 日 7:44)。原子力災害対策特別措置法第１５条事象である旨、受信（14 日 7:52）
・３号機で１号機と同様に原子炉建屋付近で爆発（14 日 11:01）
・３号機から白い湯気のような煙が発生（16 日 8:30 頃）
・３号機の格納容器が破損しているおそれがあるため、中央制御室（共用）から作業員退避（16 日 10:45)。その後、作業員は中央制御室に復帰し、注水作業再開（16 日 11:30）
・自衛隊ヘリにより３号機への海水の投下を４回実施（17 日 9:48、9:52、9:58、10:01）
・警察庁機動隊が放水のため現場到着（17 日 16:10）
・自衛隊消防車により放水（17 日 19:35)。
・警察庁機動隊による放水（17 日 19:05～19:13）
・自衛隊消防車５台が放水（17 日 19:35、19:45、19:53、20:00、20:07）
・自衛隊消防車６台（６ｔ放水／台）が放水（18 日 14 時前～14:38）
・米軍消防車１台が放水（18 日 14:45 終了）
・東京消防庁ハイパーレスキュー１４台が正門前に到着し（18 日 23:10)、うち、６台が地上放水のため発電所に入構（18 日 23:30）
・東京消防庁ハイパーレスキュー隊が放水（20 日 3:40 終了）
・３号機の格納容器内圧力が上昇（20 日 11:00 現在 320kPa)。圧力下げるための準備を進めていたが、直ちに放出を必要とする状況ではないと判断し、圧力監視を継続（21 日 12:15 120 kPa）
・ケーブル引き込みの現地調査（20 日 11:00～16:00）
・東京消防庁ハイパーレスキュー隊が３号機の使用済燃料プールに放水（20 日 21:39～21 日 03:58）
・灰色がかった煙が発生（21 日 15:55 頃）
・煙が収まっていることを確認（21 日 17:55）
・灰色がかった煙は白みがかった煙に変化し終息に向かっていると思われる（22 日 7:11 現在）
・東京消防庁及び大阪市消防局が放水（約 180t）（22 日 15:10～15:59）
・中央操作室の照明が復帰（22 日 22:43）
・使用済燃料プールに冷却浄化系から海水 35t 注入（23 日 11:03～13:20）
・原子炉建屋からやや黒色がかった煙が発生（23 日 16:20 頃）
・原子炉圧力容器へ海水注入中（23 日 19:00 現在）

＜４号機関係＞

・原子炉圧力容器のシュラウド工事中のため、原子炉圧力容器内に燃料はなし。
・４号機の使用済燃料プール水温度が上昇（3 月 14 日 4:08 時点 84℃）
・４号機のオペレーションエリアの壁が一部破損していることを確認（15 日 6:14）。
・４号機で火災発生。（15 日 9:38）事業者によると、自然に火が消えていることを確認（15 日 11:00 頃）
・４号機で火災が発生（16 日 5:45 頃）。事業者は現場での火災は確認できず（16 日 6:15 頃）。
・自衛隊が４号機の使用済燃料プールへ放水（20 日 9:43）
・ケーブル引き込みの現地調査（20 日 11:00～16:00）
・自衛隊が４号機の使用済燃料プールへ放水（20 日 18:30 頃～19:46）
・自衛隊消防車１３台が使用済燃料プールに放水（21 日 06:37～08:41）
・パワーセンターまでのケーブル敷設工事完了（21 日 15:00 頃）
・パワーセンター受電（22 日 10:35）
・コンクリートポンプ車（50ｔ／ｈ）が約 150ｔ放水（22 日 17:17～20:32）
・コンクリートポンプ車（50ｔ／ｈ）が約 130ｔ放水（23 日 10:00～13:02）

＜５号機，６号機関係＞

・６号機の非常用ディーゼル発電機（D/G）１台目（B）は運転により電力供給。復水補給水系（MUWC）を用いて原子炉圧力容器及び使用済燃料プールへ注水。
・６号機の非常用ディーゼル発電機（D/G）２台目（Ａ）起動。（19 日 4:22）
・５号機の残留熱除去系（ＲＨＲ）ポンプ（Ｃ）（19 日 5:00）及び６号機の残留熱除去系（ＲＨＲ）ポンプ（Ｂ）（19 日 22:14）が起動し、除熱機能回復。使用済燃料プールを優先的に冷却（電源：６号の非常用ディーゼル発電機）（19 日 5:00）
・５号機、冷温停止（20 日 14:30）
・６号機、冷温停止（20 日 19:27）
・５号機及び６号機、起動用変圧器まで受電（20 日 19:52）
・５号機、電源を非常用ディーゼル発電機から外部電源に切り替え（21 日 11:36）
・６号機、電源を非常用ディーゼル発電機から外部電源に切り替え（22 日 19:17）

＜使用済燃料共用プール＞

・１８日６：００過ぎ、プールはほぼ満水であることを確認

・１９日９：００時点でのプール水温度は５７℃程度
・共用プールに注水（21 日 10:37～15:30）
・２１日１６：３０時点でのプール水温度は６１℃程度

○東京電力(株)福島第二原子力発電所（福島県双葉郡楢葉町及び富岡町）

（１）運転状況

１号機（110 万 kW）（自動停止、14 日 17:00 冷温停止）
２号機（110 万 kW）（自動停止）14 日 18:00 冷温停止）
３号機（110 万 kW）（自動停止、12 日 12:15 冷温停止）
４号機（110 万 kW）（自動停止、15 日 7:15 冷温停止）

（２）モニタリングポスト等の指示値

別添参照

（３）主なプラントパラメーター（23 日 18:00 現在）

	単位	１号機	２号機	３号機	４号機
原子炉圧力*1	MPa	0.15	0.13	0.11	0.15
原子炉水温	℃	30.8	28.0	34.0	30.1
原子炉水位*2	mm	9146	10296	8409	8785
原子炉格納容器内 ｻﾌﾟﾚｯｼｮﾝﾌﾟｰﾙ水温	℃	25	24	26	25
原子炉格納容器内 ｻﾌﾟﾚｯｼｮﾝﾌﾟｰﾙ圧力	kPa (abs)	108	106	104	104
備　考		冷温停止中	冷温停止中	冷温停止中	冷温停止中

＊１：絶対圧に換算
＊２：燃料頂部からの数値

（４）その他異常等に関する報告

・１号機にて原子力災害対策特別措置法第１０条通報（11 日 18:08）
・１、２、４号機にて同法第１０条通報（11 日 18:33）
・１号機にて原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生（12 日 5:22）
・２号機にて原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生（12 日 5:32）
・４号機にて原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生（12 日 6:07）

○東北電力(株)女川原子力発電所（宮城県牡鹿郡女川町、石巻市）

（１）運転状況

１号機（52万4千kW）（自動停止、12日0:58冷温停止）

２号機（82万5千kW）（自動停止、地震時点で冷温停止）

３号機（82万5千kW）（自動停止、12日1:17冷温停止）

（２）モニタリングポスト等の指示値

MP２付近（敷地最北敷地境界）：

約1.4μSv/h（22日16:00）→約1.2μSv/h（23日16:00）

（３）その他異常に関する報告

・タービン建屋地下１階の発煙は消火確認（11日22:55）

・原子力災害対策特別措置法第１０条通報（13日13:09）

２　産業保安

○電気（3月23日19:00現在）

・東北電力（3月23日18:00現在）

停電戸数：約２１万戸　（延べ停電戸数　約４８６万戸）

停電地域：青森県　三八の一部地域（約５百戸）

岩手県　一部地域（約３万８千戸）

宮城県　一部地域（約１３万３千戸）

福島県　一部地域（約３万８千戸）

・東京電力

停電は3月19日01:00までに復旧済（延べ停電戸数　約４０５万戸）

・北海道電力

停電は3月12日14:00までに復旧済　（延べ停電戸数　約３千戸）

・中部電力

停電は3月12日17:11に復旧済　（延べ停電戸数　約４百戸）

○一般ガス（3月23日19:00現在）

死亡事故：地震との関係も含め原因詳細調査中。

・盛岡ガス（盛岡市）死者1名、負傷者10名

14日08:00　デパートの地下での爆発

・東部ガス（いわき市）死者１名

12日11:30　一般住宅での漏えいガスに着火

北海道、山形県、秋田県においては、供給停止の報告はない。

各社の供給停止状況は以下の通り。

・仙台市営ガス　358,781戸供給停止

・塩釜ガス(塩釜市)12,382 戸供給停止
・福島ガス（福島市）60 戸供給停止
・東部ガス（土浦市）2,796 戸供給停止
（水戸市）40 戸供給停止
・釜石ガス（釜石市）7,000 戸供給停止
・常磐共同ガス（いわき市）12,018 戸供給停止
・京葉ガス（浦安市）4,634 戸供給停止
・東北ガス（白河市）125 戸供給停止
・常磐都市ガス（いわき市）362 戸供給停止
・気仙沼市営ガス（気仙沼市）2,800 戸供給停止
・石巻ガス（石巻市）14,771 戸供給停止

○簡易ガス（3 月 23 日 19:00 現在）
各社の供給停止状況は以下の通り。
・宮城ガス（塩竈市）651 戸供給停止
（仙台市）2,058 戸供給停止
（黒川郡富谷町）2,318 戸供給停止
・岩沼市農業協同組合（岩沼市）753 戸供給停止
・橋本産業（東松島市）80 戸供給停止
・富岡ガス協業組合（双葉郡富岡町）428 戸供給停止
・福陽ガス（須賀川市）81 戸供給停止
・釜石瓦斯（釜石市）1,357 戸供給停止
・仙台市ガス局（名取市）1,225 戸供給停止
（仙台市）559 戸供給停止
（岩沼市）342 戸供給停止
（黒川郡富谷町）1,855 戸供給停止
・仙台プロパン（登米市）93 戸供給停止
（亘理郡山元町）360 戸供給停止
（東松島市）150 戸供給停止
・仙南ガス（白石市）409 戸供給停止
（岩沼市）252 戸供給停止
（柴田郡柴田町）1,806 戸供給停止
・カメイ（亘理郡山元町）189 戸供給停止
（白河市）596 戸供給停止
（須賀川市）783 戸供給停止
（いわき市）126 戸供給停止
（宮古市）197 戸供給停止

（東松島市矢本町）243 戸供給停止
・岩手中部ガス（北上市）779 戸供給停止
・共同ガス（須賀川市）163 戸供給停止
・東北ガス（白河市）360 戸供給停止
・いわきガス（いわき市）594 戸供給停止
・相馬ガス（相馬市）143 戸供給停止
・相馬市ガス（相馬市）100 戸供給停止
・勝田ガス事業協同組合（ひたちなか市）647 戸供給停止
・倉島商事（福島市）248 戸供給停止
・若松ガス（福島市）1,061 戸供給停止
・アイソン（安達郡本宮町）489 戸供給停止
・トーホクガス（多賀城市）130 戸供給停止
・三重商会（大船渡市）81 戸供給停止
・名取岩沼農業協同組合（岩沼市）586 戸供給停止
・ガス＆ライフ（東松島市）859 戸供給停止
・仙台エルピーガス（仙台市）3,594 戸供給停止

○熱供給（3 月 23 日 19:00 現在）
・小名浜配湯（いわき市小名浜）供給停止

○ＬＰガス（3 月 23 日 19:00 現在）
死亡事故：地震との関係も含め原因詳細調査中
・福島県いわき市　死者１名
　１３日午前中　共同住宅でガス爆発

○コンビナート（3 月 23 日 19:00 現在）
・コスモ石油千葉製油所（千葉県市原市）
ＬＰＧ貯槽の支柱が折れ、破損。ガス漏れ火災。
重傷者１名、軽傷５名。3 月 21 日午前鎮火。
・JX 日鉱日石エネルギー(株)仙台製油所（宮城県仙台市）
出荷設備エリアで爆発、火災が発生。3 月 15 日午後鎮火。

3　原子力安全・保安院等の対応

【3 月 11 日】
１４：４６　地震発生と同時に原子力安全・保安院に災害対策本部設置
１５：４２　福島第一原子力発電所にて原子力災害対策特別措置法第１０条通報

１６：３６　福島第一原子力発電所１、２号機にて事業者が同法第１５条事象（非常用炉心冷却装置注水不能）発生判断（16:45 通報）

１８：０８　福島第二原子力発電所１号機にて原子力災害対策特別措置法第１０条通報

１８：３３　福島第二原子力発電所１、２、４号機にて原子力災害対策特別措置法第１０条通報

１９：０３　緊急事態宣言（政府原子力災害対策本部及び同現地対策本部設置）

２０：５０　福島県対策本部は、福島第一原子力発電所１号機の半径２ｋｍの住人に避難指示を出した。（２ｋｍ以内の住人は 1,864 人）

２１：２３　内閣総理大臣より、福島県知事、大熊町長及び双葉町長に対し、東京電力(株)福島第一原子力発電所で発生した事故に関し、原子力災害対策特別措置法第１５条第３項の規定に基づく指示を出した。

・福島第一原子力発電所から半径３ｋｍ圏内の住民に対する避難指示。

・福島第一原子力発電所から半径１０ｋｍ圏内の住民に対する屋内退避指示。

２４：００　池田経済産業副大臣現地対策本部到着

【3 月 12 日】

５：２２　福島第二原子力発電所１号機にて事業者が原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生判断（6:27 通報）

５：３２　福島第二原子力発電所２号機にて事業者が原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生判断（6:27 通報）

５：４４　総理指示により福島第一原子力発電所の１０ｋｍ圏内に避難指示

６：０７　福島第二原子力発電所４号機にて原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生

６：５０　原子炉等規制法第６４条第３項の規定に基づき、福島第一原子力発電所第１号機及び第２号機に設置された原子炉格納容器内の圧力を抑制することを命じた。

７：４５　内閣総理大臣より、福島県知事、広野町長、楢葉町長、富岡町長及び大熊町長に対し、東京電力(株)福島第二原子力発電所で発生した事故に関し、原子力災害対策特別措置法第１５条第３項の規定に基づく指示を出した。

・福島第二原子力発電所から半径３ｋｍ圏内の住民に対する避難指示。

・福島第二原子力発電所から半径１０ｋｍ圏内の住民に対する屋内退避指示。

１７：００　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事

象（敷地境界放射線量異常上昇）である旨、受信

１７：３９　内閣総理大臣が福島第二原子力発電所の避難区域
・福島第二原子力発電所から半径１０ｋｍ圏内の住民に対する避難を指示。

１８：２５　内閣総理大臣が福島第一原子力発電所の避難区域
・福島第一原子力発電所から半径２０ｋｍ圏内の住民に対する避難を指示。

１９：５５　福島第一原子力発電所１号機の海水注入について総理指示

２０：０５　総理指示を踏まえ、原子炉等規制法第６４条第３項の規定に基づき、福島第一原子力発電所第１号機の海水注入等を命じた。

２０：２０　福島第一原子力発電所１号機の海水注入を開始

【3月13日】

５：３８　福島第一原子力発電所３号機にて原子力災害対策特別措置法第１５条事象（全注水機能喪失）である旨、受信。
当該サイトについて、東京電力において現在、電源及び注水機能の回復と、ベントのための作業を実施中。

９：０１　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

９：０８　福島第一原子力発電所３号機の圧力抑制及び真水注入を開始

９：２０　福島第一原子力発電所３号機の耐圧ベント弁開放

９：３０　福島県知事、大熊町長、双葉町長、富岡町長、浪江町長に対し、原子力災害対策特別措置法に基づき、放射能除染スクリーニングの内容について指示

９：３８　福島第一原子力発電所１号機にて原子力災害対策特別措置法第１５条通報

１３：０９　女川原子力発電所にて原子力災害対策特別措置法第１０条通報

１３：１２　福島第一原子力発電所３号機の注入を真水から海水に切り替え

１４：３６　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

【3月14日】

１：１０　福島第一原子力発電所１号機及び３号機の注入をくみ上げ箇所の海水が少なくなったため停止。

３：２０　福島第一原子力発電所３号機の海水注入を再開

４：４０　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

５：３８　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

７：５２　福島第一原子力発電所３号機にて原子力災害対策特別措置法第１５条事象（格納容器圧力異常上昇）である旨、受信。

１３：２５　福島第一原子力発電所２号機にて原子力災害対策特別措置法第１５条事象（原子炉冷却機能喪失）である旨、受信。

２２：１３　福島第二原子力発電所にて原子力災害対策特別措置法第１０条通報

２２：３５　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

【3月15日】

０：００　国際原子力（ＩＡＥＡ）専門家派遣の受け入れを決定

ＩＡＥＡ天野事務局長による原子力発電所の被害に関する専門家派遣の意向を受け、原子力安全・保安院はＩＡＥＡによる知見ある専門家の派遣を受け入れることとした。なお、実際の受け入れ日程等については、今後調整を行う。

０：００　米国原子力規制委員会（ＮＲＣ）専門家派遣の受け入れを決定

７：２１　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

７：２４　（独）日本原子力研究開発機構東海研究開発センター核燃料サイクル工学研究所にて原子力災害対策特別措置法第１０条通報

７：４４　（独）日本原子力研究開発機構原子力科学研究所にて原子力災害対策特別措置法第１０条通報

８：５４　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

１０：３０　経済産業大臣が原子炉等規制法に基づき、４号機の消火及び再臨界の防止、２号機の原子炉内への早期注水及びドライウェルのベントの実施について指示

１０：５９　今後の事態の長期化を考慮し、現地対策本部の機能を福島県庁内へ移転することを決定。

１１：００　内閣総理大臣が福島第一原子力発電所の避難区域

・炉内の状況を考慮して、新たに福島第一原子力発電所から半径２０ｋｍ圏～３０ｋｍ圏内の住民に対する屋内退避を指示

１６：３０　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

２２：００　経済産業大臣が原子炉等規制法に基づき、４号機の使用済燃料プールへの注水の実施を指示

２３：４６　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

【3月18日】

１３：００　文部科学省にて、福島第一、第二原子力発電所の緊急時における全国的モニタリング調査の強化を決定

１５：５５　原子炉等規制法第６２条の３に基づき、東京電力(株)福島第一原子力発電所第１・２・３・４号機における事故故障等（原子炉建屋内の放射性物質の非管理区域への漏えい）の報告を受理

１６：４８　原子炉等規制法第６２条の３に基づき、日本原子力発電(株)東海第二発電所における事故故障等(非常用ディーゼル発電機２Ｃ海水ポンプ用電動機の故障）の報告を受理

【3月19日】

７：４４　６号機の非常用ディーゼル発電機２台目（Ａ）起動

５号機の残留熱除去系（ＲＨＲ）ポンプ（Ｃ）が起動し、使用済燃料プールの冷却を開始(電源：６号機の非常用ディーゼル発電機))の旨を受信

８：５８　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

【3月20日】

２３：３０　原子力災害対策現地本部から、放射能除染スクリーニングレベルの基準を以下のとおり変更する旨、県知事及び関係市町村長（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯舘村）宛に指示

【3月21日】

７：４５　原子力災害対策現地本部から「安定ヨウ素剤の服用について」として、安定ヨウ素剤の服用は、本部の指示を受け、医療関係者の立ち会いのもとで服用するものであり、個人の判断で服用しない旨の指示を、県知事及び関係市町村長（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯舘村）宛に発出

１６：４５　原子力災害対策現地本部長から「屋内退避圏内での暖房器具の使用に係る換気について」として、一酸化炭素中毒等の防止の観点及び被ばく低減の観点から、屋内において換気を必要とする暖房器具を使用する場合の対応について屋内退避圏内の住民に周知する旨の指示を福島県知事及び市町村長(いわき市、田村市、南相馬市、広野町、川内村、浪江町、葛尾村、飯舘村）宛に発出。

１７：５０　原子力災害対策本部長から、ホウレンソウ及びカキナ、原乳について当分の間、出荷を控えるよう、関係事業者等に要請することの指示を福島県、茨城県、栃木県及び群馬県の各知事宛に発出。

【3月22日】

１６：００　原子力安全委員会緊急技術助言組織から、3月22日付け東京電力の「海水分析結果について」に関する原子力安全・保安院からの助言依頼について、回答（助言）を受理。

＜被ばくの可能性（3月23日19:00現在）＞

１．住民の被ばく

（１）二本松市福島県男女共生センターにおいて、双葉厚生病院からの避難者約60名を含む133名の測定を行い、13,000cpm以上の23名に除染を実施した。

（２）この他、福島県が用意した民間バスで、双葉厚生病院から川俣町済生会川俣病院へ移動した35名については、県対策本部は被ばくしていないと判断。

（３）バスにより避難した双葉町の住民約100名について、100名のうち、9名について測定した結果、以下の通りだった。県外(宮城県)に分かれて避難したが、その後合流して二本松市福島男女共生センターへ移動。

カウント数	人数
18,000cpm	１名
30,000～36,000cpm	１名
40,000cpm	１名
40,000cpm弱※	１名
ごく小さい値	５名

※（１回目の測定では100,000cpmを超え、その後靴を脱いで測定した結果計測されたもの）

（４）３月１２日から３月１５日にかけて、大熊町のオフサイトセンターにおいて、スクリーニングを開始。現在までに162名が検査済み。初め除染の基準値を6,000cpmとし、110名が6,000cpm未満、41名が6,000cpm異常の値を示した。後に基準値を13,000cpmと引き上げた際には、８名が13,000cpm未満、３名が13,000cpm以上の値を示した。

検査を受けた162名のうち、５名が除染処置を施した後、病院へ搬送された。

（５）福島県において、避難した１０ｋｍ圏内の入院患者と病院関係者の避難を実施。関係者のスクリーニングを行った結果、3名について除染後も高い数値が検出されたため、第２次被ばく医療機関へ搬送。この搬送に関係した消防職員60名のスクリーニングで3名について、バックグランドの２倍以上程度の放射線が検出されたため、60名に対し除染を行った。

２．従業員等の被ばく

（１）福島第一原発で作業していた従業員１８名。測定の結果、１名は106.3mSv、その他の方は健康に影響ないレベルであるが具体的な数値は不明。106.3mSv の１名は、内部被ばくの恐れはなく医療的処置は不要とのこと。

（２）福島第一原発３号機の爆発の際に近くで作業していて負傷した従業員７名（意識あり）負傷。そのうち６名については福島第二の産業医で除染処置を施し、問題ないことを確認。１名については病院で除染し、治療を終了。

３．その他

（１）福島県は３月１３日からスクリーニングを開始。避難所を巡回、保健所等１２ヶ所（常設）で実施中。実施結果は集計中。

（２）福島第一原発で給水作業に従事していた自衛隊員５名が被ばく。作業終了後（１２日）、ＯＦＣへ移動後の測定では 30,000cpm。除染後の測定では、5,000～10,000cpm。１名は放医研に搬送。防衛省において、その他自衛官の被ばくは確認されず。

（３）警察官について、警察庁において２名の除染の実施を確認。異常の報告はなし。

＜放射能除染スクリーニングレベルに関する指示＞

（１）３月２０日、原子力災害対策現地本部から、放射能除染スクリーニングレベルの基準を以下のとおり変更する旨、県知事及び関係市町村長（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯舘村）宛に指示。

旧：γ線サーベイメーターにより 40 ベクレル/c ㎡または 6,000cpm

新：１マイクロシーベルト／時（10cm 離れた場所での線量率）またはこれに相当する 100,000cpm

＜避難時における安定ヨウ素剤投与の指示＞

（１）３月１６日、原子力災害対策現地本部から、「避難区域（半径２０ｋｍ）からの避難時における安定ヨウ素剤投与の指示」を県知事及び市町村（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯舘村）宛に発出。

（２）３月２１日、原子力災害対策現地本部から「安定ヨウ素剤の服用について」として、安定ヨウ素剤の服用は、本部の指示を受け、医療関係者

の立ち会いのもとで服用するものであり、個人の判断で服用しない旨の指示を、県知事及び関係市町村長（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯舘村）宛に発出。

＜負傷者の状況（3月23日19:00現在）＞

1．地震による被害

・社員2名（軽傷）
・協力会社2名（うち1名両足骨折）
・行方不明2名（社員。4号タービン建屋内）
・急病人1名発生（脳梗塞、救急車搬送、県情報）
・管理区域外にて社員1名が左胸の痛みを訴えて救急車を要請（意識あり）
・社員2名が中央制御室での全面マスク着用中に不調を訴え、福島第二の産業医の受診を受けるべく搬送2．福島第一原子力発電所1号機爆発による被害

2．福島第一原子力発電所1号機の爆発による負傷

・1号機付近で爆発と発煙が発生した際に4名が1号タービン建屋付近（管理区域外）で負傷。川内診療所で診療。

3．福島第一原子力発電所3号機の爆発による負傷

・社員4名
・協力会社3名
・自衛隊4名（うち1名は内部被ばくの可能性を考慮し、「（独）放射線医学総合研究所」へ搬送。診察の結果内部被ばくはなし。3月16日退院）

4．その他の被害

・福島第二原子力発電所内の診療所に変電所から腹痛を訴える人が来たが、被ばくをしていないことからいわき市の診療所へ搬送。

＜住民避難の状況（3月23日19:00現在）＞

3月15日11:00、内閣総理大臣の指示により、福島第一原子力発電所半径20kmから30km圏内の住民に対して、屋内退避を指示。その旨を福島県及び関係自治体へ連絡。

福島第一原子力発電所20km圏外及び福島第二原子力発電所10km圏外への避難は、措置済。

・福島第一原子力発電所20kmから30km圏内の屋内退避について、徹

底中。
・福島県と連携して、屋内退避圏内の住民の生活支援等を実施。

＜飲食物への指示＞

３月２１日、原子力災害対策本部長から、下記の①、②について当分の間、出荷を控えるよう、関係事業者等に要請することの指示を福島県、茨城県、栃木県及び群馬県の各知事宛に発出。

①福島県、茨城県、栃木県及び群馬県において産出されたホウレンソウ及びカキナ

②福島県において産出された原乳

＜屋内退避圏内での暖房器具の使用に係る換気についての指示＞

３月２１日、原子力災害対策現地本部長から「屋内退避圏内での暖房器具の使用に係る換気について」として、一酸化炭素中毒等の防止の観点及び被ばく低減の観点から、屋内において換気を必要とする暖房器具を使用する場合の対応について屋内退避圏内の住民に周知する旨の指示を福島県知事及び市町村長（いわき市、田村市、南相馬市、広野町、川内村、浪江町、葛尾村、飯館村）宛に発出。

＜消防機関の活動状況＞

・３月２２日、11:00～14:00 頃：新潟市消防局及び浜松市消防局が大型除染システムの東京電力による設営を指導。

・３月２３日、8:30～9:30、13:30～14:30：新潟市消防局及び浜松市消防局が大型除染システムの東京電力による運用を指導。

（本発表資料のお問い合わせ）
原子力安全・保安院
原子力安全広報課：吉澤、金城
電話：０３－３５０１－１５０５
０３－３５０１－５８９０

（参考）

【東北地方太平洋沖地震】

１．災害概要

（１）発生日時：平成 23 年 3 月 11 日（金）　１４：４６発生

（２）発生場所：震源三陸沖（北緯 38 度、東経 142.9 度）
深さ 10km、マグニチュード 9.0

（３）各地の震度

○震度４以上の地域

震度７　宮城県北部

震度６強　茨城県北部、茨城県南部

震度５強　青森県三八上北

震度５弱　新潟県中越

震度４

○震度４以上の市町村

震度６強　福島県楢葉町、富岡町、大熊町、双葉町

震度６弱　宮城県石巻市、女川町（発電所の震度計による）、東海村

震度５弱　新潟県刈羽村

震度４　青森県六ケ所村、東通村、新潟県柏崎市、神奈川県横須賀市

震度１　北海道泊村

3月23日　　福島第一（1F）　　測定場所　　①事務本館北（2号機より北西約0．5キロ）　②体育館付近（MP－5東側）（2号機より西北西約0．9キロ）
③西門付近（MP-5付近）（2号機より西約1．1キロ）　④正門付近前（MP-6付近）（2号機より西南西約1．0キロ）

測定場所	④																							
Eニタリングカー	0:00	0:10	0:20	0:30	0:40	0:50	1:00	1:10	1:20	1:30	1:40	1:50	2:00	2:10	2:20	2:30	2:40	2:50	3:00	3:10	3:20	3:30	3:40	3:50
測定値(μSv/h)	233.4	233.3	232.3	231.6	230.1	229.4	227.5	227.4	227.2	226.8	226.8	226.7	226.7	226.9	227.1	227.1	227.2	227.3	227.6	228.5	228.7	228.8	228.8	229.0
中性子	N.D	N.D	N.D	N.D	N.D.	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
風向	北西	北西	北北西	西	北西	北東	北	北東	北北西	北北西	北北西	北	北	北	北西	北	北	北西	北北西	北	北北西	北北西	北	北西
風速(m/s)	1.8	1.8	2.6	4.3	2.5	5.5	2.4	6.5	6.0	4.2	3.4	3.3	3.2	2.8	2.8	2.9	3.0	3.1	2.9	2.2	2.3	2.3	2.6	2.2

測定場所	④																							
Eニタリングカー	4:00	4:10	4:20	4:30	4:40	4:50	5:00	5:10	5:20	5:30	5:40	5:50	6:00	6:10	6:20	6:30	6:40	6:50	7:00	7:10	7:20	7:30	7:40	7:50
測定値(μSv/h)	229.1	229.1	229.4	229.3	229.5	229.5	229.5	229.3	229.6	229.5	229.5	229.7	229.6	229.6	229.4	229.6	229.5	229.5	229.3	229.5	229.3	229.5	229.0	229.3
中性子	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
風向	北	北西	北北西	北西	北北西	北	北	北	北北西	北西	北北西	北西	北北西	北北西	北西	北北西	北西	北北西	北北西	北北西	北北西	北北西	北	北
風速(m/s)	2.1	2.1	2.4	1.7	1.8	2.1	2.1	1.8	2.2	2.1	2.2	2.4	2.5	2.5	2.6	2.7	2.4	2.1	2.7	2.4	2.6	2.8	3.0	2.5

測定場所	④																							
Eニタリングカー	8:00	8:10	8:20	8:30	8:40	8:50	9:00	9:10	9:20	9:30	9:40	9:50	10:00	10:10	10:20	10:30	10:40	10:50	11:00	11:10	11:20	11:30	11:40	11:50
測定値(μSv/h)	229.4	229.5	229.2	229.4	229.1	229.1	229.1	228.7	227.6	226.9	228.6	227.6	211.4	227.7	227.2	227.3	227.1	227.2	227.0	226.8	226.8	226.3	225.7	226.3
中性子	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
風向	北	北	北北西	北北西	北北西	北北西	北	北北東	北	北	北北東	北北東	北	北	北北東	北	北北西	北	北北西	北	北北東	北北東	北	北
風速(m/s)	3.1	3.2	3.5	3.9	4.4	3.1	3.5	3.3	2.9	3.4	2.5	3.1	2.6	2.7	3.1	2.9	2.9	3.1	3.0	2.6	2.5	2.1	2.2	1.5

測定場所	④																							
Eニタリングカー	12:00	12:10	12:20	12:30	12:40	12:50	13:00	13:10	13:20	13:30	13:40	13:50	14:00	14:10	14:20	14:30	14:40	14:50	15:00	15:10	15:20	15:30	15:40	15:50
測定値(μSv/h)	225.2																							
中性子	N.D																							
風向	北北西																							
風速(m/s)	1.6																							

測定場所	④																							
Eニタリングカー	16:00	16:10	16:20	16:30	16:40	16:50	17:00	17:10	17:20	17:30	17:40	17:50	18:00	18:10	18:20	18:30	18:40	18:50	19:00	19:10	19:20	19:30	19:40	19:50
測定値(μSv/h)																								
中性子																								
風向																								
風速(m/s)																								

測定場所	④																							
Eニタリングカー	20:00	20:10	20:20	20:30	20:40	20:50	21:00	21:10	21:20	21:30	21:40	21:50	22:00	22:10	22:20	22:30	22:40	22:50	23:00	23:10	23:20	23:30	23:40	23:50
測定値(μSv/h)																								
中性子																								
風向																								
風速(m/s)																								

3月22日　福島第一（1F）　測定場所　①事務本館北（2号機より北西約0．5キロ）　②体育館付近（MP－5東側）（2号機より西北西約0．9キロ）
③西門付近（MP-5付近）（2号機より西約1．1キロ）　④正門付近前（MP-6付近）（2号機より西南西約1．0キロ）

測定場所	④																							
ニタリングカー	0:00	0:10	0:20	0:30	0:40	0:50	1:00	1:10	1:20	1:30	1:40	1:50	2:00	2:10	2:20	2:30	2:40	2:50	3:00	3:10	3:20	3:30	3:40	3:50
測定値(μSv/h)	331.8	329.3	327.5	325.8	323.9	320.8	314.8	313.0	311.3	308.9	308.4	305.9	304.5	303.2	301.3	299.7	298.0	296.2	294.9	293.8	293.6	291.6	291.1	290.0
中性子	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
風向	南東	南西	西南西	西南西	西	西南西	西北西	西	西	西	西北西	西北西	西	西	西	西北西	西北西	北北西	北西	西北西	北西	西北西	西北西	西北西
風速(m/s)	0.4	0.4	0.4	0.4	0.3	0.4	0.6	0.5	0.4	0.7	0.8	1.0	1.1	1.3	1.1	0.8	1.0	1.0	0.9	1.0	0.9	0.9	0.8	0.8

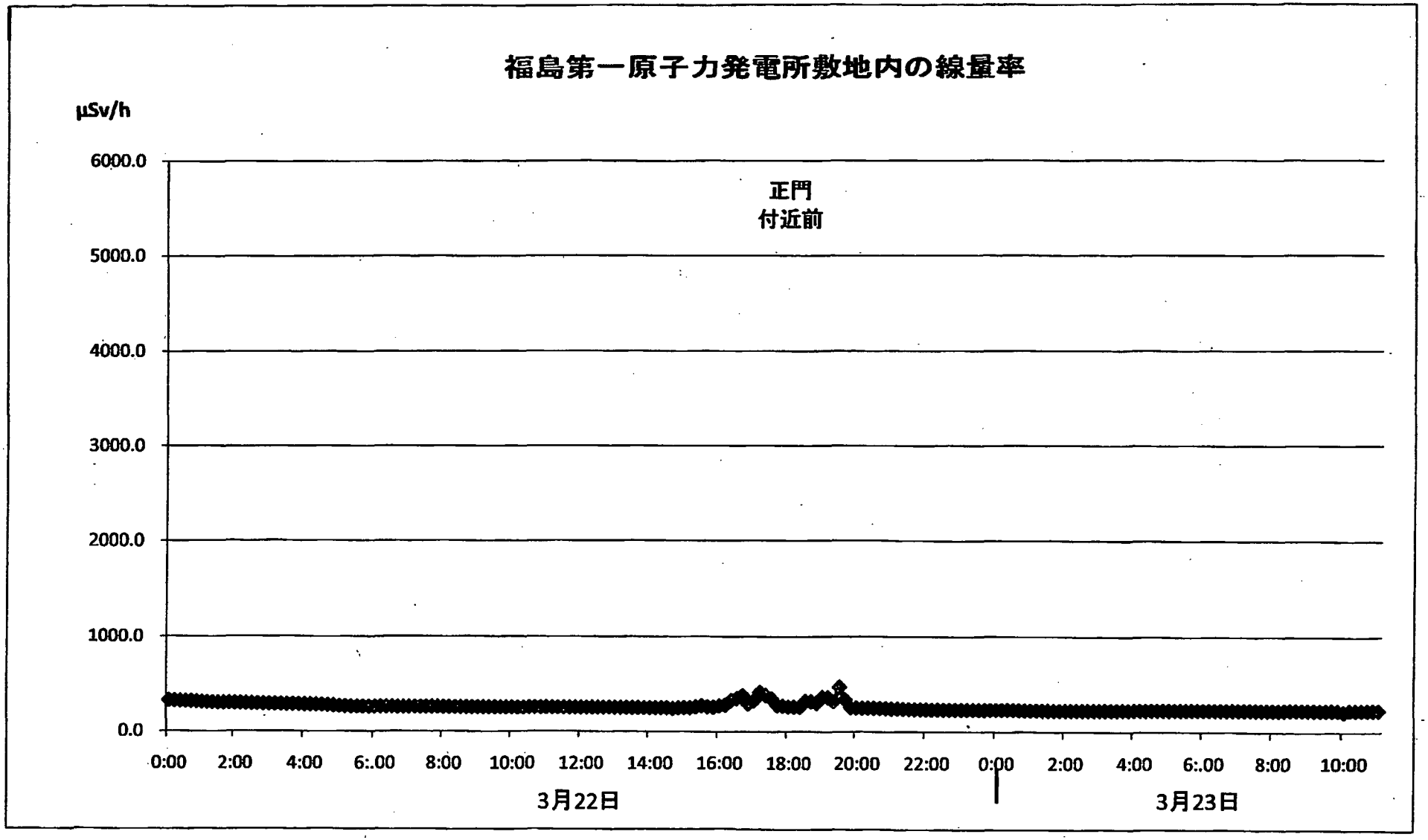
測定場所	④																							
ニタリングカー	4:00	4:10	4:20	4:30	4:40	4:50	5:00	5:10	5:20	5:30	5:40	5:50	6:00	6:10	6:20	6:30	6:40	6:50	7:00	7:10	7:20	7:30	7:40	7:50
測定値(μSv/h)	288.9	288.1	287.0	286.0	283.6	280.1	273.9	271.0	268.0	267.4	265.8	265.3	264.6	264.3	265.5	263.7	262.6	262.1	261.9	261.8	261.7	261.6	261.2	261.0
中性子	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
風向	西北西	西	北西	北北西	北	北西	北西	北西	西	北西	西	西	北	北西	西	西北西	西北西	北西	西北西	北西	西北西	北西	西北西	西北西
風速(m/s)	0.8	0.6	0.5	0.4	2.1	1.1	2.0	1.8	1.6	1.9	1.7	1.6	1.3	1.3	1.5	1.8	2.3	2.3	1.8	2.0	1.9	1.8	2.2	2.4

測定場所	④																							
ニタリングカー	8:00	8:10	8:20	8:30	8:40	8:50	9:00	9:10	9:20	9:30	9:40	9:50	10:00	10:10	10:20	10:30	10:40	10:50	11:00	11:10	11:20	11:30	11:40	11:50
測定値(μSv/h)	260.9	260.8	260.5	260.3	260.4	260.2	260.2	260.1	260.0	259.9	259.4	258.5	260.2	259.4	258.9	258.7	258.4	257.3	257.5	257.1	256.9	256.5	256.5	256.4
中性子	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
風向	西北西	西	西	西	北西	西	西	北西	西北西	北西	西	西北西	西北西	北西	西北西	北西	北	北北西	北北西	北	北北西	西	北北西	北北西
風速(m/s)	1.8	1.4	1.5	1.4	1.2	1.1	1.5	1.3	1.1	1.5	1.7	1.8	1.8	1.3	1.4	1.5	1.5	1.6	1.7	2.2	1.3	1.7	1.5	2.3

測定場所	④																							
ニタリングカー	12:00	12:10	12:20	12:30	12:40	12:50	13:00	13:10	13:20	13:30	13:40	13:50	14:00	14:10	14:20	14:30	14:40	14:50	15:00	15:10	15:20	15:30	15:40	15:50
測定値(μSv/h)	256.3	256.0	256.1	256.3	255.6	255.8	255.6	255.7	255.2	254.8	254.8	254.5	254.6	254.3	254.4	254.3	244.3	254.4	254.1	255.3	265.7	277.5	265.2	258.8
中性子	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
風向	北	北	北	北西	北	北北西	北	北	北東	北北西	北	北	北西	北西	北	北	西北西	北	北東	北西	北	東南東	東	東
風速(m/s)	1.5	1.4	1.3	1.3	1.7	1.4	1.8	1.6	1.4	1.5	2.3	2.1	1.6	1.7	1.8	1.6	1.6	1.2	1.2	0.8	1.0	1.0	1.2	0.7

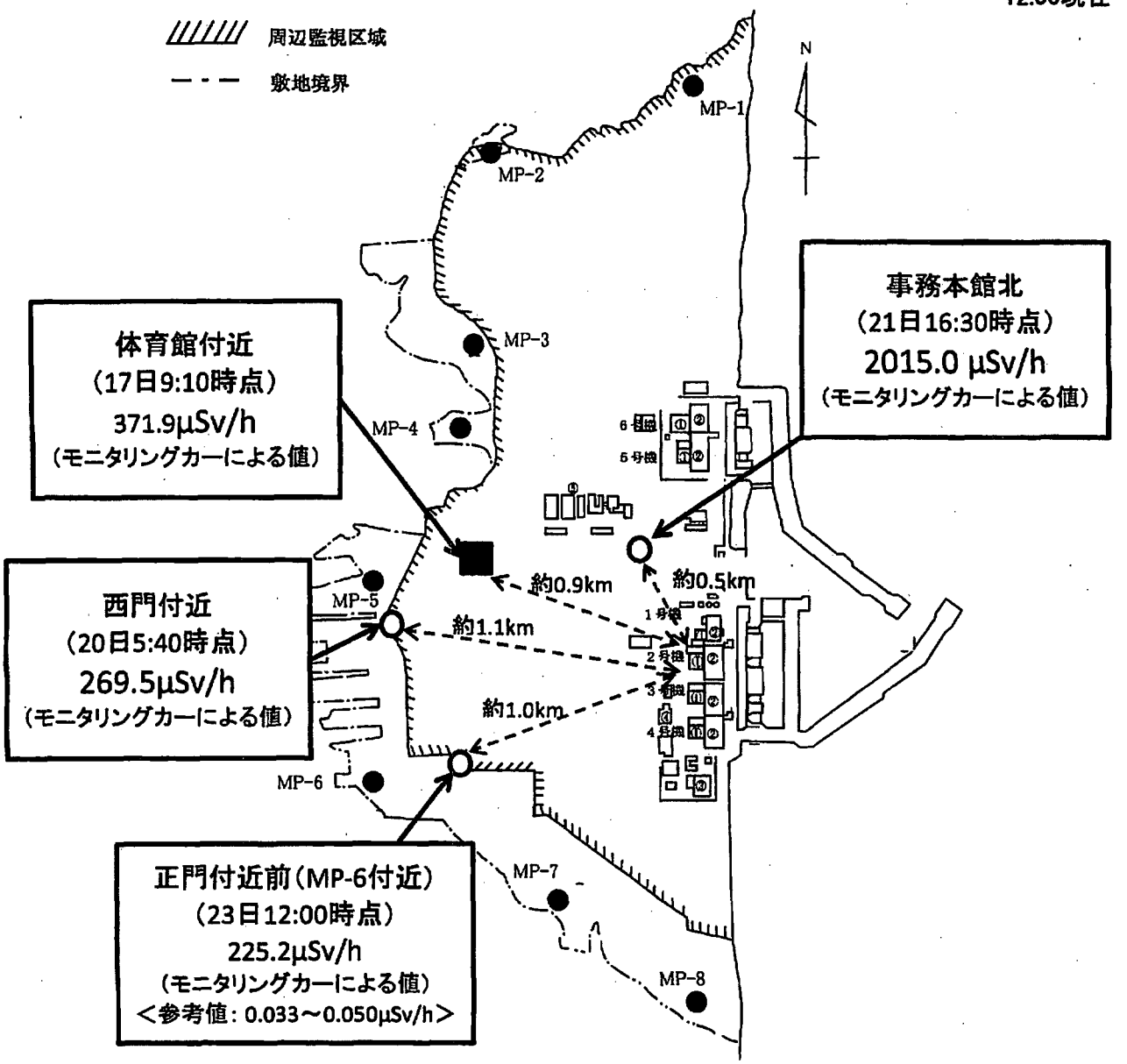
測定場所	④																							
ニタリングカー	16:00	16:10	16:20	16:30	16:40	16:50	17:00	17:10	17:20	17:30	17:40	17:50	18:00	18:10	18:20	18:30	18:40	18:50	19:00	19:10	19:20	19:30	19:40	19:50
測定値(μSv/h)	274.0	280.6	330.6	352.3	384.2	294.0	330.8	420.4	388.7	351.6	278.9	275.2	265.5	264.1	261.5	324.6	322.8	303.8	367.9	363.1	320.9	472.7	340.7	258.0
中性子	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
風向	東	南西	南西	西	北北東	北	南東	南東	北	北東	北北西	西北西	西	西北西	北西	西	西	北北西	南西	南西	西南西	南西	西	西北西
風速(m/s)	0.7	0.7	0.6	0.6	0.6	0.6	0.4	0.4	0.2	0.4	0.5	0.6	0.9	0.6	0.4	0.6	0.3	0.5	0.3	0.5	0.4	0.5	0.6	0.9

測定場所	④																							
ニタリングカー	20:00	20:10	20:20	20:30	20:40	20:50	21:00	21:10	21:20	21:30	21:40	21:50	22:00	22:10	22:20	22:30	22:40	22:50	23:00	23:10	23:20	23:30	23:40	23:50
測定値(μSv/h)	254.1	253.4	252.5	251.5	250.5	249.1	246.1	244.4	242.8	241.0	240.6	239.5	239.3	237.0	237.4	236.2	235.7	235.8	235.9	235.9	235.5	234.8	234.1	233.8
中性子	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
風向	西北西	西	西北西	北西	北西	西	西	南西	西	西	北西	西北西	西北西	西	西	西南西	西北西	西	西	西北西	西北西	西北西	西北西	北西
風速(m/s)	1.0	1.0	0.8	0.6	0.9	0.8	0.6	0.4	0.5	0.6	0.7	1.0	1.2	1.3	1.1	0.8	1.0	0.9	1.2	1.4	1.4	1.5	1.5	1.9


福島第一原子力発電所敷地内の線量率
μSv/h
6000.0
5000.0
4000.0
3000.0
2000.0
1000.0
0.0
正門
付近前
0:00
2:00
4:00
6:.00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
2:00
4:00
6:.00
8:00
10:00
3月22日
3月23日

福島第一原子力発電所

2011/3/23
12:00現在



島第二(2F)(事業者のモニタリングポスト)

3月23日																								
ニタリングポスト	12:00	12:10	12:20	12:30	12:40	12:50	13:00	13:10	13:20	13:30	13:40	13:50	14:00	14:10	14:20	14:30	14:40	14:50	15:00	15:10	15:20	15:30	15:40	15
MP1(μSv/h)	15.023																							
MP2(μSv/h)	8.987																							
MP3(μSv/h)	15.070																							
MP4(μSv/h)	11.590																							
MP5(μSv/h)	10.973																							
MP6(μSv/h)	11.943																							
MP7(μSv/h)	欠測																							
風向	北																							
風速(m/s)	6.0																							

3月23日																								
ニタリングポスト	16:00	16:10	16:20	16:30	16:40	16:50	17:00	17:10	17:20	17:30	17:40	17:50	18:00	18:10	18:20	18:30	18:40	18:50	19:00	19:10	19:20	19:30	19:40	19
MP1(μSv/h)																								
MP2(μSv/h)																								
MP3(μSv/h)																								
MP4(μSv/h)																								
MP5(μSv/h)																								
MP6(μSv/h)																								
MP7(μSv/h)																								
風向																								
風速(m/s)																								

3月23日																								
ニタリングポスト	20:00	20:10	20:20	20:30	20:40	20:50	21:00	21:10	21:20	21:30	21:40	21:50	22:00	22:10	22:20	22:30	22:40	22:50	23:00	23:10	23:20	23:30	23:40	23
MP1(μSv/h)																								
MP2(μSv/h)																								
MP3(μSv/h)																								
MP4(μSv/h)																								
MP5(μSv/h)																								
MP6(μSv/h)																								
MP7(μSv/h)																								
風向																								
風速(m/s)																								

島第二(2F)（事業者のモニタリングポスト）

3月23日 ニタリングポスト	0:00	0:10	0:20	0:30	0:40	0:50	1:00	1:10	1:20	1:30	1:40	1:50	2:00	2:10	2:20	2:30	2:40	2:50	3:00	3:10	3:20	3:30	3:40	3
MP1(μSv/h)	16.337	16.260	16.067	16.060	15.887	15.700	15.660	15.570	15.537	15.470	15.393	15.410	15.290	15.243	15.180	15.190	15.103	15.083	15.000	14.953	14.953	14.953	14.907	14.8
MP2(μSv/h)	9.703	9.627	9.560	9.447	9.333	9.233	9.193	9.177	9.113	9.080	9.043	8.973	8.960	8.980	8.960	8.907	8.897	8.877	8.867	8.837	8.837	8.837	8.797	8.8
MP3(μSv/h)	15.347	15.200	15.130	15.047	14.967	14.833	14.790	14.803	14.737	14.650	14.603	14.570	14.540	14.500	14.490	14.517	14.477	14.433	14.383	14.350	14.350	14.350	14.310	14.3
MP4(μSv/h)	12.243	12.123	12.060	11.937	11.847	11.797	11.750	11.723	11.667	11.650	11.557	11.547	11.527	11.453	11.487	11.460	11.417	11.413	11.403	11.367	11.367	11.367	11.307	11.3
MP5(μSv/h)	11.467	11.367	11.267	11.167	11.040	10.973	10.880	10.873	10.873	10.780	10.760	10.680	10.680	10.680	10.680	10.680	10.673	10.627	10.593	10.580	10.580	10.580	10.580	10.5
MP6(μSv/h)	12.620	12.503	12.407	12.297	12.187	12.103	12.053	12.007	11.930	11.900	11.810	11.820	11.793	11.823	11.770	11.763	11.713	11.743	11.703	11.697	11.697	11.697	11.687	11.6
MP7(μSv/h)	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠
風向	北北西	北西	北北西	北西	北西	北北西	北北西	北	北	北	北	北	北	北	北	北北西	北	北	北	北	北	北	北	北北
風速(m/s)	2.7	3.9	5.0	4.8	4.4	4.3	4.5	5.7	6.6	8.2	8.2	7.4	9.1	8.6	9.9	8.4	9.7	9.0	9.9	7.7	7.7	7.7	8.6	8

3月23日 ニタリングポスト	4:00	4:10	4:20	4:30	4:40	4:50	5:00	5:10	5:20	5:30	5:40	5:50	6:00	6:10	6:20	6:30	6:40	6:50	7:00	7:10	7:20	7:30	7:40	7:
MP1(μSv/h)	14.860	14.797	14.773	14.723	14.740	14.713	14.630	14.670	14.593	14.577	14.553	14.423	14.520	14.507	14.460	14.450	14.467	14.400	14.403	14.380	14.347	14.390	14.343	14.33
MP2(μSv/h)	8.813	8.787	8.790	8.803	8.773	8.737	8.740	8.713	8.723	8.700	8.683	8.680	8.640	8.657	8.653	8.643	8.620	8.603	8.593	8.570	8.603	8.570	8.570	8.56
MP3(μSv/h)	14.293	14.317	14.250	14.260	14.260	14.213	14.227	14.223	14.170	14.117	14.173	14.167	14.123	14.133	14.093	14.080	14.060	14.027	14.057	14.053	13.987	14.007	14.017	13.98
MP4(μSv/h)	11.313	11.313	11.273	11.253	11.260	11.263	11.237	11.220	11.193	11.193	11.197	11.153	11.173	11.170	11.133	11.153	11.127	11.130	11.113	11.080	11.097	11.117	11.050	11.05
MP5(μSv/h)	10.587	10.587	10.587	10.587	10.480	10.520	10.480	10.480	10.480	10.480	10.487	10.480	10.433	10.480	10.480	10.427	10.387	10.407	10.380	10.387	10.387	10.387	10.380	10.38
MP6(μSv/h)	11.630	11.643	11.620	11.600	11.623	11.597	11.580	11.550	11.607	11.580	11.533	11.577	11.567	11.510	11.487	11.497	11.480	11.487	11.480	11.480	11.450	11.423	11.417	11.46
MP7(μSv/h)	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠
風向	北	北	北	北	北	北	北	北	北	北	北	北	北	北	北	北	北	北	北	北	北	北	北	北
風速(m/s)	8.6	8.5	8.0	7.8	8.3	7.7	7.5	7.1	7.6	7.5	8.7	8.6	8.2	8.7	9.1	8.5	9.9	8.9	9.6	8.6	8.6	8.0	9.4	8.

3月23日 ニタリングポスト	8:00	8:10	8:20	8:30	8:40	8:50	9:00	9:10	9:20	9:30	9:40	9:50	10:00	10:10	10:20	10:30	10:40	10:50	11:00	11:10	11:20	11:30	11:40	11:
MP1(μSv/h)	14.307	15.697	16.200	19.693	17.380	17.463	16.780	16.483	16.347	16.143	16.010	15.917	15.783	15.657	15.590	15.533	15.453	15.407	15.323	15.187	15.380	15.260	15.133	15.07
MP2(μSv/h)	8.573	8.923	9.273	11.147	10.563	10.817	9.570	9.350	9.277	9.197	9.190	9.097	9.057	9.067	9.067	9.027	8.983	8.943	8.903	8.917	9.307	9.120	9.077	8.96
MP3(μSv/h)	13.953	13.980	14.407	15.590	17.423	18.627	17.130	16.520	16.220	16.110	15.933	15.813	15.693	15.613	15.510	15.453	15.397	15.447	15.227	15.357	15.853	15.540	15.277	15.16
MP4(μSv/h)	11.060	11.077	11.377	13.130	13.253	13.147	12.330	12.273	12.070	12.013	11.920	11.873	11.780	11.750	11.770	11.667	11.737	11.787	11.657	11.693	11.933	12.607	11.713	11.70
MP5(μSv/h)	10.380	10.380	10.613	13.813	12.420	12.147	11.567	11.620	11.367	11.367	11.213	11.167	11.153	11.113	11.073	11.073	11.053	11.173	10.920	11.220	11.287	11.713	11.153	11.06
MP6(μSv/h)	11.443	11.463	12.017	14.217	13.800	12.843	12.550	12.540	12.447	12.383	12.273	12.233	12.183	12.117	12.127	12.083	12.073	11.997	11.940	11.970	12.023	12.107	11.987	11.97
MP7(μSv/h)	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠
風向	北	北	北	北	北	北北東	北北東	北北東	北北東	北北東	北北東	北北東	北北東	北北東	北北東	北北東	北北東	北北東	北北東	北北東	北北東	北	北北東	北北
風速(m/s)	7.7	8.1	7.9	7.4	7.2	7.7	9.0	8.9	10.2	10.3	8.2	8.2	9.2	10.1	7.5	7.0	7.7	8.0	7.4	7.1	8.6	6.0	5.4	6.

島第二(2F)(事業者のモニタリングポスト)

3月22日																		※					
ニタリングポスト	12:00	12:10	12:20	12:30	12:40	12:50	13:00	13:10	13:20	13:30	13:40	13:50	14:00	14:10	14:20	14:30	14:40	14:50	15:00	15:10	15:20	15:30	15:40	15:
MP1(μSv/h)	15.103	15.147	15.120	15.067	15.027	15.040	14.980	14.947	14.977	14.970	15.043	17.023	27.080	37.954	50.240	49.404	42.264	43.274	49.137	35.667	34.847	33.027	32.030	31.0
MP2(μSv/h)	9.217	9.213	9.197	9.227	9.197	9.213	9.183	9.227	9.173	9.157	9.197	10.097	11.110	35.497	42.387	39.347	30.564	30.410	27.444	20.557	18.973	17.087	16.583	16.1
MP3(μSv/h)	14.963	14.973	15.007	14.977	14.987	14.977	14.900	14.933	14.960	14.917	14.880	14.883	15.180	15.433	33.410	37.620	35.400	35.664	30.900	33.897	26.187	24.477	23.590	23.0
MP4(μSv/h)	12.027	11.980	11.987	11.970	11.970	11.987	11.920	11.937	11.963	11.907	11.910	11.887	12.113	15.360	33.177	35.780	35.740	29.424	26.357	28.927	21.004	19.737	19.027	18.6
MP5(μSv/h)	11.373	11.413	11.407	11.373	11.373	11.367	11.360	11.367	11.373	11.300	11.307	11.307	11.467	17.693	33.207	37.767	38.960	28.980	26.987	28.667	20.473	19.000	18.293	17.8
MP6(μSv/h)	12.657	12.613	12.610	12.617	12.547	12.567	12.520	12.470	12.460	12.473	12.450	12.460	12.770	18.403	28.297	30.274	33.717	27.834	26.014	28.264	21.794	19.733	19.287	18.9
MP7(μSv/h)	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	22.200	欠測	欠測	欠測	欠測	欠
風向	北北西	北	北	北	北	北北西	北	北	北	北	北北東	北	北	北北東	北北東	北北東	北北東	北東	北東	北東	北東	北北東	北東	北北
風速(m/s)	3.0	2.5	2.9	2.9	3.3	2.5	2.7	3.4	4.3	3.9	3.5	2.8	2.5	1.9	2.6	3.1	2.9	3.5	2.9	3.0	2.8	2.5	3.7	3

※:MP-7については、東電社員が測定結果(1日1回)

3月22日																								
ニタリングポスト	16:00	16:10	16:20	16:30	16:40	16:50	17:00	17:10	17:20	17:30	17:40	17:50	18:00	18:10	18:20	18:30	18:40	18:50	19:00	19:10	19:20	19:30	19:40	19:
MP1(μSv/h)	30.194	29.330	28.520	27.770	27.084	26.500	25.877	25.320	24.860	24.367	23.884	23.410	23.047	22.627	22.197	21.837	21.500	21.197	20.874	20.630	20.287	20.010	19.763	19.62
MP2(μSv/h)	15.743	15.413	15.080	14.743	14.447	14.173	13.870	13.667	13.443	13.183	13.010	12.800	12.597	12.487	12.297	12.100	11.967	11.820	11.683	11.543	11.457	11.283	11.190	11.11
MP3(μSv/h)	22.657	22.204	21.840	21.460	21.134	20.777	20.493	20.263	19.883	19.713	19.417	19.180	18.933	18.823	18.627	18.357	18.187	18.027	17.870	17.700	17.607	17.433	17.290	17.14
MP4(μSv/h)	18.280	17.893	17.583	17.303	17.030	16.783	16.483	16.317	16.057	15.803	15.623	15.420	15.250	15.040	14.913	14.727	14.607	14.487	14.340	14.173	14.023	13.947	13.830	13.71
MP5(μSv/h)	17.500	17.200	16.820	16.520	16.227	15.927	15.680	15.487	15.307	15.053	14.860	14.667	14.467	14.267	14.173	13.980	13.880	13.680	13.587	13.433	13.293	13.193	13.113	13.00
MP6(μSv/h)	18.600	18.307	17.973	17.660	17.433	17.183	16.973	16.667	16.460	16.240	16.057	15.850	15.667	15.480	15.310	15.230	15.023	14.897	14.793	14.640	14.507	14.393	14.287	14.14
MP7(μSv/h)	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測
風向	北東	北北東	北東	北東	北東	東北東	北東	北東	北北西	西北西	西	北北西	西	西	北	北	北	北	北	北西	北	北北西	北	北北
風速(m/s)	3.3	3.3	2.7	2.7	2.2	1.9	1.8	0.4	0.5	0.5	4.6	1.0	4.8	0.4	0.7	1.1	0.8	1.1	1.2	1.1	0.9	1.1	0.8	1.

3月22日																								
ニタリングポスト	20:00	20:10	20:20	20:30	20:40	20:50	21:00	21:10	21:20	21:30	21:40	21:50	22:00	22:10	22:20	22:30	22:40	22:50	23:00	23:10	23:20	23:30	23:40	23:
MP1(μSv/h)	19.557	19.463	19.583	19.733	19.363	19.537	19.217	19.027	18.700	18.907	18.427	18.640	18.320	18.220	17.957	17.563	17.307	17.107	16.927	16.773	16.727	16.667	16.560	16.44
MP2(μSv/h)	11.127	11.187	11.370	11.503	11.463	11.633	11.477	11.300	11.140	11.340	10.900	11.167	11.003	10.987	10.757	10.447	10.250	10.150	10.013	9.917	9.903	9.840	9.820	9.72
MP3(μSv/h)	17.057	17.000	17.090	17.240	17.183	16.990	17.300	16.850	16.700	16.787	16.760	16.457	16.520	16.523	16.363	16.127	16.037	15.893	15.777	15.667	15.603	15.523	15.537	15.39
MP4(μSv/h)	13.637	13.550	13.650	13.823	13.770	13.820	13.877	13.723	13.543	13.483	13.500	13.163	13.297	13.167	13.100	13.003	12.863	12.727	12.590	12.517	12.427	12.420	12.373	12.34
MP5(μSv/h)	12.900	12.800	12.900	13.100	13.100	13.253	13.327	13.387	12.987	12.853	12.800	12.507	12.527	12.347	12.413	12.347	12.147	11.953	11.907	11.753	11.660	11.620	11.573	11.62
MP6(μSv/h)	14.057	13.970	13.943	14.077	14.117	14.160	14.080	14.197	13.910	13.867	13.717	13.680	13.523	13.470	13.437	13.400	13.247	13.113	13.003	12.917	12.827	12.760	12.730	12.72
MP7(μSv/h)	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測
風向	西北西	北西	北	北	西北西	西北西	北北西	北北西	北北西	北	北北西	北西	北北西	北西	北西	北西	北西	北西	西北西	北西	西南西	西北西	西	北西
風速(m/s)	4.0	1.9	2.0	1.4	5.2	3.2	2.0	2.2	2.6	2.4	2.1	1.9	2.4	2.7	2.8	3.3	2.7	3.0	3.2	3.2	1.8	1.8	1.3	2.

島第二(2F)(事業者のモニタリングポスト)

3月22日																							
ニタリングポスト	0:00	0:10	0:20	0:30	0:40	0:50	1:00	1:10	1:20	1:30	1:40	1:50	2:00	2:10	2:20	2:30	2:40	2:50	3:00	3:10	3:20	3:30	3:40	3
MP1(μSv/h)	18.187	17.870	17.880	17.917	17.953	18.153	18.277	18.007	17.667	17.497	17.463	17.847	17.840	17.403	17.263	16.903	16.943	16.653	16.497	16.440	16.373	16.323	16.243	16.1
MP2(μSv/h)	11.920	11.683	11.673	11.567	11.743	11.840	12.010	11.733	11.423	11.327	11.247	11.480	11.767	11.397	11.183	10.850	10.817	10.643	10.500	10.420	10.357	10.340	10.233	10.2
MP3(μSv/h)	17.570	17.423	17.453	17.397	17.437	17.643	17.567	17.437	17.240	17.110	17.057	17.077	17.330	17.393	17.010	16.920	16.670	16.637	16.450	16.380	16.340	16.313	16.247	16.1
MP4(μSv/h)	14.283	14.293	14.587	14.500	14.577	14.530	14.503	14.527	14.400	14.090	13.870	13.793	13.983	14.387	13.973	13.903	13.507	13.600	13.300	13.250	13.143	13.110	13.090	13.0
MP5(μSv/h)	14.573	14.367	14.860	14.567	14.667	14.653	14.513	14.473	14.567	14.207	13.920	13.713	13.833	14.367	13.880	13.820	13.293	13.467	13.000	12.900	12.800	12.753	12.700	12.6
MP6(μSv/h)	14.930	14.730	14.793	14.837	14.793	14.723	14.670	14.740	14.607	14.467	14.173	14.033	14.193	14.560	14.147	14.113	13.717	13.893	13.570	13.460	13.413	13.387	13.333	13.3
MP7(μSv/h)	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠
風向	西	西北西	西	西	西	西	西北西	西	西	西南西	西	西南西	北北西	北	北北西	西	北北西	北北西	北北西	西	北北西	北	北	北
風速(m/s)	6.3	1.6	2.9	1.5	8.8	8.2	1.8	4.4	4.6	1.1	4.1	2.0	0.9	2.3	0.8	2.6	1.7	2.7	1.1	4.4	1.1	1.9	2.2	2

3月22日																							
ニタリングポスト	4:00	4:10	4:20	4:30	4:40	4:50	5:00	5:10	5:20	5:30	5:40	5:50	6:00	6:10	6:20	6:30	6:40	6:50	7:00	7:10	7:20	7:30	7:40	7
MP1(μSv/h)	16.160	16.140	16.100	16.213	17.327	19.673	18.193	18.620	18.310	17.980	17.803	17.690	17.463	17.250	17.173	17.103	16.910	16.763	16.683	16.490	16.463	16.440	16.380	16.2
MP2(μSv/h)	10.180	10.147	10.083	10.187	11.027	13.457	11.027	11.367	11.100	10.963	10.833	10.730	10.620	10.477	10.447	10.327	10.263	10.147	10.093	9.977	9.937	9.923	9.913	9.8
MP3(μSv/h)	16.153	16.177	16.073	16.160	17.037	16.577	16.457	16.650	16.673	16.573	16.483	16.380	16.237	16.157	16.093	15.983	16.017	15.880	15.800	15.710	15.777	15.673	15.667	15.5
MP4(μSv/h)	12.987	12.930	12.937	12.930	14.000	13.177	13.283	14.240	14.133	13.963	13.860	13.773	13.853	13.507	13.357	13.357	13.180	13.057	13.033	12.907	12.847	12.820	12.780	12.7
MP5(μSv/h)	12.607	12.527	12.507	12.507	13.433	13.040	12.940	14.160	13.993	13.687	13.580	13.413	13.200	13.087	13.000	12.860	12.700	12.607	12.507	12.373	12.347	12.293	12.247	12.2
MP6(μSv/h)	13.270	13.193	13.193	13.217	13.743	13.897	14.467	17.233	16.990	16.603	16.287	16.023	15.823	15.470	15.340	15.130	14.967	14.783	14.673	14.397	14.300	14.220	14.150	14.0
MP7(μSv/h)	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠
風向	北	北	北北東	北北東	北	北	北	北北西	北北西	北北西	北北西	北北西	北北西	北北西	北北西	北北西	北北西	北北西	北北西	北北西	北北西	北北西	北北西	北北
風速(m/s)	1.5	0.8	2.2	3.7	4.3	4.6	4.9	6.1	7.1	7.3	6.8	8.0	5.8	5.7	5.5	6.6	7.2	5.9	6.6	7.8	6.8	6.9	6.9	6

3月22日																							
ニタリングポスト	8:00	8:10	8:20	8:30	8:40	8:50	9:00	9:10	9:20	9:30	9:40	9:50	10:00	10:10	10:20	10:30	10:40	10:50	11:00	11:10	11:20	11:30	11:40	11:
MP1(μSv/h)	16.220	16.107	16.087	16.007	15.910	15.913	15.847	15.787	15.760	15.737	15.663	15.593	15.550	15.510	15.387	15.413	15.330	15.340	15.300	15.247	15.220	15.183	15.130	15.15
MP2(μSv/h)	9.823	9.770	9.743	9.730	9.667	9.697	9.633	9.637	9.580	9.580	9.547	9.533	9.520	9.470	9.423	9.403	9.323	9.323	9.317	9.300	9.283	9.283	9.263	9.26
MP3(μSv/h)	15.567	15.550	15.563	15.440	15.477	15.450	15.447	15.377	15.333	15.350	15.313	15.333	15.323	15.243	15.193	15.117	15.103	15.127	15.107	15.020	15.033	15.080	15.067	15.01
MP4(μSv/h)	12.700	12.643	12.583	12.587	12.560	12.523	12.497	12.447	12.467	12.423	12.387	12.370	12.370	12.290	12.213	12.160	12.170	12.100	12.137	12.113	12.043	12.053	12.037	12.00
MP5(μSv/h)	12.153	12.127	12.060	12.047	11.960	11.953	11.953	11.947	11.893	11.907	11.853	11.807	11.760	11.753	11.660	11.660	11.560	11.467	11.467	11.467	11.467	11.433	11.407	11.38
MP6(μSv/h)	13.970	13.843	13.780	13.707	13.660	13.600	13.537	13.467	13.443	13.350	13.360	13.300	13.230	13.180	13.093	13.003	12.923	12.883	12.813	12.767	12.790	12.737	12.720	12.67
MP7(μSv/h)	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠測	欠
風向	北北西	北西	北西	北西	北西	北西	北西	北北西	北北西	北北西	北北西	北	北北西	北北西	北北西	北北西	南西	北	北北西	北	北	北	北北西	北北
風速(m/s)	6.5	6.5	6.8	6.6	5.4	4.9	3.8	4.7	4.2	3.6	3.9	4.0	2.8	2.1	3.3	3.8	1.4	3.0	3.3	2.9	3.0	3.5	2.5	3.

福島第二原子力発電所

2011/3/23
12:00現在

MP1：15.023μSv/h
（参考値:0.035～0.054μSv/h）

MP2：8.987μSv/h
（参考値:0.042～0.062μSv/h）

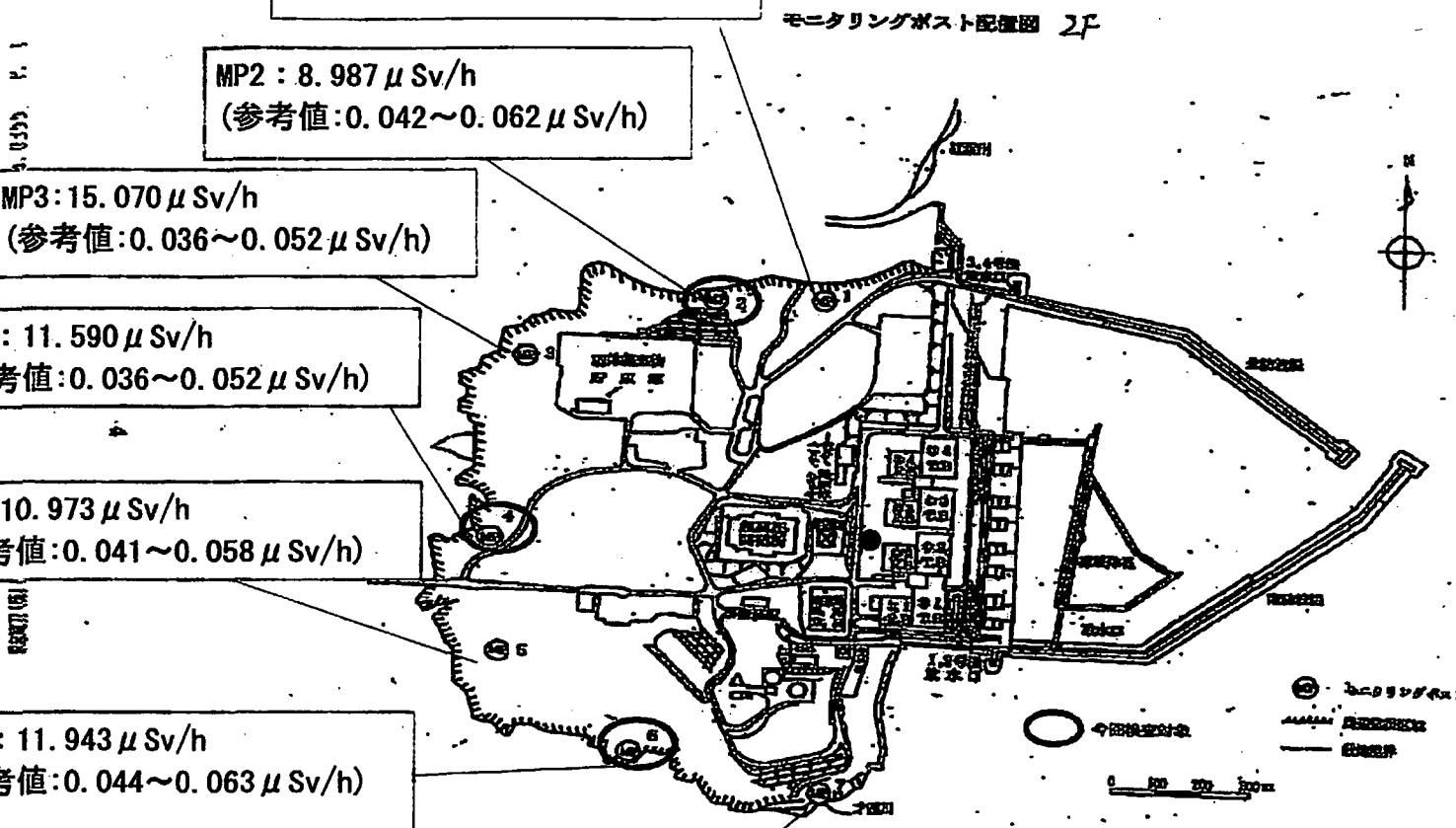
MP3:15.070μSv/h
（参考値:0.036～0.052μSv/h）

MP4：11.590μSv/h
（参考値:0.036～0.052μSv/h）

MP5:10.973μSv/h
（参考値:0.041～0.058μSv/h）

MP6：11.943μSv/h
（参考値:0.044～0.063μSv/h）

MP7：欠測
（参考値:0.043～0.062μSv/h）



東京電力福島第一原子力発電所敷地内の核種分析結果

採取方法：モニタリングカーにてダスト採取
測定方法：試料を2Fに持ち込みGe半導体型核種分析装置にて分析（1日1回測定）
測定時間：500秒

核種		3月19日 事務本館北側 採取時間(11:53～12:13)＊放水前 測定時間(14:12～)			3月20日 事務本館北側 採取時間(1:41～2:01) 測定時間(13:28～)			3月21日 事務本館北側 採取時間(10:19～10:39) 測定時間(13:28～)			③放射線業務従事者の呼吸する空気中の濃度限度 (Bq/cm^3)※
		①放射能濃度 (Bq/cm^3)	②検出限界濃度 (Bq/cm^3)	空気中濃度限度に対する割合 (①/③)	①放射能濃度 (Bq/cm^3)	②検出限界濃度 (Bq/cm^3)	空気中濃度限度に対する割合 (①/③)	①放射能濃度 (Bq/cm^3)	②検出限界濃度 (Bq/cm^3)	空気中濃度限度に対する割合 (①/③)	
揮発性	I-131	5.940E-03	3.374E-05	5.94	2.303E-03	1.256E-05	2.30	1.516E-03	1.134E-05	1.52	1.0E-03
	I-132	2.203E-03	8.816E-05	0.03	N.D			2.539E-04	2.702E-05	0.00	7.0E-02
	I-133	3.773E-05	2.861E-05	0.01	N.D			N.D			5.0E-03
粒子状	Cs-134	2.165E-05	1.692E-05	0.01	2.840E-05	4.755E-06	0.01	3.383E-05	5.364E-06	0.02	2.0E-03
	Cs-136	N.D			5.629E-06	5.447E-06	0.001	4.529E-06	3.321E-06	0.0005	1.0E-02
	Cs-137	2.437E-05	1.771E-05	0.01	2.892E-05	5.003E-06	0.01	3.801E-05	4.671E-06	0.01	3.0E-03

核種		3月22日 正門 採取時間(1:10～1:30) 測定時間(14:50～)									③放射線業務従事者の呼吸する空気中の濃度限度 (Bq/cm^3)※
		①放射能濃度 (Bq/cm^3)	②検出限界濃度 (Bq/cm^3)	空気中濃度限度に対する割合 (①/③)	①放射能濃度 (Bq/cm^3)	②検出限界濃度 (Bq/cm^3)	空気中濃度限度に対する割合 (①/③)	①放射能濃度 (Bq/cm^3)	②検出限界濃度 (Bq/cm^3)	空気中濃度限度に対する割合 (①/③)	
揮発性	I-131	2.239E-03	1.569E-05	2.24							1.0E-03
	I-132	N.D									7.0E-02
	I-133	N.D									5.0E-03
粒子状	Co-58	N.D									1.0E-02
	Cs-134	1.591E-05	5.853E-06	0.01							2.0E-03
	Cs-136	N.D									1.0E-02
	Cs-137	1.889E-05	5.295E-06	0.01							3.0E-03
その他	Te-129	N.D									4.0E-01
	Te-132	6.680E-05	1.116E-05	0.01							7.0E-03

※人が呼吸する空気中の放射性核種の3ヶ月間についての平均濃度に対して、法令にて定められている濃度限度

採取方法:海水を汲みあげ採取
測定方法:試料500mlを福島第二に運搬し、Ge半導体検出器で測定
測定時間:1,000秒

核種	3月21日 14:30 1F南放水口付近(1～4u放水口から南側約330m地点)			3月22日 6:30 1F南放水口付近(1～4u放水口から南側約330m地点)						③周辺監視区域外の水中の濃度限度 (Bq/cm^3)
	①放射能濃度 (Bq/cm^3)	②検出限界濃度 (Bq/cm^3)	水中濃度限度に対する割合 (①/③)	①放射能濃度 (Bq/cm^3)	②検出限界濃度 (Bq/cm^3)	水中濃度限度に対する割合 (①/③)	①放射能濃度 (Bq/cm^3)	②検出限界濃度 (Bq/cm^3)	水中濃度限度に対する割合 (①/③)	
Co-58	5.955E-02	3.349E-02	0.1	1.668E-02	2.138E-02	0.0				1.0E+00
I-131	5.066E+00	4.245E-02	126.7	1.190E+00	2.293E-02	29.8				4.0E-02
I-132	2.136E+00	1.925E-01	0.7	1.362E+00	7.721E-02	0.5				3.0E+00
Cs-134	1.486E+00	4.030E-02	24.8	1.504E-01	1.769E-02	2.5				6.0E-02
Cs-136	2.132E-01	2.358E-02	0.7	2.350E-02	1.056E-02	0.1				3.0E-01
Cs-137	1.484E+00	4.204E-02	16.5	1.535E-01	1.626E-02	1.7				9.0E-02

各発電所等の環境モニタリング結果

単位：μSv/h

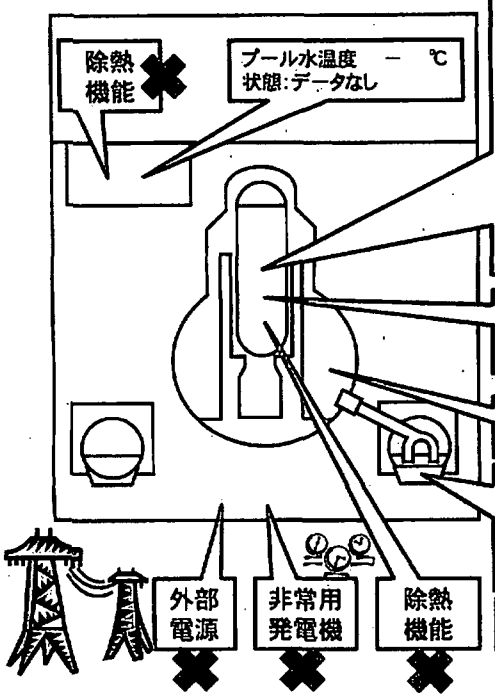
通常の平常値の範囲	会社名	発電所名	3月22日											
			12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
0.023～0.027	北海道電力㈱	泊発電所	0.025	0.026	0.026	0.025	0.025	0.025	0.027	0.026	0.027	0.026	0.027	0.026
0.024～0.060	東北電力㈱	女川原子力発電所	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.30	1.30	1.30	1.30
0.012～0.060		東通原子力発電所	0.018	0.017	0.017	0.017	0.018	0.017	0.018	0.017	0.018	0.018	0.016	0.018
0.033～0.050	東京電力㈱	福島第一原子力発電所※	256.3	255.6	254.6	254.1	274	330.8	265.5	367.9	254.1	246.1	239.3	235.9
0.036～0.052		福島第二原子力発電所	14.963	14.900	15.180	30.900	22.657	20.493	18.933	17.870	17.057	17.300	16.52	15.777
0.011～0.159		柏崎刈羽原子力発電所	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.067	0.067	0.069	0.069	0.072
0.036～0.053	日本原子力発電㈱	東海第二発電所	1.245	1.215	1.220	1.261	1.231	1.193	1.188	1.428	1.218	1.170	1.142	1.112
0.039～0.110		敦賀発電所	0.073	0.074	0.073	0.075	0.073	0.073	0.074	0.073	0.074	0.073	0.073	0.073
0.084～0.108	中部電力㈱	浜岡原子力発電所	0.094	0.095	0.092	0.091	0.088	0.086	0.086	0.086	0.086	0.086	0.087	0.086
0.0207～0.132	北陸電力㈱	志賀原子力発電所	0.033	0.032	0.032	0.032	0.042	0.037	0.045	0.037	0.037	0.035	0.036	0.035
0.028～0.130	中国電力㈱	島根原子力発電所	0.029	0.028	0.030	0.030	0.037	0.031	0.031	0.030	0.030	0.029	0.03	0.03
0.070～0.077	関西電力㈱	美浜発電所	0.071	0.072	0.072	0.073	0.073	0.072	0.072	0.072	0.072	0.071	0.076	0.075
0.045～0.047		高浜発電所	0.042	0.043	0.042	0.042	0.043	0.042	0.042	0.043	0.045	0.046	0.046	0.043
0.036～0.040		大飯発電所	0.034	0.034	0.035	0.034	0.034	0.034	0.035	0.034	0.035	0.036	0.038	0.036
0.011～0.080	四国電力㈱	伊方発電所	0.015	0.015	0.014	0.014	0.014	0.014	0.014	0.014	0.015	0.014	0.014	0.014
0.023～0.087	九州電力㈱	玄海原子力発電所	0.027	0.028	0.027	0.026	0.028	0.027	0.027	0.026	0.027	0.027	0.026	0.026
0.034～0.120		川内原子力発電所	0.038	0.037	0.039	0.036	0.038	0.036	0.039	0.038	0.038	0.036	0.039	0.037
0.009～0.069	日本原燃(株)	六ヶ所 再処理事業所	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
0.009～0.071		六ヶ所 埋設事業所	0.019	0.019	0.020	0.019	0.020	0.020	0.020	0.020	0.020	0.020	0.019	0.019

※福島第一原子力発電所については、作業状況により若干測定時間のずれ及び測定位置の変更が生じることもございます。

通常の平常値の範囲	会社名	発電所名	3月23日											
			0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
0.023～0.027	北海道電力㈱	泊発電所	0.029	0.027	0.025	0.026	0.025	0.034	0.029	0.027	0.027	0.029		
0.024～0.060	東北電力㈱	女川原子力発電所	1.30	1.30	1.30	1.30	1.30	1.20	1.20	1.20	1.20	1.20		
0.012～0.060		東通原子力発電所	0.017	0.017	0.018	0.018	0.018	0.018	0.018	0.019	0.019	0.018		
0.033～0.050	東京電力㈱	福島第一原子力発電所※	233.4	227.5	226.7	227.6	229.1	229.5	229.6	229.3	229.4	229.1		
0.036～0.052		福島第二原子力発電所	15.347	14.790	14.540	14.383	14.293	14.227	14.123	14.057	13.953	17.130		
0.011～0.159		柏崎刈羽原子力発電所	0.077	0.077	0.077	0.083	0.073	0.067	0.067	0.065	0.064	0.066		
0.036～0.053	日本原子力発電㈱	東海第二発電所	1.093	1.081	1.072	1.063	1.058	1.050	1.047	1.047	1.044	1.039		
0.039～0.110		敦賀発電所	0.073	0.073	0.075	0.074	0.073	0.073	0.075	0.072	0.073	0.073		
0.084～0.108	中部電力㈱	浜岡原子力発電所	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.086	0.086	0.086		
0.0207～0.132	北陸電力㈱	志賀原子力発電所	0.034	0.033	0.033	0.032	0.032	0.032	0.032	0.032	0.032	0.031		
0.028～0.130	中国電力㈱	島根原子力発電所	0.030	0.030	0.030	0.031	0.031	0.030	0.031	0.030	0.030	0.032		
0.070～0.077	関西電力㈱	美浜発電所	0.073	0.072	0.072	0.072	0.073	0.072	0.072	0.072	0.073	0.071		
0.045～0.047		高浜発電所	0.043	0.043	0.042	0.042	0.042	0.042	0.042	0.042	0.043	0.043		
0.036～0.040		大飯発電所	0.036	0.035	0.034	0.035	0.034	0.034	0.034	0.035	0.033	0.035		
0.011～0.080	四国電力㈱	伊方発電所	0.014	0.015	0.014	0.014	0.014	0.014	0.014	0.014	0.015	0.015		
0.023～0.087	九州電力㈱	玄海原子力発電所	0.027	0.027	0.025	0.026	0.027	0.026	0.026	0.026	0.026	0.027		
0.034～0.120		川内原子力発電所	0.038	0.035	0.038	0.036	0.038	0.037	0.037	0.036	0.037	0.037		
0.009～0.069	日本原燃(株)	六ヶ所 再処理事業所	0.016	0.016	0.016	0.017	0.016	0.016	0.016	0.017	0.017	0.017		
0.009～0.071		六ヶ所 埋設事業所	0.020	0.019	0.019	0.020	0.020	0.020	0.019	0.020	0.022	0.021		

※福島第一原子力発電所については、作業状況により若干測定時間のずれ及び測定位置の変更が生じることもございます。

福島第一原子力発電所1号機の状況
（3月23日　12:00現在）



原子炉圧力A　0．457MPa※
原子炉圧力B　0．420Mpa※
状態:上昇傾向
※:絶対圧に換算

原子炉水位A　－1750mm
原子炉水位B　－1750mm
状態:燃料頂部から上記水位が冠水していない。

原子炉水温度　－　℃
状態:データなし

原子炉圧力容器温度:
給水ノズル温度　345℃
圧力容器下部温度　350℃

原子炉格納容器圧力　0．320MPa
状態:大きな変動なし

S／P水温　－　℃
状態:データなし

S／P圧力　0．300MPa
状態:大きな変動なし

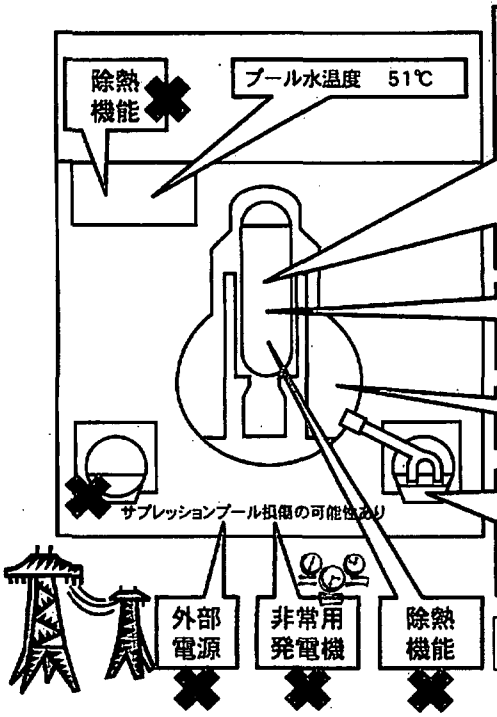
発生後の主要なできごと

11日14:46　運転中、地震により自動停止
11日15:42　10条通報(全交流電源喪失)
11日16:36　15条事象の発生
（非常用炉心冷却装置注水不能）
12日01:20　15条事象の発生
（格納容器圧力異常上昇）
12日14:30　ベント開始
12日15:36　爆発音
12日20:20　海水及びホウ酸の炉心注入開始
23日02:33　消火系に加え、給水系を使うことにより炉心への注水量を増量
（2m³/h → 18m³/h）

現状:海水の炉心注入を継続

原子力ハンドブック編集委員会,原子力ハンドブック

福島第一原子力発電所2号機の状況
（3月23日　12:00現在）



原子炉圧力A　0．078MPa※
原子炉圧力B　0．078Mpa※
状態:大きな変動なし
※:絶対圧に換算

原子炉水位A　－1300mm
状態:燃料頂部から上記水位が冠水していない。

原子炉水温度　－　℃
状態:データなし

原子炉圧力容器温度:
給水ノズル温度　105℃
圧力容器下部温度　105℃

原子炉格納容器圧力　0．11MPa
状態:大きな変動なし

S／P水温　－　℃
状態:データなし

S／P圧力　－　MPa
状態:ダウンスケール

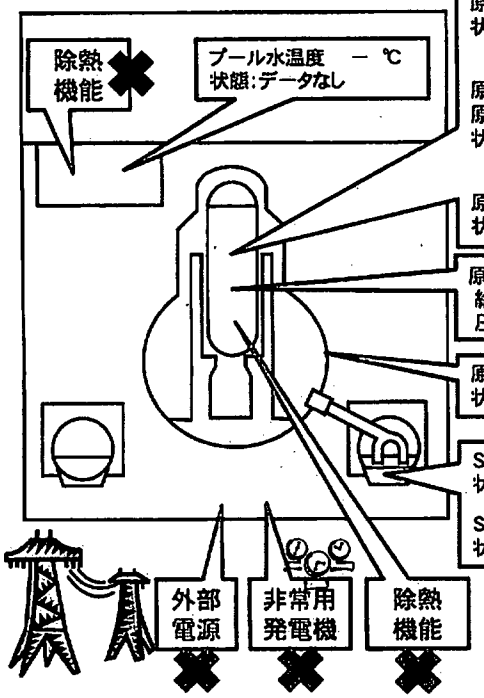
発生後の主要なできごと

11日14:46　運転中、地震により自動停止
11日15:42　10条通報(全交流電源喪失)
11日16:36　15条事象の発生
（非常用炉心冷却装置注水不能）
14日13:25　15条事象の発生
（原子炉冷却機能喪失）
14日22:50　15条事象の発生
（格納容器圧力異常上昇）
15日06:10　爆発音発生
15日06:20頃　サプレッションプール(圧力抑制室)損傷の可能性あり
20日15:05～17:20　燃料プール冷却浄化系(FPC)から使用済燃料プール(SFP)に約40tの海水を注水
20日15:46　パワーセンター受電
21日18:22　白煙が発生。22日7:11にほとんど見えない程度に減少
22日16:07　SFPに約18tの海水を注水

現状:海水の炉心注入を継続

原子力ハンドブック編集委員会,原子力ハンドブック

福島第一原子力発電所3号機の状況
（3月23日　12:00現在）



発生後の主要なできごと

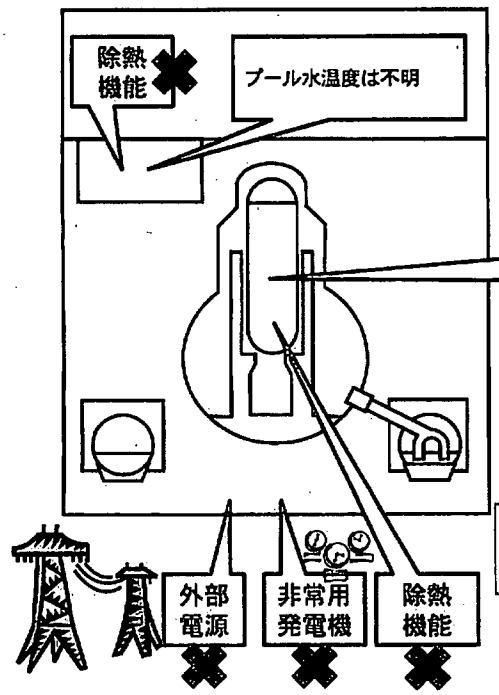
11日14:46　運転中、地震により自動停止
11日05:42　10条通報(全交流電源喪失)
13日05:10　15条事象の発生
（非常用炉心冷却装置注水不能）
13日09:20　ベント開始
14日07:44　15条事象の発生(格納容器圧力異常上昇)
11日11:01　爆発音
16日08:30頃　白煙が発生
17日09:48～10:01　自衛隊ヘリによる放水
（計4回)を実施
17日19:05～20:07　高圧放水車による散水
（警察1回、自衛隊5回）
18日14時前～14:38　自衛隊消防車6台による地上放水
～14:45　米軍消防車1台による地上放水
19日0:00～01:00　消防庁による放水
19日14:10～20日3:40　消防庁による放水
20日 11:00　格納容器内圧力が上昇(320kPa)。
その後、低下。
20日20:39～21日3:58　消防庁による放水
21日15:55頃　灰色がかった煙が発生。17:55に煙が収まっていることを確認
22日15:10～15:59　消防庁による放水
22日22:43　中央操作室の照明復帰

現状:プールへの放水作業及び海水の炉心注入

原子力ハンドブック編集委員会,原子力ハンドブック

福島第一原子力発電所4号機の状況
（3月23日　12:00現在）

定検停止中



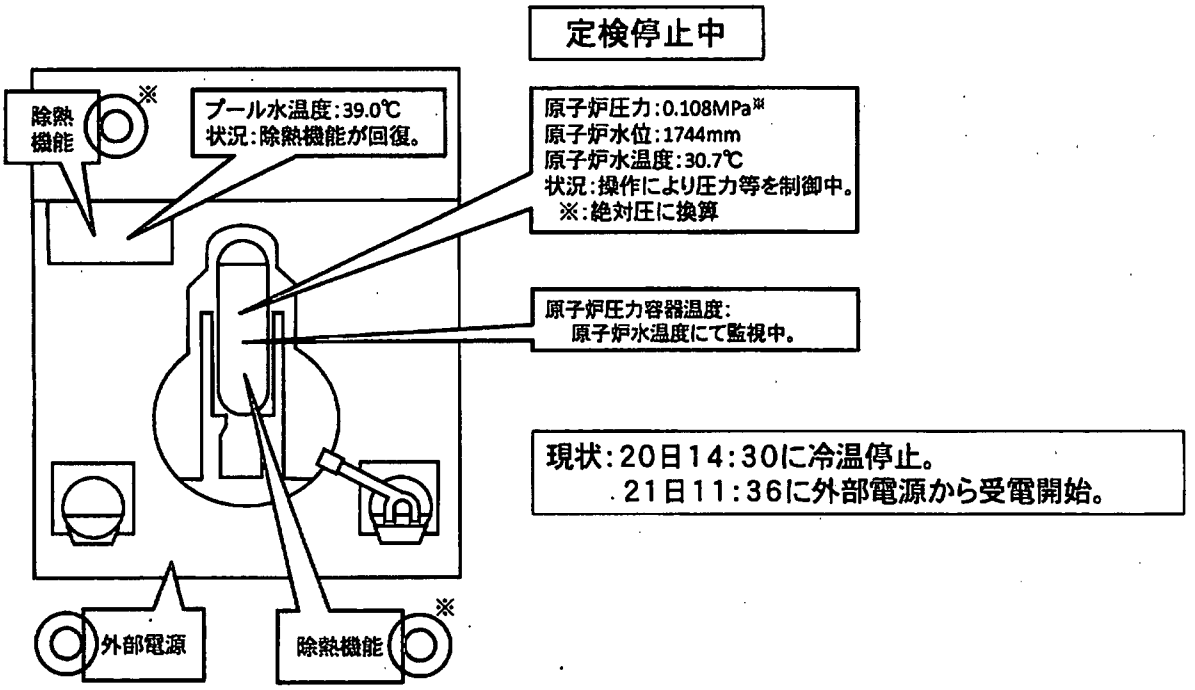
発生後の主要なできごと

地震発生時、定期検査により停止中
11日15:42　第10条通報(全交流電源喪失)
14日04:08　使用済燃料プール温度84℃
15日06:14　4Fの壁が一部破損の確認
15日09:38　3階部分で火災(12:25鎮火)
16日05:45　4号機で火災。事業者によると現場での火は確認できず(06:15)
20日09:43～　自衛隊による使用済燃料プール(SFP)への放水
20日18:30頃 ～ 19:46　自衛隊によるSFPへの放水
21日06:37～08:41　自衛隊によるSFPへの放水
21日15:00頃　パワーセンターまでのケーブル敷設完了
22日10:35　パワーセンター受電
22日17:17～20:32　コンクリートポンプ車による放水
23日10:00～　コンクリートポンプ車による放水

現状:原子炉圧力容器に燃料体が存在しない
プールには水が残っていると評価(東電)

原子力ハンドブック編集委員会,原子力ハンドブック

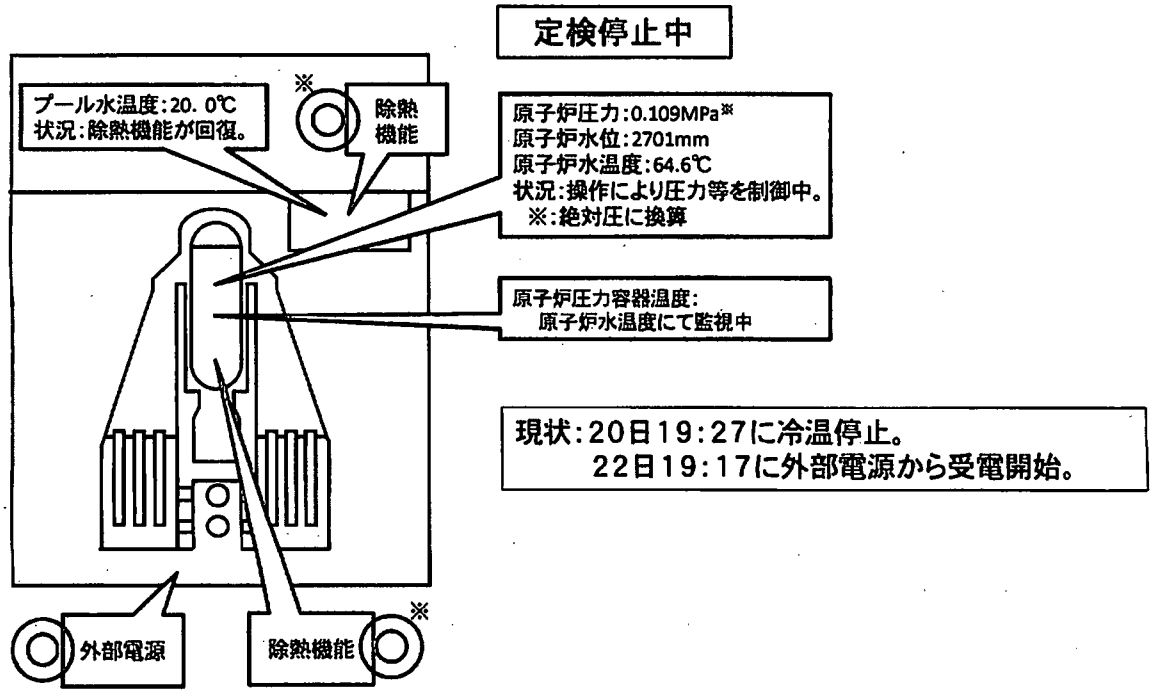
福島第一原子力発電所5号機の状況
（3月23日　12:00現在）



※ 炉水とプール水を切替えて除熱

原子力ハンドブック編集委員会,原子力ハンドブック

福島第一原子力発電所6号機の状況
（3月23日　12:00現在）



※ 炉水とプール水を切替えて除熱

原子力ハンドブック編集委員会,原子力ハンドブック

福島第一原子力発電所の状況

（平成２３年３月２３日、原子力保安検査官撮影）

写真１　中央制御室の中で機器の記録を記載する作業員

写真２　中央制御室内でパラメーター確認中の作業員

写真３　裏盤でパラメータ確認中作業員

写真４　セキュリティゲート

本件に関する問い合わせ先
原子力災害現地対策本部（広報班）
０２４－５２１－７８３７

福島第一原子力発電所　プラント関連パラメータ

3月23日　12:00現在

号機	1u	2u	3u	4u	5u	6u
注水状況	給水ラインを用いた海水注入中。 流量 2 m^3/hr (本設計器) (3/23 9:00)	消火系ラインを用いた海水注入中。 流量 12 m^3/hr (本設計器) (3/23 09:00)	消火系ラインを用いた海水注入中。 流量 ハンチング (本設計器) (3/23 09:10)	停止中	停止中	停止中
原子炉水位	燃料域A：−1750mm 燃料域B：−1750mm (3/23 12:00 現在)	燃料域A：−1300mm (3/23 09:00 現在)	燃料域A：−1800mm 燃料域B：−2300mm (3/23 09:10 現在)	−	停止域 1744mm (3/23 12:00 現在)	停止域 2701mm (3/23 12:00 現在)
原子炉圧力	0.356MPa g (A) 0.320MPa g (B) (3/23 12:00 現在)	−0.023MPa g (A) −0.023MPa g (B) (3/23 09:00 現在)	−0.104MPa g (C) 0.034MPa g (A) (3/23 09:10 現在)	−	0.007MPa g (3/23 12:00 現在)	0.008MPa g (3/23 12:00 現在)
原子炉水温度	−			−	30.7℃ (3/23 12:00 現在)	64.6℃ (3/23 12:00 現在)
原子炉圧力容器温度	給水ノズル温度：345℃ 圧力容器下部温度：350℃ (3/23 12:00 現在)	給水ノズル温度：105℃ 圧力容器下部温度：105℃ (3/23 09:00 現在)	給水ノズル温度：304.8℃ 圧力容器下部温度：225.5℃ (3/23 9:10 現在※)	4u:原子炉内に発熱体（燃料）なし 5,6u:原子炉水温度にて監視中		
D/W・S/C 圧力	D/W 0.320MPa abs S/C 0.300MPa abs (3/23 12:00 現在)	D/W 0.11MPa abs S/C ダウンスケール (3/23 09:00 現在)	D/W 0.100MPa abs S/C ダウンスケール (3/23 09:10 現在)	−		
CAMS	D/W 4.88×10^1Sv/h S/C 3.06×10^1Sv/h (3/23 09:00 現在)	D/W 5.14×10^1Sv/h S/C 1.76×10^0Sv/h (3/23 09:00 現在)	D/W 6.02×10^1Sv/h S/C 1.74×10^0Sv/h (3/23 09:10 現在)	−		
D/W 設計使用圧力	0.384MPa g	0.384MPa g	0.384MPa g	−		
D/W 最高使用圧力	0.427MPa g	0.427MPa g	0.427MPa g			
使用済燃料プール水温度	−	51℃ (3/23 04:20 現在)	−	84℃ (3/14 4:08)	39.0℃ (3/23 12:00 現在)	20.0℃ (3/23 12:00 現在)
電源	外部電源受電中 (P/C2C)		外部電源受電中 (P/C4D)		外部電源受電中	
その他情報						

平成２３年３月２３日
原子力安全・保安院

地震被害情報（第４５報）
（３月２３日１２時３０分現在）

原子力安全・保安院が現時点で把握している東京電力㈱福島第一原子力発電所、福島第二原子力発電所、東北電力㈱女川原子力発電所、日本原子力発電（株）東海第二、電気、ガス、熱供給、コンビナート被害の状況は、以下のとおりです。

前回からの変更点は以下のとおり。

１．原子力発電所関係

○福島第一原子力発電所

【注水・放水関係】

・４号機について、コンクリートポンプ車（50ｔ／ｈ）が放水開始（23日10:00）

２．産業保安関係

別紙参照

（別紙）

１　発電所の運転状況【自動停止号機数：１０基】

○東京電力(株)福島第一原子力発電所（福島県双葉郡大熊町及び双葉町）

（１）運転状況

１号機（46 万 kW）（自動停止）

２号機（78 万 4 千 kW）（自動停止）

３号機（78 万 4 千 kW）（自動停止）

４号機（78 万 4 千 kW）（定検により停止中）

５号機（78 万 4 千 kW）（定検により停止中、20 日 14:30 冷温停止）

６号機（110 万 kW）（定検により停止中、20 日 19:27 冷温停止）

（２）モニタリングの状況

別添参照

（３）主なプラントパラメーター（23 日 12:00 現在）

	１号機	２号機	３号機	４号機	５号機	６号機
原子炉圧力*1 [MPa]	0.457(A) 0.420(B)	0.078(A) 0.078(B)	-0.003(C) 0.135(A)	－	0.108	0.109
原子炉格納容器圧力（D/W）[kPa]	320	110	100	－	－	－
原子炉水位*2 [mm]	-1750(A) -1750 (B)	-1300(A) 不明（B）	-1800(A) -2300(B)	－	1744	2701
原子炉格納容器内 S/C 水温 [℃]	－	－	－	－	－	－
原子炉格納容器内 S/C 圧力 [kPa]	300	D/S	D/S	－	－	－
使用済燃料プール水温度 [℃]	－	51*4	－	不明*3	39.0	20.0
備　考	3/23 12:00 現在の値	3/23 09:00 現在の値	3/23 09:10 現在の値		3/23 12:00 現在の値	3/23 12:00 現在の値

＊１：絶対圧に換算

＊２：燃料頂部からの数値

＊３：3 月 14 日 4:08 現在、84℃

＊４：3 月 23 日 4:20 現在

（４）各プラントの状況

＜１号機関係＞

・原子力災害対策特別措置法第１５条（非常用炉心冷却装置注水不能）通報（11 日 16:36）
・１号機の原子炉圧力容器内に消火系ラインを用いて海水注入開始(12 日 20:20)→14 日 01:10 一時中断
・１号機で爆発音。（12 日 15:36）
・消火系に加え、給水系を使うことにより炉心への注水量を増量（2m^3／h →18m^3／h）（23 日 02:33）
・原子炉圧力容器へ海水注入中。（23 日 12:30 現在）

＜２号機関係＞

・原子力災害対策特別措置法第１５条（非常用炉心冷却装置注水不能）通報（11 日 16:36）
・３号機の建屋の爆発に伴い、原子炉建屋ブローアウトパネル開放（14 日 11 時過ぎ）
・原子炉圧力容器の水位が低下傾向（14 日 13:18）。原子力災害対策特別措置法第１５条事象（原子炉冷却機能喪失）である旨、受信（14 日 13:49）
・原子炉圧力容器内に消火系ラインを用いて海水注入準備(14 日 19:20)
・原子炉圧力容器の水位が低下傾向（14 日 22:50）
・２号機で爆発音するとともに、サプレッションプール（圧力抑制室）の圧力低下（15 日 6:10）。同室に異常が発生したおそれ（15 日 6:20 頃）
・外部送電線から予備電源変電設備までの受電を完了し、そこから負荷側へのケーブル敷設を実施（19 日 13:30 現在）
・使用済燃料プールに海水を４０ｔ注入（冷却系配管に消防車のポンプを接続）（20 日 15:05～17:20）
・２号機のパワーセンター受電（20 日 15:46）
・白煙が発生（21 日 18:22）
・白煙はほとんど見えない程度に減少（22 日 7:11 現在）
・使用済燃料プールに海水を 18 トン注入（22 日 16:07～17:01）
・原子炉圧力容器へ海水注入中（23 日 12:30 現在）

＜３号機関係＞

・３号機の原子炉圧力容器内に消火系ラインから真水注入開始（13 日 11:55）
・３号機の原子炉圧力容器内に消火系ラインから海水注入開始(13 日 13:12)
・３号機及び１号機の注入をくみ上げ箇所の海水が少なくなったため停止(14 日 1:10)

・３号機の海水注入を再開(14 日 3:20)
・３号機の格納容器圧力が異常上昇(14 日 7:44)。原子力災害対策特別措置法第１５条事象である旨、受信（14 日 7:52）
・３号機で１号機と同様に原子炉建屋付近で爆発（14 日 11:01）
・３号機から白い湯気のような煙が発生（16 日 8:30 頃）
・３号機の格納容器が破損しているおそれがあるため、中央制御室（共用）から作業員退避（16 日 10:45)。その後、作業員は中央制御室に復帰し、注水作業再開（16 日 11:30）
・自衛隊ヘリにより３号機への海水の投下を４回実施（17 日 9:48、9:52、9:58、10:01）
・警察庁機動隊が放水のため現場到着（17 日 16:10）
・自衛隊消防車により放水（17 日 19:35)。
・警察庁機動隊による放水（17 日 19:05～19:13）
・自衛隊消防車５台が放水（17 日 19:35、19:45、19:53、20:00、20:07）
・自衛隊消防車６台（６ｔ放水／台）が放水（18 日 14 時前～14:38）
・米軍消防車１台が放水（18 日 14:45 終了）
・東京消防庁ハイパーレスキュー１４台が正門前に到着し（18 日 23:10)、うち、６台が地上放水のため発電所に入構（18 日 23:30）
・東京消防庁ハイパーレスキュー隊が放水（20 日 3:40 終了）
・３号機の格納容器内圧力が上昇（20 日 11:00 現在 320kPa)。圧力下げるための準備を進めていたが、直ちに放出を必要とする状況ではないと判断し、圧力監視を継続（21 日 12:15 120 kPa）
・ケーブル引き込みの現地調査（20 日 11:00～16:00）
・東京消防庁ハイパーレスキュー隊が３号機の使用済燃料プールに放水（20 日 21:39～21 日 03:58）
・外部電源復旧工事中。
・灰色がかった煙が発生（21 日 15:55 頃）
・煙が収まっていることを確認（21 日 17:55）
・灰色がかった煙は白みがかった煙に変化し終息に向かっていると思われる（22 日 7:11 現在）
・東京消防庁及び大阪市消防局が放水（約 180t）（22 日 15:10～15:59）
・中央操作室の照明が復帰（22 日 22:43）
・原子炉圧力容器へ海水注入中（23 日 12:30 現在）

＜４号機関係＞
・原子炉圧力容器のシュラウド工事中のため、原子炉圧力容器内に燃料は

なし。
・４号機の使用済燃料プール水温度が上昇（3 月 14 日 4:08 時点 84℃）
・４号機のオペレーションエリアの壁が一部破損していることを確認（15 日 6:14）。
・４号機で火災発生。（15 日 9:38）事業者によると、自然に火が消えていることを確認（15 日 11:00 頃）
・４号機で火災が発生（16 日 5:45 頃）。事業者は現場での火災は確認できず（16 日 6:15 頃）。
・自衛隊が４号機の使用済燃料プールへ放水（20 日 9:43）
・ケーブル引き込みの現地調査（20 日 11:00～16:00）
・自衛隊が４号機の使用済燃料プールへ放水（20 日 18:30 頃～19:46）
・自衛隊消防車１３台が使用済燃料プールに放水（21 日 06:37～08:41）
・パワーセンターまでのケーブル敷設工事完了（21 日 15:00 頃）
・パワーセンター受電（22 日 10:35）
・コンクリートポンプ車（50ｔ／ｈ）が約 150ｔ放水（22 日 17:17～20:32）
・コンクリートポンプ車（50ｔ／ｈ）が放水開始（23 日 10:00）

＜５号機，６号機関係＞
・６号機の非常用ディーゼル発電機（D/G）１台目（B）は運転により電力供給。復水補給水系（MUWC）を用いて原子炉圧力容器及び使用済燃料プールへ注水。
・６号機の非常用ディーゼル発電機（D/G）２台目（Ａ）起動。（19 日 4:22）
・５号機の残留熱除去系（ＲＨＲ）ポンプ（Ｃ）（19 日 5:00）及び６号機の残留熱除去系（ＲＨＲ）ポンプ（Ｂ）（19 日 22:14）が起動し、除熱機能回復。使用済燃料プールを優先的に冷却（電源：6 号の非常用ディーゼル発電機）（19 日 5:00）
・５号機、冷温停止（20 日 14:30）
・６号機、冷温停止（20 日 19:27）
・５号機及び６号機、起動用変圧器まで受電（20 日 19:52）
・５号機、電源を非常用ディーゼル発電機から外部電源に切り替え（21 日 11:36）
・６号機、電源を非常用ディーゼル発電機から外部電源に切り替え（22 日 19:17）

＜使用済燃料共用プール＞
・１８日６：００過ぎ、プールはほぼ満水であることを確認

・１９日９：００時点でのプール水温度は５７℃程度
・共用プールに注水（21 日 10:37～15:30）
・２１日１６：３０時点でのプール水温度は６１℃程度

○東京電力(株)福島第二原子力発電所（福島県双葉郡楢葉町及び富岡町）

（１）運転状況

１号機（110 万 kW）（自動停止、14 日 17:00 冷温停止）
２号機（110 万 kW）（自動停止）14 日 18:00 冷温停止）
３号機（110 万 kW）（自動停止、12 日 12:15 冷温停止）
４号機（110 万 kW）（自動停止、15 日 7:15 冷温停止）

（２）モニタリングポスト等の指示値

別添参照

（３）主なプラントパラメーター（23 日 12:00 現在）

	単位	１号機	２号機	３号機	４号機
原子炉圧力*1	MPa	0.15	0.12	0.11	0.15
原子炉水温	℃	31.0	28.5	33.8	30.3
原子炉水位*2	mm	9146	10296	8394	8785
原子炉格納容器内 ｻﾌﾟﾚｯｼｮﾝﾌﾟｰﾙ水温	℃	25	24	26	25
原子炉格納容器内 ｻﾌﾟﾚｯｼｮﾝﾌﾟｰﾙ圧力	kPa (abs)	108	106	104	105
備　考		冷温停止中	冷温停止中	冷温停止中	冷温停止中

＊１：絶対圧に換算
＊２：燃料頂部からの数値

（４）その他異常等に関する報告

・１号機にて原子力災害対策特別措置法第１０条通報（11 日 18:08）
・１、２、４号機にて同法第１０条通報（11 日 18:33）
・１号機にて原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生（12 日 5:22）
・２号機にて原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生（12 日 5:32）
・４号機にて原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生（12 日 6:07）

○東北電力(株)女川原子力発電所（宮城県牡鹿郡女川町、石巻市）

（１）運転状況

１号機（52万4千kW）（自動停止、12日0:58冷温停止）

２号機（82万5千kW）（自動停止、地震時点で冷温停止）

３号機（82万5千kW）（自動停止、12日1:17冷温停止）

（２）モニタリングポスト等の指示値

MP２付近（敷地最北敷地境界）：

約6,500nGy/h(=6.5μSv/h)（14日19:00）→約1.4μSv/h（22日16:00）

（３）その他異常に関する報告

・タービン建屋地下1階の発煙は消火確認（11日22:55）

・原子力災害対策特別措置法第１０条通報（13日13:09）

２　産業保安

○電気（3月23日12:30現在）

・東北電力（3月23日10:00現在）

停電戸数：約２１万戸　（延べ停電戸数　約４８６万戸）

停電地域：青森県　三八の一部地域（約５百戸）

岩手県　一部地域（約３万９千戸）

宮城県　一部地域（約１３万５千戸）

福島県　一部地域（約３万８千戸）

・東京電力

停電は3月19日01:00までに復旧済（延べ停電戸数　約４０５万戸）

・北海道電力

停電は3月12日14:00までに復旧済　（延べ停電戸数　約３千戸）

・中部電力

停電は3月12日17:11に復旧済　（延べ停電戸数　約４百戸）

○一般ガス（3月23日12:30現在）

死亡事故：地震との関係も含め原因詳細調査中。

・盛岡ガス（盛岡市）死者1名、負傷者10名

14日08:00　デパートの地下での爆発

・東部ガス（いわき市）死者1名

12日11:30　一般住宅での漏えいガスに着火

北海道、山形県、秋田県においては、供給停止の報告はない。

各社の供給停止状況は以下の通り。

・仙台市営ガス　358,781戸供給停止

・塩釜ガス(塩釜市)12,382 戸供給停止
・福島ガス（福島市）60 戸供給停止
・東部ガス（土浦市）2,796 戸供給停止
（水戸市）40 戸供給停止
・釜石ガス（釜石市）7,000 戸供給停止
・常磐共同ガス（いわき市）12,018 戸供給停止
・京葉ガス（浦安市）4,634 戸供給停止
・東北ガス（白河市）125 戸供給停止
・常磐都市ガス（いわき市）362 戸供給停止
・気仙沼市営ガス（気仙沼市）2,800 戸供給停止
・石巻ガス（石巻市）14,771 戸供給停止

○簡易ガス（3 月 23 日 12:30 現在）
各社の供給停止状況は以下の通り。
・宮城ガス（塩竈市）651 戸供給停止
（仙台市）2,058 戸供給停止
（黒川郡富谷町）2,318 戸供給停止
・岩沼市農業協同組合（岩沼市）753 戸供給停止
・橋本産業（東松島市）80 戸供給停止
・富岡ガス協業組合（双葉郡富岡町）428 戸供給停止
・福陽ガス（須賀川市）81 戸供給停止
・釜石瓦斯（釜石市）1,357 戸供給停止
・仙台市ガス局（名取市）1,225 戸供給停止
（仙台市）559 戸供給停止
（岩沼市）342 戸供給停止
（黒川郡富谷町）1,855 戸供給停止
・仙台プロパン（登米市）93 戸供給停止
（亘理郡山元町）360 戸供給停止
（東松島市）150 戸供給停止
・仙南ガス（白石市）409 戸供給停止
（岩沼市）252 戸供給停止
（柴田郡柴田町）1,806 戸供給停止
・カメイ（亘理郡山元町）189 戸供給停止
（白河市）596 戸供給停止
（須賀川市）783 戸供給停止
（いわき市）126 戸供給停止
（宮古市）197 戸供給停止

（東松島市矢本町）243 戸供給停止
・岩手中部ガス（北上市）779 戸供給停止
・共同ガス（須賀川市）163 戸供給停止
・東北ガス（白河市）360 戸供給停止
・いわきガス（いわき市）594 戸供給停止
・相馬ガス（相馬市）143 戸供給停止
・相馬市ガス（相馬市）100 戸供給停止
・勝田ガス事業協同組合（ひたちなか市）647 戸供給停止
・倉島商事（福島市）248 戸供給停止
・若松ガス（福島市）1,061 戸供給停止
・アイソン（安達郡本宮町）489 戸供給停止
・トーホクガス（多賀城市）130 戸供給停止
・三重商会（大船渡市）81 戸供給停止
・名取岩沼農業協同組合（岩沼市）586 戸供給停止
・ガス＆ライフ（東松島市）859 戸供給停止
・仙台エルピーガス（仙台市）3,594 戸供給停止

○熱供給（3 月 23 日 12:30 現在）
・小名浜配湯（いわき市小名浜）供給停止

○ＬＰガス（3 月 23 日 12:30 現在）
死亡事故：地震との関係も含め原因詳細調査中
・福島県いわき市　死者１名
１３日午前中　共同住宅でガス爆発

○コンビナート（3 月 23 日 12:30 現在）
・コスモ石油千葉製油所（千葉県市原市）
ＬＰＧ貯槽の支柱が折れ、破損。ガス漏れ火災。
重傷者１名、軽傷５名。3 月 21 日午前鎮火。
・JX 日鉱日石エネルギー(株)仙台製油所（宮城県仙台市）
出荷設備エリアで爆発、火災が発生。3 月 15 日午後鎮火。

３　原子力安全・保安院等の対応

【3 月 11 日】
１４：４６　地震発生と同時に原子力安全・保安院に災害対策本部設置
１５：４２　福島第一原子力発電所にて原子力災害対策特別措置法第１０条通報

１６：３６　福島第一原子力発電所１、２号機にて事業者が同法第１５条事象（非常用炉心冷却装置注水不能）発生判断（16:45 通報）

１８：０８　福島第二原子力発電所１号機にて原子力災害対策特別措置法第１０条通報

１８：３３　福島第二原子力発電所１、２、４号機にて原子力災害対策特別措置法第１０条通報

１９：０３　緊急事態宣言（政府原子力災害対策本部及び同現地対策本部設置）

２０：５０　福島県対策本部は、福島第一原子力発電所１号機の半径２ｋｍの住人に避難指示を出した。（２ｋｍ以内の住人は 1,864 人）

２１：２３　内閣総理大臣より、福島県知事、大熊町長及び双葉町長に対し、東京電力(株)福島第一原子力発電所で発生した事故に関し、原子力災害対策特別措置法第１５条第３項の規定に基づく指示を出した。

・福島第一原子力発電所から半径３ｋｍ圏内の住民に対する避難指示。

・福島第一原子力発電所から半径１０ｋｍ圏内の住民に対する屋内退避指示。

２４：００　池田経済産業副大臣現地対策本部到着

【3 月 12 日】

５：２２　福島第二原子力発電所１号機にて事業者が原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生判断（6:27 通報）

５：３２　福島第二原子力発電所２号機にて事業者が原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生判断（6:27 通報）

５：４４　総理指示により福島第一原子力発電所の１０ｋｍ圏内に避難指示

６：０７　福島第二原子力発電所４号機にて原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生

６：５０　原子炉等規制法第６４条第３項の規定に基づき、福島第一原子力発電所第１号機及び第２号機に設置された原子炉格納容器内の圧力を抑制することを命じた。

７：４５　内閣総理大臣より、福島県知事、広野町長、楢葉町長、富岡町長及び大熊町長に対し、東京電力(株)福島第二原子力発電所で発生した事故に関し、原子力災害対策特別措置法第１５条第３項の規定に基づく指示を出した。

・福島第二原子力発電所から半径３ｋｍ圏内の住民に対する避難指示。

・福島第二原子力発電所から半径１０ｋｍ圏内の住民に対する屋内退避指示。

１７：００　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事

象（敷地境界放射線量異常上昇）である旨、受信

１７：３９　内閣総理大臣が福島第二原子力発電所の避難区域
・福島第二原子力発電所から半径１０ｋｍ圏内の住民に対する避難を指示。

１８：２５　内閣総理大臣が福島第一原子力発電所の避難区域
・福島第一原子力発電所から半径２０ｋｍ圏内の住民に対する避難を指示。

１９：５５　福島第一原子力発電所１号機の海水注入について総理指示

２０：０５　総理指示を踏まえ、原子炉等規制法第６４条第３項の規定に基づき、福島第一原子力発電所第１号機の海水注入等を命じた。

２０：２０　福島第一原子力発電所１号機の海水注入を開始

【3月13日】

５：３８　福島第一原子力発電所３号機にて原子力災害対策特別措置法第１５条事象（全注水機能喪失）である旨、受信。
当該サイトについて、東京電力において現在、電源及び注水機能の回復と、ベントのための作業を実施中。

９：０１　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

９：０８　福島第一原子力発電所３号機の圧力抑制及び真水注入を開始

９：２０　福島第一原子力発電所３号機の耐圧ベント弁開放

９：３０　福島県知事、大熊町長、双葉町長、富岡町長、浪江町長に対し、原子力災害対策特別措置法に基づき、放射能除染スクリーニングの内容について指示

９：３８　福島第一原子力発電所１号機にて原子力災害対策特別措置法第１５条通報

１３：０９　女川原子力発電所にて原子力災害対策特別措置法第１０条通報

１３：１２　福島第一原子力発電所３号機の注入を真水から海水に切り替え

１４：３６　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

【3月14日】

１：１０　福島第一原子力発電所１号機及び３号機の注入をくみ上げ箇所の海水が少なくなったため停止。

３：２０　福島第一原子力発電所３号機の海水注入を再開

４：４０　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

５：３８　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

７：５２　福島第一原子力発電所３号機にて原子力災害対策特別措置法第１５条事象（格納容器圧力異常上昇）である旨、受信。

１３：２５　福島第一原子力発電所２号機にて原子力災害対策特別措置法第１５条事象（原子炉冷却機能喪失）である旨、受信。

２２：１３　福島第二原子力発電所にて原子力災害対策特別措置法第１０条通報

２２：３５　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

【3月15日】

０：００　国際原子力（ＩＡＥＡ）専門家派遣の受け入れを決定

ＩＡＥＡ天野事務局長による原子力発電所の被害に関する専門家派遣の意向を受け、原子力安全・保安院はＩＡＥＡによる知見ある専門家の派遣を受け入れることとした。なお、実際の受け入れ日程等については、今後調整を行う。

０：００　米国原子力規制委員会（ＮＲＣ）専門家派遣の受け入れを決定

７：２１　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

７：２４　（独）日本原子力研究開発機構東海研究開発センター核燃料サイクル工学研究所にて原子力災害対策特別措置法第１０条通報

７：４４　（独）日本原子力研究開発機構原子力科学研究所にて原子力災害対策特別措置法第１０条通報

８：５４　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

１０：３０　経済産業大臣が原子炉等規制法に基づき、４号機の消火及び再臨界の防止、２号機の原子炉内への早期注水及びドライウェルのベントの実施について指示

１０：５９　今後の事態の長期化を考慮し、現地対策本部の機能を福島県庁内へ移転することを決定。

１１：００　内閣総理大臣が福島第一原子力発電所の避難区域・炉内の状況を考慮して、新たに福島第一原子力発電所から半径２０ｋｍ圏～３０ｋｍ圏内の住民に対する屋内退避を指示

１６：３０　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

２２：００　経済産業大臣が原子炉等規制法に基づき、４号機の使用済燃料プールへの注水の実施を指示

２３：４６　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

【3月18日】

１３：００　文部科学省にて、福島第一、第二原子力発電所の緊急時における全国的モニタリング調査の強化を決定

１５：５５　原子炉等規制法第６２条の３に基づき、東京電力(株)福島第一原子力発電所第１・２・３・４号機における事故故障等（原子炉建屋内の放射性物質の非管理区域への漏えい）の報告を受理

１６：４８　原子炉等規制法第６２条の３に基づき、日本原子力発電(株)東海第二発電所における事故故障等(非常用ディーゼル発電機２Ｃ海水ポンプ用電動機の故障）の報告を受理

【3月19日】

７：４４　６号機の非常用ディーゼル発電機２台目（Ａ）起動
５号機の残留熱除去系（ＲＨＲ）ポンプ（Ｃ）が起動し、使用済燃料プールの冷却を開始(電源：６号機の非常用ディーゼル発電機))の旨を受信

８：５８　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

【3月20日】

２３：３０　原子力災害対策現地本部から、放射能除染スクリーニングレベルの基準を以下のとおり変更する旨、県知事及び関係市町村長（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯舘村）宛に指示

【3月21日】

７：４５　原子力災害対策現地本部から「安定ヨウ素剤の服用について」として、安定ヨウ素剤の服用は、本部の指示を受け、医療関係者の立ち会いのもとで服用するものであり、個人の判断で服用しない旨の指示を、県知事及び関係市町村長（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯舘村）宛に発出

１６：４５　原子力災害対策現地本部長から「屋内退避圏内での暖房器具の使用に係る喚気について」として、一酸化炭素中毒等の防止の観点及び被ばく低減の観点から、屋内において喚気を必要とする暖房器具を使用する場合の対応について屋内退避圏内の住民に周知する旨の指示を福島県知事及び市町村長(いわき市、田村市、南相馬市、広野町、川内村、浪江町、葛尾村、飯舘村）宛に発出。

１７：５０　原子力災害対策本部長から、ホウレンソウ及びカキナ、原乳に

ついて当分の間、出荷を控えるよう、関係事業者等に要請することの指示を福島県、茨城県、栃木県及び群馬県の各知事宛に発出。

【3月22日】

１６：００　原子力安全委員会緊急技術助言組織から、3月22日付け東京電力の「海水分析結果について」に関する原子力安全・保安院からの助言依頼について、回答（助言）を受理。

＜被ばくの可能性（3月23日12:30現在）＞

１．住民の被ばく

（１）二本松市福島県男女共生センターにおいて、双葉厚生病院からの避難者約60名を含む133名の測定を行い、13,000cpm以上の23名に除染を実施した。

（２）この他、福島県が用意した民間バスで、双葉厚生病院から川俣町済生会川俣病院へ移動した35名については、県対策本部は被ばくしていないと判断。

（３）バスにより避難した双葉町の住民約100名について、100名のうち、9名について測定した結果、以下の通りだった。県外(宮城県)に分かれて避難したが、その後合流して二本松市福島男女共生センターへ移動。

カウント数	人数
18,000cpm	１名
30,000～36,000cpm	１名
40,000cpm	１名
40,000cpm 弱※	１名
ごく小さい値	５名

※（１回目の測定では100,000cpmを超え、その後靴を脱いで測定した結果計測されたもの）

（４）３月１２日から３月１５日にかけて、大熊町のオフサイトセンターにおいて、スクリーニングを開始。現在までに162名が検査済み。初め除染の基準値を6,000cpmとし、110名が6,000cpm未満、41名が6,000cpm異常の値を示した。後に基準値を13,000cpmと引き上げた際には、８名が13,000cpm未満、３名が13,000cpm以上の値を示した。

検査を受けた162名のうち、５名が除染処置を施した後、病院へ搬送された。

（５）福島県において、避難した１０ｋｍ圏内の入院患者と病院関係者の避難を実施。関係者のスクリーニングを行った結果、3名について除染後も高い数値が検出されたため、第２次被ばく医療機関へ搬送。この搬送に

関係した消防職員 60 名のスクリーニングで 3 名について、バックグランドの２倍以上程度の放射線が検出されたため、60 名に対し除染を行った。

２．従業員等の被ばく

（１）福島第一原発で作業していた従業員１８名。測定の結果、1 名は 106.3mSv、その他の方は健康に影響ないレベルであるが具体的な数値は不明。106.3mSv の１名は、内部被ばくの恐れはなく医療的処置は不要とのこと。

（２）福島第一原発３号機の爆発の際に近くで作業していて負傷した従業員 7 名（意識あり）負傷。そのうち 6 名については福島第二の産業医で除染処置を施し、問題ないことを確認。1 名については病院で除染し、治療を終了。

３．その他

（１）福島県は３月１３日からスクリーニングを開始。避難所を巡回、保健所等１２ヶ所（常設）で実施中。実施結果は集計中。

（２）福島第一原発で給水作業に従事していた自衛隊員 5 名が被ばく。作業終了後（１２日）、ＯＦＣへ移動後の測定では 30,000cpm。除染後の測定では、5,000～10,000cpm。1 名は放医研に搬送。防衛省において、その他自衛官の被ばくは確認されず。

（３）警察官について、警察庁において 2 名の除染の実施を確認。異常の報告はなし。

＜放射能除染スクリーニングレベルに関する指示＞

（１）３月２０日、原子力災害対策現地本部から、放射能除染スクリーニングレベルの基準を以下のとおり変更する旨、県知事及び関係市町村長（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯舘村）宛に指示。

旧：γ線サーベイメーターにより 40 ベクレル/c ㎡または 6,000cpm

新：1 マイクロシーベルト／時（10cm 離れた場所での線量率）またはこれに相当する 100,000cpm

＜避難時における安定ヨウ素剤投与の指示＞

（１）３月１６日、原子力災害対策現地本部から、「避難区域（半径２０ｋｍ）からの避難時における安定ヨウ素剤投与の指示」を県知事及び市町村（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯舘村）宛に発出。

（２）３月２１日、原子力災害対策現地本部から「安定ヨウ素剤の服用について」として、安定ヨウ素剤の服用は、本部の指示を受け、医療関係者の立ち会いのもとで服用するものであり、個人の判断で服用しない旨の指示を、県知事及び関係市町村長（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯舘村）宛に発出。

＜負傷者の状況（3 月 23 日 12:30 現在）＞

１．地震による被害

・社員２名（軽傷）
・協力会社２名（うち１名両足骨折）
・行方不明２名（社員。４号タービン建屋内）
・急病人１名発生（脳梗塞、救急車搬送、県情報）
・管理区域外にて社員１名が左胸の痛みを訴えて救急車を要請（意識あり）
・社員２名が中央制御室での全面マスク着用中に不調を訴え、福島第二の産業医の受診を受けるべく搬送２．福島第一原子力発電所１号機爆発による被害

２．福島第一原子力発電所１号機の爆発による負傷

・１号機付近で爆発と発煙が発生した際に４名が１号タービン建屋付近（管理区域外）で負傷。川内診療所で診療。

３．福島第一原子力発電所３号機の爆発による負傷

・社員４名
・協力会社３名
・自衛隊４名（うち１名は内部被ばくの可能性を考慮し、「（独）放射線医学総合研究所」へ搬送。診察の結果内部被ばくはなし。３月１６日退院）

４．その他の被害

・福島第二原子力発電所内の診療所に変電所から腹痛を訴える人が来たが、被ばくをしていないことからいわき市の診療所へ搬送。

＜住民避難の状況（3 月 23 日 12:30 現在）＞

３月１５日 11:00、内閣総理大臣の指示により、福島第一原子力発電所半径２０ｋｍから３０ｋｍ圏内の住民に対して、屋内退避を指示。その旨を福島県及

び関係自治体へ連絡。

福島第一原子力発電所２０ｋｍ圏外及び福島第二原子力発電所１０ｋｍ圏外への避難は、措置済。

・福島第一原子力発電所２０ｋｍから３０ｋｍ圏内の屋内退避について、徹底中。
・福島県と連携して、屋内退避圏内の住民の生活支援等を実施。

＜飲食物への指示＞

３月２１日、原子力災害対策本部長から、下記の①、②について当分の間、出荷を控えるよう、関係事業者等に要請することの指示を福島県、茨城県、栃木県及び群馬県の各知事宛に発出。

①福島県、茨城県、栃木県及び群馬県において産出されたホウレンソウ及びカキナ
②福島県において産出された原乳

＜屋内退避圏内での暖房器具の使用に係る換気についての指示＞

３月２１日、原子力災害対策現地本部長から「屋内退避圏内での暖房器具の使用に係る換気について」として、一酸化炭素中毒等の防止の観点及び被ばく低減の観点から、屋内において換気を必要とする暖房器具を使用する場合の対応について屋内退避圏内の住民に周知する旨の指示を福島県知事及び市町村長（いわき市、田村市、南相馬市、広野町、川内村、浪江町、葛尾村、飯館村）宛に発出。

（本発表資料のお問い合わせ）
原子力安全・保安院
原子力安全広報課：吉澤、金城
電話：０３－３５０１－１５０５
０３－３５０１－５８９０

（参考）

【東北地方太平洋沖地震】

1．災害概要

（1）発生日時：平成23年3月11日（金）　１４：４６発生

（2）発生場所：震源三陸沖（北緯38度、東経142.9度）
深さ10km、マグニチュード9.0

（3）各地の震度

○震度４以上の地域

震度７　宮城県北部

震度６強　茨城県北部、茨城県南部

震度５強　青森県三八上北

震度５弱　新潟県中越

震度４

○震度４以上の市町村

震度６強　福島県楢葉町、富岡町、大熊町、双葉町

震度６弱　宮城県石巻市、女川町（発電所の震度計による）、東海村

震度５弱　新潟県刈羽村

震度４　青森県六ケ所村、東通村、新潟県柏崎市、神奈川県横須賀市

震度１　北海道泊村

Landau, Mindy

From: Landau, Mindy
Sent: Thursday, March 24, 2011 9:29 AM
To: DAbate, David
Subject: RE: Still interested in Japan?

OK, thanks

From: DAbate, David
Sent: Thursday, March 24, 2011 8:48 AM
To: Landau, Mindy
Subject: RE: Still interested in Japan?

I would be interested in supporting the ongoing NRC operations in Japan.

Nuclear Skills:
Completed Navy Nuclear Propulsion Training (Qualified on S1C Prototype)
5 Years – Reactor Operator/Technician – US Navy S6G plant (submarine – Pressurized Water)
4 Years – Portsmouth Naval Shipyard (Code 246 Test Engineering – Non Nuclear Systems)

International Skills:
2 Years – Lived/Worked in Japan – cultural understanding
Worked for Japanese company for a total of 8 years developing key relationships with Japanese personnel.

Business Background:
Extremely strong business and analysis background – MBA
Commercial activities – Japanese semi-conductor equipment company (technical and financial responsibilities)
Navy Civilian – provided extensive cost analysis for systems and programs
NRC – NRO financial cost analysis and contracting

NRC
With the NRC since January 2008

From: Landau, Mindy
Sent: Thursday, March 24, 2011 8:23 AM
To: DAbate, David
Subject: Still interested in Japan?

David,

The agency is soliciting interested personnel for the second wave of participants to replace the first wave beginning April 1 for about two weeks. If you are still interested, send me a brief summary of your qualifications/interest and I will forward your name to NSIR... thanks!

Mindy

Mindy S. Landau
Deputy Assistant for Operations

PPPP/87

Communication and Performance Improvement
Office of the Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
301-415-8703
mindy.landau@nrc.gov

Michael Scott

Interagency Phone # 8010 202-647-1512

3/25/11

Plant conditions - largely unchanged, injecting water into Unit 1

Fresh water barge accepted

All-Hands 2pm

Possible town hall mtg 2pm Saturday

NISA/TEPCO mtg 11 am.
As temp ↓, H_2 and O_2 could lead to H_2 explosion. Could you give us ideas to prevent explosion? Should we inert

---

3/25/11
Cabinet Meeting

New plans:
(1) Shielding to reduce plume
Launch project team -
want ~~U/S~~ participants
NISA will coordinate
(2) Movement of spent fuel
NISA will coordinate
~~(3)~~ U.S. expertise indispensible

pppp188

(3) Remote Project. Unmanned System (Control)
for hazardous areas. Need U.S.
robots and participation.

"We don't have the luxury of time."

3/26/11

Rec from > to allow f/k to return to exclusion area.

Equip Bh Ch Onahama tomorrow.

Contact RSO prior to going within 50-mile zone & when coming back out.

Warning - spiked drinks at Roppongi Bloody Bills

5:50 buses leave for Zumwalt's house

NISA / TEPCO mtg

More or less consistent with what is going on at site, so do not feel confidence.

U1 more serious than others?

Confirmed yesterday
U2 SFP skimmer surge tank in overflow
U4 helicopter - believe there is level.

Some of U1 water may have been blown off.

For U3, dose readings has led TEPCO to conclude fuel is not exposed

Not yet able to assess structural conditions of SFP walls

Considering venting with nitrogen. Have instrumentation to measure H_2 conc. But need power and how to measure H_2 in presence of moisture.

Believe steam suppressing H_2.

U1 Hydrogen 1.2kg/hr, from radiolysis
U3 1.7kg/hr, from radiolysis

TEPCO: Cannot state categorically that all 3 vessels are intact.

Need 2800 tons
Dam ~2400 tons.
Barge makes up ~~addition~~ remainder.
Taking next steps

Shielding 2pm 5th floor NISA
Room 526

Fuel movement 4pm Same room

Fuel Movement meeting

Estimate 10 yrs to start decommissioning

⇒ Action for us to find whatever research results are available regarding spent fuel processing and shipment

⇒ Involve industry / INPO

Need to put in place a good risk-management process. Will take a very long time to resolve this problem

3 issues:
- Confirm current condition of fuel
- evaluate shipping methods ~~from~~
- how to remove fuel from SFPs

8 pm Mtg

Japanese: Cooling has highest priority
But still emit radioactive matls

So have some urgency for shielding as for cooling. See from tomorrow. Want urgent action on this, including engineers from private sector.

For spent fuel project, (see 3 issues previous page) Need urgent action to address issues. NRC emphasized need to know structural strength of SFPs.

2 additional requests:

1. High-pressure hose with couplers.

2- Shielding technology, very effective clothing.

3/27/11

Maintain minimum debris retention rate until purged.

JS PMT working on re-entry guidance for U.S. citizens. Have to go ready for 10 am with PMT.

Fq 2:30 pm mtg with NISA on long-term monitoring plans.

~~Plans~~

11 am NISA/TEPCO

3/29 Switch all SFPs to fresh water cooling.

ive No current criticality concern for SFPs.

Will check on whether have Boraflex racks.

Barge available at earliest 3/31/11.

Nei says Move to involve PNL.

Nei says raise the source issue at 8:00 meeting

Still study-ing ability to hook up CAMS to measure H2.

2/4 pm mtgs will be in Room 1042 from Tuesday on.

8 pm Mtg per Japanese

3/15 U2 - not possible to add water for several hours
U1 U3 - Same situation but not as long

5 below 3 hrs no injection for U2. Must admit serious damage occurred to fuel

NRC: We believe fuel damage & potential containment breach in U2
Lesser (but some) fuel damage in U1 and U-3, with potential cont. breach in U-3 as well

□ Unit
□ Nitrog
□ We
□ Has
Cont
→
Cowlo
Start
Ear

23, 24, 25, 26, 27, 28, 29, 30, 31, 1, 2, 3, 4, 5, 6 = 14.5

3/28/11

042

Swedish embassy recommending KI to their folks.

1100 Mtg

- Unit 1 - Does TEPCO have any additional information on why reactor pressure on unit 1 is increasing.
- Nitrogen inerting - Would TEPCO like support (from industry) to help develop vent and purge of the Drywell & Suppression pool. Also has TEPCO considered use of the Post Accident Sampling System? (if TEPCO has a PASS)
- We would like to see the helicopter video that was obtained yesterday
- Has TEPCO identified the areas on unit 2, 3 where there may be containment leakage & how this may effect inerting and flooding.
  → approximate volume 2@3.

U2

Ideas for injecting N_2.

2 methods:

- Use equip for supplying N_2. Compressor through membrane 98% nitrogen. 42 m^3/hr. Could start earlier → FCVS
- Use liquid N_2. 300 m^3/hr

Supply line would attach to normally used line.

To inject, need to vent.

For U1, CV 3000 m^3. ⇒ Several days to replace

Plan to watch pressure as N_2 replaces

steam + decide whether to vent.
Timeframe - 1st method 3/30 be connected
2nd method later.

(1) Recs are consensus of deliberations by the most knowledgable organizations in U.S.
(2) Apply to what we would do
Are actions to be taken are clearly province of TEPCO and Japanese Reg. authorities
(3) Are subject to change as conditions change
(4) Are based on information available to us, which is of course incomplete
(5) Addresses concerns regarding N2

1625 yesterday 5800 mm
today 5850 mm

Elevation of weir plate 11 m from pool bottom.

Press ↑ in wl due to ↓ Flow as decay heat rate ↓

Examples of success: Changed from SW to FW.

Project Mtg - Sampling for SFP -
equip to be delivered on early
April.

3/29/11

U.S. industry will be assessing U1/2/3 cont ~~vessel~~ integrity ~~wet~~ and vessel integrity, would change recommendations for flooding and flow rates > Should have product (draft) in 18 hours. No change likely for U1.

Industry looking at N_2 inertion path that does not require valve manipulation in Rx bldg

Stress corrosion cracking of vessel, as potential issue. RST to send documents to us to look at, and will also ask industry to look into it.

U-COMM Priorities:
- Inerting
- Condition of U2/U3 containments / flooding / trade-offs
- Establishing levels in SFPs

Have found Cw-238, -239, -240 on site
Levels ~ consistent with ambient levels from fallout, but Radioisotope concentration suggests some may be from reactors

pump U1 SFP

Large concrete trucks will begin pumping 4/1.

will test U2 SFP today

will test U3 SFP today.

trans For U4, switched to FW ~~5/6~~ 5/28. No plans today.

how to have

Ne: Want to discuss dialogue going forward

Comments on rec. document:
(TEPCO)

On H_2O injection to core: Quantity injected is important. Need to monitor leakage into turbine bldg and not reduce Pstm in press vessels. Have tried to arrive at optimum quantity.

Page 3 A. b. Cons. do ready alternate ways to use cont. spray.

⇒ Q: What is issue with vacuum breakers?

After doing survey, would install equipment for nitrogen purge.

ent Trying to recover CAMS ability to measure H_2. Also, dehumidifying sample gas capability not there. Located in 4th

floor of Rx bldg, so access very difficult.

CAMs may have submerg

On levels inside SFPs: Being discussed at project Mgmtgs today.

U1: RPV: At 1630 on 3/12, RPV press reached 0.8 MPa. Indicates potential damage.
Cont: Likely intact since press rise.
Core: On 3/15 at 1200, CAMs 90 Sv/hr, so core likely damaged.
SFP: No evidence indicating fuel damage.

U2: RPV: At ~atm press, temp around 100°C. No direct data indicating impaired.
However, on 3/14 at 2300, press up to 0.75 MPa, thus possibility of damage.
Level below CAMS sensor.
Cont: At 0610 on 3/15, abnormal sound in S/C, and pressure gauge for S/C nonfunctional. Drywell press at atmospheric, so high likelihood of damage.
Core: At 3/18, CAMs at 110 Sv/h ⇒ high probability of damage. ~~based on MAR~~
SFP: MAR images temp 67°C.

U3: RPV: At 3/13 at 1300, press up to 0.9 MPa. Until 3/20, temp at

fdwt nozzle and RPV at 300°C and 350°C, indicating high likelihood of damage.

CAMs may have submerged Cont: At 3/23, temp ~~400°C~~ of PCV at 400°C. Gasket may be damaged. Also drywell pass ~ atmospheric. So likely damaged.

Core: On 3/24, CAMS 100 Sv/hr, indicating damage.

SFP: MoDis data for estimating temp, water surface confirmed, ~~not~~ no direct data indicating fuel damage

low temp

U4 SFP MoD image ⇒ No direct data indicating fuel damage. Need to more precisely determine what is going on pool

U5/U6 Coolant function working/stable

Not been able to confirm leak path from containment to turbine bldg.

---

400 mtg

⇒ Q: Can we provide an expert on TMI fuel removal to participate in that project team.

Next mtg 3/31.

3/30/11

Port Damaschke: john.damaschke@dhs.gov
703-621-7715

11:00 Mtg:
2 x Navy uniform
1 x NR
1 Int
1 OIP
1 DOE
5 x NRC

~~Plan to start water spray for~~

TEPCO will check on how H_2O will be added to #1 SFP
U2 injected 15-20 m^3, Suspended for today's switching to fire trucks
U3 yesterday injected 100 m^3 fresh water spray
U4 Start water spray 3/31. This afternoon from present pumper.

U4 lights in CR on yesterday ⇒ all lights now on.

Progress on nitrogen injection. Hard to work in high rad waste. Planning to remove high dose trash today. Probably on 4/1 or 4/2. ~~3~~ ADV in Rx Bldg.
⇒ NRC requested CAMS elevations for all 3 units
ADV in Rx Bldg will know about air supply
Yardstick for U2/U3 would be time

Interim target - instead of steam would inject nitrogen.

⇒ Elevation of equipment relative to drywell

H_2O in basement	1	220K gal
	2	327K gal
	3	445K gal
	4	1.4M gals

3/31/11

⇒ For 1100. Radioactivities in TS H_2O - From core vs. SFP?

⇒ Analysis of hole size for U2 - DOE?

Regarding N_2 purge, have verified electrical connections, definitely for U1 planning to pressurize, and start injecting 1 April, with range of 3 days after that date ⇒ start injecting April 4

CAMS - Working to restore sampling capability. Regarding U2, can use temp. cables to get to CAMS pumps. Megger'ing - zero for Unit 2. Regarding U1 and U3, laying cables going forward. But requires running cables in underground of turbine bldg. Cannot lay cables until water removed.

PASS system installed. All reactors have same specification equipment onboard for time being, no effort to rehabilitate

New understanding of U-1. On Hydrogen risk, planning activities on assumption that H_2 in gas

Phase not explosive, due to steam.
Recognize that risks are higher going forward, as steam could condense.

NRC says that will consider our recommendations, and prime minister will check plant parameters and report back. Will also check on MSRIR and report back. Understand vessel intact.

TEPCO: Very concerned about large volume of cont. water, which could affect injection to reactor itself. That is most urgent task. While working that, we will be monitoring reactor conditions.

For 4 pm call:

1. Criticality
2. SW Corrosion/cracking
3. SFP fuel integrity

From: Giitter, Joseph
Sent: Friday, March 25, 2011 9:49 PM
To: ET05 Hoc; McGinty, Tim
Subject: March 25 1500 EDT one pager (3).doc
Attachments: March 25 1500 EDT one pager (3).doc

PPPP/89

Mitchell, Mark

From: Mitchell, Mark
Sent: Friday, March 25, 2011 10:46 AM
To: Smith, Desiree
Subject: FW: NRC Region III data request

This is the centralized plan from Exelon and we will be compiling similar results from all plants that report it, as it comes in.

Mark

From: ronald.chrzanowski@exeloncorp.com [mailto:ronald.chrzanowski@exeloncorp.com]
Sent: Thursday, March 24, 2011 2:53 PM
To: Mitchell, Mark
Cc: Darin.Benyak@exeloncorp.com; Dominic.Imburgia@exeloncorp.com; Ronald.Gaston@exeloncorp.com; peter.orphanos@exeloncorp.com; james.meister@exeloncorp.com; Francis.Leone@exeloncorp.com
Subject: NRC Region III data request

Mark

Thanks for your call today to allow for me to coordinate all information requests from NRC Region III to my office for the Japanese fallout data.

Below I have summarized the information you are looking to receive from me.

Establishing the Background:

Last REMP sample data for Drinking water
Last REMP sample data for surface water
Last REMP data for milk

Air particulate cartridge, count for gamma from week of 3/14, when available
Charcoal cartridge, count for gamma from week of 3/14, when available

This week Exelon has decided to perform the following sampling and analysis for gammas.

Rainwater "bucket" sample in upwind sector, when sufficient rain water is collected to count (approx. 1 liter)
Control location Milk samples on a growing season frequency
Control location Air particulate cartridge gamma analysis
Control location Charcoal cartridge gamma analysis

The above information will be emailed to you from me weekly starting Monday March 28th, with the available base line data to start, and all new data collected since the event until we agree that it is no longer required. The air particulate and charcoal cartridge gamma analysis will be sent as soon as it can be performed at the vendor lab.

Please confirm that this will meet your needs and agrees with our discussion.

Ron Chrzanowski
Corporate Chemistry Manager

PPPP/90

Exelon Nuclear
630-657-3200

Cassidy, John

From: Mitchell, Mark
Sent: Friday, March 25, 2011 10:43 AM
To: Phalen, Martin; Cassidy, John; Go, Tony; Myers, Valerie; Dickson, Billy
Subject: FW: Exelon Environmental Monitoring - Japan Effects

All,

This is the plan from Exelon. They will compile all the results from the fleet and Ron will forward to us the compiled results starting next week and each week any new data is collected. At some point in the next 2 months we will probably see a decreasing trend and they will call us and discuss terminating the program.

So if you have an Exelon plant we will get a centralized data set and there is no need to get individual plant results. This will come directly to Marty and copy to me so we have a back-up. Marty will set up a file on a shared drive and let us know as that develops.

Mark

From: ronald.chrzanowski@exeloncorp.com [mailto:ronald.chrzanowski@exeloncorp.com]
Sent: Thursday, March 24, 2011 2:53 PM
To: Mitchell, Mark
Cc: Darin.Benyak@exeloncorp.com; Dominic.Imburgia@exeloncorp.com; Ronald.Gaston@exeloncorp.com; peter.orphanos@exeloncorp.com; james.meister@exeloncorp.com; Francis.Leone@exeloncorp.com
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PPPP 191

Please confirm that this will meet your needs and agrees with our discussion.

Ron Chrzanowski
Corporate Chemistry Manager
Exelon Nuclear
630-657-3200

Ng, Raymond

From: Krsek, Robert
Sent: Friday, March 25, 2011 9:11 AM
To: Kunowski, Michael; Jandovitz, John
Subject: FW: update on the Effect of Fukushima in USA

Mike- John,

The site received a call from the Wisconsin DNR requesting the site provide any results from testing for detection of isotopes from the Japanese event. The site will be providing that information request to the DNR. The site does not intend on making an Event Notification report to a state agency, as this is only an information request.

Below is the latest data the site compiled (it also has other site information).

The site will provide me whatever they provide to the DNR. We may want to pass this on to Billy Dickson and Jim Lynch, as Jim is the state rep. in the region.

Thanks,

rob

From: Michael J Wilson [mailto:michael.j.wilson@dom.com]
Sent: Friday, March 25, 2011 9:03 AM
To: Krsek, Robert
Cc: Jack Gadzala; Thomas L Breene
Subject: FW: update on the Effect of Fukushima in USA

FYI. I will also ensure you get whatever we provide to the DNR.
Mike

From: James M Hale (Generation - 4)
Sent: Friday, March 25, 2011 6:54 AM
To: Michael J Wilson (Generation - 4)
Subject: FW: update on the Effect of Fukushima in USA

Good update. Mike

From: Aziz A Maly (Generation - 4)
Sent: Friday, March 25, 2011 2:27 AM
To: Cheryl L Olson (Generation - 4)
Cc: James M Hale (Generation - 4); Richard W Adams (Generation - 4); Dan J Shannon (Generation - 4); Michael P Failey (Generation - 4); Darryl M Holschbach (Generation - 4)
Subject: update on the Effect of Fukushima in USA

Here is some available information:

1- Most of the positive results was the I-131 , I am not aware of any Cs-137 results yet
2- Most of the positive results were from rainwater .
3- Berkeley has recorded the highest I-131 of **2.2E-7** uCi/ml in rainwater samples
4- Point peach has recorded results of **1.5E-8** uCi/ml in water precipitation samples
5- North Anna has recorded **6.5E-8** uCi/ml 20 mile from the plant in rainwater samples
6- KPS has recorded

PPPP 192

- **1.36E-7** uCi/ml training building rainwater sample , and Two rivers rainwater sample
- **1.04E-7** uCi/ml from Green Bay rainwater sample

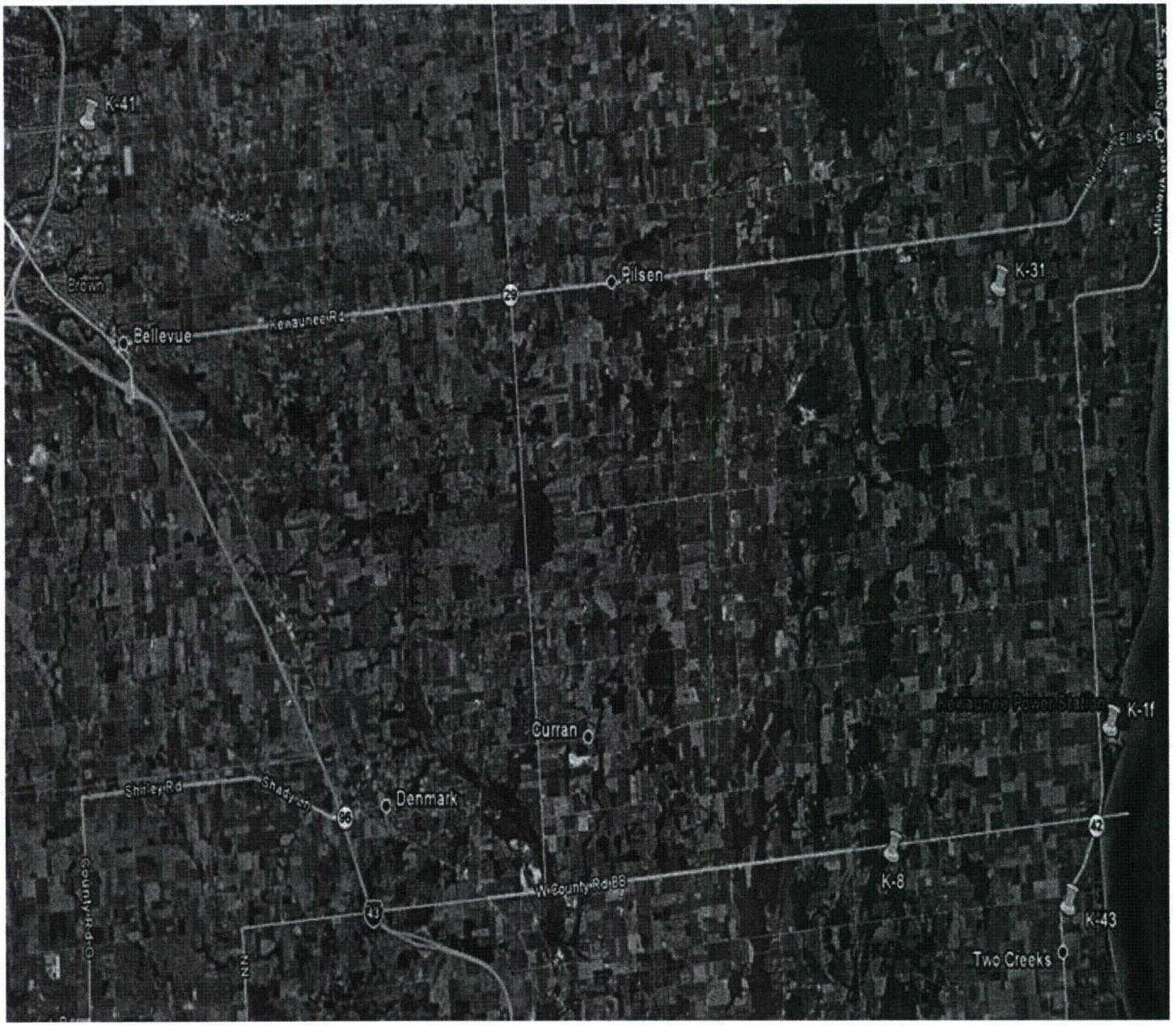
7- I am not aware of any results from air sampling yet

8- We have 6 sampling locations for radioiodine and particulate as part of REMM program see the map below

9- We sample weekly for particulate and bi-weekly for radioiodine . This frequency allow us to collect enough volume to reach the required LLD and better statically results
The required LLD for liquids is 1E-9 uCi/ml while for particulate the LLD is 7E-11 uCi/L

10- Although some plants had put an air sampler for daily collection , I am not aware if any has any positive results

Thanks



Aziz Maly
Health Physicist III
Radiation Protection
Dominion Nuclear -Kewaunee Power Station
(920)388-8731


Please consider the environment before printing this email

Mitchell, Mark

From: ronald.chrzanowski@exeloncorp.com
Sent: Friday, March 25, 2011 10:45 AM
To: Mitchell, Mark
Cc: Phalen, Martin; Darin.Benyak@exeloncorp.com
Subject: Re: NRC Region III data request

Mark and Marty

I will be sending the first of the data and background REMP data to both of you on Monday.

Thanks

Ron Chrzanowski

Sent from my BlackBerry Wireless Handheld

From: Mitchell, Mark <Mark.Mitchell@nrc.gov>
To: Chrzanowski, Ronald A.:(GenCo-Nuc)
Cc: Phalen, Martin <Martin.Phalen@nrc.gov>
Sent: Fri Mar 25 10:36:17 2011
Subject: RE: NRC Region III data request

Ron,

Thanks for the update on the additional sampling. This looks like a good plan. It will be helpful for each site as they conduct the REMP program in 2011.

As I stated on the phone, this centralized approach will make your data analysis and our observation of that data so much more efficient for both parties.

As results become available, copy Marty Phalen at: martin.phalen@nrc.gov and me at: mark.mitchell@nrc.gov

If you have any questions, feel free to call.

Mark Mitchell
630-829-9855

From: ronald.chrzanowski@exeloncorp.com [mailto:ronald.chrzanowski@exeloncorp.com]
Sent: Thursday, March 24, 2011 2:53 PM
To: Mitchell, Mark
Cc: Darin.Benyak@exeloncorp.com; Dominic.Imburgia@exeloncorp.com; Ronald.Gaston@exeloncorp.com; peter.orphanos@exeloncorp.com; james.meister@exeloncorp.com; Francis.Leone@exeloncorp.com
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PPPP|93

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Control location Air particulate cartridge gamma analysis
Control location Charcoal cartridge gamma analysis

The above information will be emailed to you from me weekly starting Monday March 28th, with the available base line data to start, and all new data collected since the event until we agree that it is no longer required. The air particulate and charcoal cartridge gamma analysis will be sent as soon as it can be performed at the vendor lab.

Please confirm that this will meet your needs and agrees with our discussion.

Ron Chrzanowski
Corporate Chemistry Manager
Exelon Nuclear
630-657-3200

King, Mark

From: USGS ENS [ens@usgs.gov]
Sent: Sunday, March 27, 2011 6:47 PM
To: King, Mark
Subject: 2011-03-27 22:23:56 UPDATED: (Mw 6.5) NEAR EAST COAST OF HONSHU, JAPAN 38.4 142.1 (29af8)

6.5 Mw - NEAR EAST COAST OF HONSHU, JAPAN

Preliminary Earthquake Report	
Magnitude	6.5 Mw
Date-Time	27 Mar 2011 22:23:56 UTC 28 Mar 2011 07:23:56 near epicenter 27 Mar 2011 17:23:56 standard time in your timezone
Location	38.405N 142.120E
Depth	5 km
Distances	109 km (68 miles) E (81 degrees) of Sendai, Honshu, Japan 163 km (101 miles) ENE (62 degrees) of Fukushima, Honshu, Japan 169 km (105 miles) SSE (149 degrees) of Morioka, Honshu, Japan 370 km (230 miles) NE (34 degrees) of TOKYO, Japan
Location Uncertainty	Horizontal: 13.1 km; Vertical 5.9 km
Parameters	Nph = 377; Dmin = 404.1 km; Rmss = 0.85 seconds; Gp = 32° M-type = Mw; Version = 8
Event ID	US c0002cqa

For updates, maps, and technical information, see:
Event Page
or
USGS Earthquake Hazards Program

PPPP|94

National Earthquake Information Center
U.S. Geological Survey
http://neic.usgs.gov/

Disclaimer

This email was sent to Mark.King@nrc.gov You requested mail for events between -90.0/90.0 latitude and 180.0/-180.0 longitude for M6.0 between 08:00 and 20:00 and M6.5 other times. To change your parameters or unsubscribe, go to: https://sslearthquake.usgs.gov/ens/

From: LIA05 Hoc
Sent: Sunday, March 27, 2011 3:10 PM
To: Dan Feighert; Andrew Seward; Harry Sherwood; John Simpson; Lisa Hamilton; Michelle Ralston; Rebecca Fontenot; Steve Horwitz; Tim Greten; Vanessa E. Quinn
Cc: Ward, Paul; michael.howe@dhs.gov
Subject: ANS Briefing
Attachments: ANS-Technical-Brief-MOX-Fukushima.pdf

FYI,

Please find the attached.

Ken Wierman Nightshift 1500-2300
FEMA REP Liaison
NRC Operations Center
(301) 816-5187

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PPPP/95

AMERICAN NUCLEAR SOCIETY

555 North Kensington Avenue
La Grange Park, Illinois
60526-5592 USA

Tel: 708/ 352-6611
E-Mail: NUCLEUS@ans.org
http://www.ans.org
Fax: 708/ 352-0499

Date: March 25, 2011

To: Joe Colvin
ANS President

From: Michaele (Mikey) Brady Raap
Chair, ANS Professional Divisions Committee

Below please find the Technical Brief on The Impact of Mixed Oxide Fuel Use on Accident Consequences at Fukushima Daiichi. This Technical Brief contains factual information prepared by the ANS Special Committee on Nuclear Non-Proliferation.

The Impact of Mixed Oxide Fuel Use on Accident Consequences at Fukushima Daiichi

American Nuclear Society Technical Brief – March 2011

Conclusion

Mixed Oxide (MOX) fuel has been used safely in nuclear power reactors for decades. The presence of a limited number of MOX fuel assemblies at Fukushima Daiichi Unit 3 has not had a significant impact on the ability to cool the reactor or on any radioactive releases from the site due to damage from the earthquake and tsunami.

Summary

At the time of the magnitude 9.0 earthquake, Fukushima Daiichi Unit 3 was operating with 32 mixed oxide (MOX) fuel assemblies and 516 low enriched uranium (LEU) fuel assemblies in its reactor core. In other words, less than 6% of the fuel in the Unit 3 core was MOX fuel. There were no other MOX fuel assemblies (new, in operation or used) at the Fukushima Daiichi plant at the time of the accident.

MOX fuel assemblies were loaded into Fukushima Daiichi Unit 3 for the first time in the fall of 2010. The MOX fuel had been used for less than five months at the time of the accident. Differences in initial fuel composition between MOX and LEU fuel can lead to differences in consequences (prompt fatalities and latent cancers) following a core damage event with releases to the environment.

There are indications that Fukushima Daiichi Unit 3 suffered damage to some of its core. The core damage resulted from a loss of core cooling due to damage to plant systems from the tsunami that followed the earthquake. The damage was not related to the presence of MOX fuel.

There have been no prompt fatalities as a result of radiation exposure from Fukushima Daiichi. Prompt evacuation has minimized radiation exposure to the public, so long-term public health consequences from radiation exposure are expected to be small. Given the small number of MOX fuel assemblies at Fukushima Daiichi Unit 3 at the time of the event, coupled with the short time of irradiation of the MOX fuel, it can be concluded that MOX fuel has had and will have no perceptible impact on any consequences from the event.

Background

It is important to note that while LEU fuel begins its useful life with no plutonium, as it is used in a light water reactor it builds up plutonium as a result of the nuclear reactions in the core. By the end of its useful life an LEU fuel assembly contains about 1% plutonium actually generates more power from plutonium than from uranium. All reactor cores contain plutonium; those cores loaded with some MOX fuel contain more.

Mixed oxide (MOX) fuel is comprised of a blend of uranium oxide and plutonium oxide. MOX fuel is predominantly uranium, with average concentrations of plutonium that range from 3-10%. The presence of plutonium produces modest changes in some physical characteristics of the fuel material such as thermal conductivity. However, MOX fuel and low-enriched uranium (LEU) fuel are fundamentally similar. Moreover, the physical dimensions and structural material of a MOX fuel assembly are essentially identical to that of a LEU fuel assembly. To the naked eye, a MOX fuel assembly and a LEU fuel assembly are identical.

Nuclear power plants have been generating electricity for use by the public since the 1950s, and over those years the industry has compiled an enviable safety record. Today over 400 reactors worldwide generate substantial amounts of emissions-free electricity. Dozens of those reactors currently generate power using a mixture of conventional LEU fuel assemblies and MOX fuel assemblies in their reactor cores. The majority of the fuel loaded into these reactors is LEU (60-70% or more), while the remainder (30-40% or less) is MOX. The use of MOX fuel allows the re-use of plutonium that was recovered during nuclear fuel recycling operations. The fabrication and use of MOX fuel has been carried out safely and efficiently on an industrial scale since the 1970s. Safety authorities in France, Belgium, Germany, Switzerland and Japan have all approved the use of MOX fuel in light water reactors using the same rigorous standards that are applied for the licensing of LEU fuel.

Safety is the cornerstone of nuclear power plant operations. Nuclear power plant operators perform safety analyses to determine how the plants will respond during various "what if" problem scenarios. Some of those scenarios involve extreme conditions coupled with multiple equipment failures that lead to estimates of damage to the fuel in the reactor core. Scenarios with significant damage to the reactor core are referred to as severe accidents, and such accidents can result in the calculated release of radionuclides to the environment. Severe accident consequences are the adverse public health effects – fatalities and latent cancers – that arise from the offsite release of radionuclides from a damaged reactor core.

When uranium or plutonium atoms split (fission), they release a relatively large amount of energy which is converted into heat and eventually electricity. The smaller atoms left behind after fission are referred to as fission products. In addition, some of the uranium and plutonium atoms in nuclear fuel assemblies absorb neutrons without fissioning, becoming even heavier atoms called actinides. Both fission products and actinides are radioactive, posing a health hazard if they are released to the environment. Using MOX fuel alters somewhat the "source term," or mix of radionuclides in the core and available for release following a severe accident. The different source term between MOX fuel and LEU fuel leads to different calculated consequences following a postulated severe accident.

In November 1999 the Department of Energy published the Surplus Plutonium Disposition Environmental Impact Statement which documented, among other things, the consequences of four severe accident scenarios at three different reactors using some MOX fuel derived from weapons grade plutonium. Each reactor accident sequence was analyzed with two different reactor core assumptions: a reference case with all LEU fuel, and a second case with a mixed core of approximately 40% MOX fuel and the remainder LEU fuel. For each case the severe accident was assumed to progress in the same manner. Relative to the reference case with all LEU fuel, the offsite consequences to the public with the mixed MOX-LEU core ranged from 4% lower to 22% higher, depending on the reactor studied and the accident sequence. Most cases resulted in consequence increases of 10% or less. The differences between the consequences relate back to differences in the source term. The mixed MOX-LEU core consequences were generally higher because of the presence of more radioactive actinides in the MOX fuel at the time of the postulated accident. However, the differences were modest compared to the uncertainty associated with the consequence calculations for these extremely low probability events.

The type of plutonium used in MOX fuel can also impact severe accident consequences. The aforementioned analysis assumed weapons grade plutonium. If the calculations had been done for MOX fuel containing plutonium from recycled commercial nuclear fuel, as is the practice in Europe and Asia today, the difference between the all uranium cases and the 40% MOX fuel consequences would have been greater than cited above. This is again due primarily to the presence of more radioactive actinides in used "reactor grade" MOX fuel (with plutonium from recycled reactor fuel) than in used weapons grade MOX fuel (with plutonium from retired nuclear weapons).

Turning to the Fukushima Daiichi reactors in Japan, Unit 3 was using some reactor grade MOX fuel at the time of the March 2011 earthquake. Had it been using a 40% MOX fuel core, one could expect an increase in severe accident consequences on the order of 10% for weapons grade MOX. With a 40% reactor grade MOX core, and applying a bounding factor of four increase relative to weapons grade MOX, the overall increase in severe accident consequences would have been on the order of 40% relative to the all LEU fuel case. However, Unit 3 was loaded with only 32 MOX fuel assemblies during refueling operations in the fall of 2010. There are a total of 548 fuel assemblies in the Unit 3 reactor core, so this represents less than 6% of the total fuel in the core. The MOX fuel had been operating in Unit 3 for less than five months; fuel assemblies are typically used for a total of 3-4 years in reactor cores before being replaced by new fuel and discharged to used fuel pools. Therefore, the MOX fuel would have built up relatively few radioactive fission products and actinides at the time of the earthquake and subsequent damage to the reactor core. With these facts in mind – the low percentage of MOX fuel in the core and the short operation time for the MOX fuel – it is evident that the presence of MOX fuel at Fukushima Daiichi Unit 3 has had no significant impact on the offsite releases of radioactivity following the earthquake and tsunami.

Other than the 32 MOX fuel assemblies in the Unit 3 reactor core, at the time of the earthquake there were no other MOX fuel assemblies (new or used) at the Fukushima Daiichi plant. The problems encountered at Fukushima Daiichi reactors stem from plant damage due to the tsunami that followed the earthquake, not the use of MOX fuel in Unit 3.

It is also important to put the public health consequences from the event in perspective. There have been no prompt fatalities as a result of radiation exposure. Moreover, prompt evacuation has minimized the exposure of the population to radiation. At this point, the consequences of the event are expected to be small. MOX fuel effects, if any, would be a small change to an already small number.

In conclusion, MOX fuel has been used safely in nuclear power reactors for decades. The presence of a limited number of MOX fuel assemblies at Fukushima Daiichi Unit 3 has not had a significant impact on the ability to cool the reactor or on any radioactive releases from the site due to damage from the earthquake and tsunami.

Mitchell, Mark

From: ronald.chrzanowski@exeloncorp.com
Sent: Monday, March 28, 2011 3:42 PM
To: Mitchell, Mark; Phalen, Martin
Subject: Exelon Region III Japanese fallout data and background REMP data
Attachments: MWROG Exelon TBE Data.xls; Japanese Fallout data 032811.xls

Mark and Marty

I have attached the background REMP data for the Illinois plants. There is more data than just our last round of samples. It goes back to Oct 2010.

I have also attached all the data we have on the samples we are taking. However, there is very limited data. Quad is the only plant that has rain water data. The Quad data is from people's homes coming from their down spouts during the rain. Otherwise there was not sufficient water to count it.

I will email you additional data each Monday.

Thanks

Ron Chrzanowski
630-657-3200

PPPP|96

Date	Location	Type	Detail	I-131 (pCi/L)	Comments
3/23/2011	Quad Cities	rain	control	29.8	control location
3/24/2011	Quad Cities	rain	offsite	39	10 mile ssw of plant Port Byron, IL

From: LIA07 Hoc
Sent: Monday, March 28, 2011 3:57 AM
To: OST04 Hoc
Subject: FW: USNRC Earthquake-Tsunami Update.032811.0430EDT.docx
Attachments: USNRC Earthquake-Tsunami Update.032811.0430EDT.docx

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From: LIA07 Hoc
Sent: Monday, March 28, 2011 3:49 AM
To: Liaison Japan
Subject: USNRC Earthquake-Tsunami Update.032811.0430EDT.docx

Please find attached the 0430 EDT 3/28/11 NRC Status Update.

If you have any comments or edits for the next update, scheduled for 1800 EDT today, please let me know.

Thank you,

- Caroline

Caroline Nguyen
US Nuclear Regulatory Commission
LIA07.HOC@nrc.gov
Caroline.Nguyen@nrc.gov

PPPP/97

From: LIA07 Hoc
Sent: Monday, March 28, 2011 6:51 PM
To: OST04 Hoc
Subject: FW: FYI - March 28 1500 EDT one pagerFin.docx
Attachments: March 28 1500 EDT one pagerFin.docx

One Pager for Go Books ...

From: ET05 Hoc
Sent: Monday, March 28, 2011 5:29 PM
To: LIA07 Hoc
Subject: FW: FYI - March 28 1500 EDT one pagerFin.docx

From: Weber, Michael
Sent: Monday, March 28, 2011 4:09 PM
To: Jaczko, Gregory
Cc: Batkin, Joshua; Borchardt, Bill; Virgilio, Martin; Wiggins, Jim; OST02 HOC; ET01 Hoc; ET05 Hoc; FOIA Response.hoc Resource
Subject: FYI - March 28 1500 EDT one pagerFin.docx

Good morning (JST), Chairman. Thought you might like an update prior to your departure.

From: Blount, Tom
Sent: Monday, March 28, 2011 2:53 PM
To: Weber, Michael; McDermott, Brian; Zimmerman, Roy
Cc: LIA06 Hoc; Hoc, PMT12; RST01 Hoc
Subject: March 28 1500 EDT one pagerFin.docx

This is the 1500 Turnover...

Thanks,
Tom

PPPP/98

Phalen, Martin

From: Zurawski, Paul
Sent: Tuesday, March 29, 2011 2:26 PM
To: Dickson, Billy; Phalen, Martin
Subject: Prairie Island I-131 Activity
Attachments: I-131 (Prairie Island)pdf.pdf

During the Branch 4 morning call today I mentioned that the licensee indicated they have indication of I-131 in both water station samples and air sample data (including charcoal filters). After indicating that I was going to try to obtain more detailed information, it was mentioned that DRS was taking the lead regarding I-131 being seen in samples around the Region. To reduce duplicate efforts, it was suggested that I communicate with you. Since our Branch meeting this morning, the licensee stopped by and provided some more specific data than I had earlier this morning. The attachment to this message provides that information and I also understand that it forms the basis for seven questions Marty asked the licensee. It is my understanding that the licensee will be providing it's official response to Marty later today.

Paul Zurawski
NRC Resident Inspector
Prairie Island Nuclear Generating Plant
Telephone: 651-388-8209
Fax: 651-388-8200

PPPP/99

The answers to the following questions only include data from March, 2011.

1. Drinking water station sample results including sample locations, dates results and MDA.

Samples of City of Red Wing drinking water were taken on 3/8/11, 3/15/11, and 3/22/11. The monthly composite of these samples has not been analyzed. The LLD for I-131 is 1 pCi/L. The quarterly composite for tritium has also not been analyzed. The LLD for tritium is approximately 150 pCi/L.

Samples from offsite resident wells (Hansen and Peterson) were taken 3/16/11 for the special tritium analysis. These samples have not yet been analyzed. The LLD for tritium is 19 pCi/L.

2. Non-drinking water sample results including sample location, dates, results, and MDA.

Samples of upstream and downstream Mississippi River water were taken on 3/8/11, 3/15/11, and 3/22/11. The monthly composite of these samples has not been analyzed. The LLD for I-131 is 1 pCi/L. The quarterly composite for tritium has also not been analyzed. The LLD for tritium is approximately 150 pCi/L.

Samples from onsite monitoring wells P-10, MW-7 and MW-8 were taken 3/16/11 for the special tritium analysis. These samples have not yet been analyzed. The LLD for tritium is 19 pCi/L.

Samples of rain/snow runoff were taken as described below with the results shown below:

Location	Date	I-131 Activity (uCi/mL)
Old Admin Building Roof	3/23/11	<1.99E-8
Plant Parking Lot	3/24/11	2.82E-8
Plant Parking Lot (repeat)	3/24/11	<1.69E-8
Peterson Farm (offsite)	3/24/11	<1.06E-8
Kinneman Farm (offsite)	3/24/11	2.12E-8

3. Air sample data (including charcoal filters) including sample location, dates, results, and MDA.

Samples of particulate and charcoal filters were taken at air monitoring stations P-1, P-2, P-3, P-4, and P-6 on 3/8/11, 3/15/11, and 3/22/11. The only samples with positive I-131 results are shown below. The LLD for gross beta is 0.005 pCi/m^3, and 0.03 pCi/m^3 for I-131.

For the March 22, 2011 Air Iodine collection,

Loc.	Vol. (m3)	I-131 (pCi/m3)
P-1	431	0.042 ± 0.012
P-2	429	0.028 ± 0.015
P-3	429	0.027 ± 0.013
P-4	430	0.034 ± 0.017
P-6	429	0.030 ± 0.015

4. Milk sample results including sample location, dates, results, and MDA.

Milk samples were taken from sample locations P-43, P-37, P-18, and P-42 on 3/13/11. These samples have not been analyzed. The LLD for I-131 is 0.5 pCi/L.

5. Comments and/or insights based on recent radiological observations.

The I-131 activity is from the Fukushima nuclear accident.

The dairy cows are currently on stored feed and the milk should not be affected.

The area near PI does not have reservoirs used for drinking water that could be affected by fallout.

6. Were there any changes to PINGP's sample frequencies?

No changes were made to the REMP sampling frequency. Additional rain/snow runoff samples were taken to capture the Fukushima event.

7. Were there any changes to the isotopes that PINGP is looking for?

No. Based on the Chernobyl event, the expected isotopes are I-131, Cs-134, Cs-137, and Ru-106. All of these isotopes are included in the analyses already performed.

From: LIA05 Hoc
Sent: Wednesday, March 30, 2011 4:19 PM
To: FOIA Response.hoc Resource
Subject: FW: Liaison Team Computer Assignments
Attachments: Liaison Team Computer Assignments.docx

Bonnie Sheffield Dayshift 0700-1500
Ken Wierman Nightshift 1500-2300
FEMA REP Liaison
NRC Operations Center
(301) 816-5187

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From: OST05 Hoc
Sent: Thursday, March 17, 2011 2:03 PM
To: LIA06 Hoc; LIA08 Hoc; LIA04 Hoc; OST05 Hoc; LIA09 Hoc; LIA05 Hoc; LIA01 Hoc; LIA11 Hoc; LIA12 Hoc; LIA03 Hoc; LIA02 Hoc; LIA10 Hoc
Subject: FYI: Liaison Team Computer Assignments

In case you need to forward something to another team member, attached are the computer assignments around the Liaison Team room.

Alison Rivera
State Liaison – Liaison Team
Incident Response Center

PPPP/100

Liaison Team Computer Assignments for Japanese Response

Computer Name	Assigned Desk
LIA06	LT Director
LIA08	LT Coordinator
LIA04	State Liaison Desk 1
OST05	State Liaison Desk 2
LIA09	LT Technical Advisor
LIA05	FEMA Liaison to the NRC
LIA01	Federal Liaison Desk 1
LIA11	Federal Liaison Desk 2
LIA12	Congressional Liaison Desk
LIA03	International Liaison Desk 1
LIA02	International Liaison Desk 2
LIA10	International Liaison Desk 3 (Interpreter)

From: LIA05 Hoc
Sent: Thursday, March 17, 2011 2:57 PM
To: Andrew Seward; Harry Sherwood; Michelle Ralston; Steve Horwitz; Tim Greten; Vanessa E. Quinn
Subject: FW: Liaison Team Computer Assignments
Attachments: Liaison Team Computer Assignments.docx

Positions in the Liaison Room their email addresses are the computer name Hoc@nrc.gov.

FEMA REP Liaison
NRC Operations Center
(301) 816-5187

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From: OST05 Hoc
Sent: Thursday, March 17, 2011 2:03 PM
To: LIA06 Hoc; LIA08 Hoc; LIA04 Hoc; OST05 Hoc; LIA09 Hoc; LIA05 Hoc; LIA01 Hoc; LIA11 Hoc; LIA12 Hoc; LIA03 Hoc; LIA02 Hoc; LIA10 Hoc
Subject: FYI: Liaison Team Computer Assignments

In case you need to forward something to another team member, attached are the computer assignments around the Liaison Team room.

Alison Rivera
State Liaison – Liaison Team
Incident Response Center

Liaison Team Computer Assignments for Japanese Response

Computer Name	Assigned Desk
LIA06	LT Director
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LIA09	LT Technical Advisor
LIA05	FEMA Liaison to the NRC
LIA01	Federal Liaison Desk 1
LIA11	Federal Liaison Desk 2
LIA12	Congressional Liaison Desk
LIA03	International Liaison Desk 1
LIA02	International Liaison Desk 2
LIA10	International Liaison Desk 3 (Interpreter)