Satorius, Mark

From: Satorius, Mark
Sent: Tuesday, March 15, 2011 6:54 AM
To: LIA07 Hoc
Cc: Pederson, Cynthia
Subject: RE: 0600 EDT (March 15 2011) USNRC Earthquake/Tsunami SitRep

I will be out of the office starting tomorrow. Pls include Cynthia Pederson, RIII Dep Regional Administrator, on these updates. I have cc'ed cindy, so you will have her email address

---

From: LIA07 Hoc
Sent: Tuesday, March 15, 2011 5:02 AM
To: Al Coons; Appleman Binkert; Bill King; Bill King 2; Charles Burrows; Charles Donnell; Conrad Burnside; Dan Feighert; Darrell Hammons; DOE NIT; DOT; DTRA; dudek; Elmer Naples; EOP; EPA; EPA2; Eric Sinibaldi; Gregory Simonson; Harry Sherwood; HHS; J Szymanski; Jim Kish; Johanna Berkey; John Holdren; K Donald; Karyn Keller; Lisa Hammond; Lukas McMichael; Maceck; Michelle Ralston; Nan Calhoun; Navy; NOC; NOC Duty Director; Nuclear SSA; Peter Lyons; Rebecca Thomson; RMT; Ron McCabe; Seamus O'Boyle; State; Stephen Trautman; Steve Colman; Steve Horwitz; Thomas Conran; Thomas Zerr; Tim Greten; Vanessa Quinn; William Webb; Andersen, James; Anderson, Joseph; Barker, Allan; Batkin, Joshua; Bradford, Anna; Brenner, Eliot; Bubar, Patrice; Castleman, Patrick; Coggins, Angela; Collins, Brendan; Collins, Elmo; Dean, Bill; Decker, David; Dorman, Dan; Droggitis, Spiros; Franovich, Mike; Gibbs, Catina; Hahn, Matthew; Haney, Catherine; Harrington, Holly; Hipschman, Thomas; HOO Hoc; Howell, Art; Howell, Linda; Jaczko, Gregory; Johnson, Andrea; Johnson, Michael; Kahler, Robert; Leeds, Eric; Logaras, Harral; Loyd, Susan; Maier, Bill; Marshall, Michael; McCree, Victor; McDermott, Brian; McNamara, Nancy; Miller, Charles; Miller, Chris; Monninger, John; Nieh, Ho; NSIR_DDSP_ILTAB_Distribution; Orders, William; Ostendorff, William; Pace, Patti; Pearson, Laura; Satorius, Mark; Schmidt, Rebecca; Sharkey, Jeffry; Sheron, Brian; Snodderly, Michael; Sosa, Belkys; Speiser, Herald; Tifft, Doug; Trapp, James; Trojanowski, Robert; Warren, Roberta; Wiggins, Jim; Williams, Kevin; Wittick, Brian; Woodruff, Gena
Subject: 0600 EDT (March 15 2011) USNRC Earthquake/Tsunami SitRep

Attached, please find a March 15, 2011, 0600 EDT situation report from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami. 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.

-Rebecca

Rebecca Stone
Office of Nuclear Security & Incident Response
US Nuclear Regulatory Commission
Lia07.HOC@nrc.gov (Operations Center)
Rebecca.Stone@nrc.gov

W/101

Satorius, Mark

From: Mitlyng, Viktoria
Sent: Tuesday, March 15, 2011 4:54 PM
To: Satorius, Mark; Pederson, Cynthia
Subject: FW: Senate Hearing on Thursday

In addition to Wednesday's hearing, another hearing on Thursday. See below

---

From: Harrington, Holly
Sent: Tuesday, March 15, 2011 4:47 PM
To: Brenner, Eliot; Burnell, Scott; Couret, Ivonne; Hayden, Elizabeth; McIntyre, David; Chandrathil, Prema; Dricks, Victor; Hannah, Roger; Ledford, Joey; Mitlyng, Viktoria; Screnci, Diane; Sheehan, Neil; Uselding, Lara
Cc: Landau, Mindy
Subject: Senate Hearing on Thursday

New: **Nuclear Crisis in Japan**

Senate Environment and Public Works Committee (Chairwoman Boxer, D-Calif.) will hold a briefing on the ongoing crisis associated with nuclear power facilities in Japan, including potential ramifications for the United States. *3:30 p.m., 406 Dirksen*

W/102

Release

220

Satorius, Mark

From:	Satorius, Mark
Sent:	Tuesday, March 15, 2011 3:12 PM
To:	Home
Subject:	FW: mark Is
Attachments:	image001.jpg; image002.jpg; image002.jpg

From: Ring, Mark
Sent: Tuesday, March 15, 2011 3:00 PM
To: Pederson, Cynthia; Satorius, Mark; Shear, Gary; West, Steven
Subject: FW: mark Is

Go to slide number 10 at the bottom for a before and after picture of Fukushima Daiichi.

From: Lara, Julio
Sent: Tuesday, March 15, 2011 2:50 PM
To: Ring, Mark; Riemer, Kenneth
Subject: mark Is

http://www.msnbc.msn.com/id/42094554/ns/world_news-asiapacific/

Julio Lara, P.E.
TSS Team Leader, DRP, RIII
630.829.9731

W/103

Satorius, Mark

From: Satorius, Mark
Sent: Tuesday, March 15, 2011 3:09 PM
To: All R3 Users
Subject: Update on Japan
Attachments: USNRC Earthquake-Tsunami Update.031511.1330EDT.DOCX

Another Update. As I indicated on previous emails, note the 'Official Use Only' – please follow agency rules on handling this information, which includes, but not limited to, refraining from sharing this outside of the agency. Also note the disclaimer that the information may be dated and subject to constant change. Mark

W/104

Satorius, Mark

From: LIA04 Hoc
Sent: Tuesday, March 15, 2011 2:36 PM
To: Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; Maier, Bill; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena; Collins, Elmo; Dean, Bill; Heck, Jared; McCree, Victor; Satorius, Mark; Flannery, Cindy; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michelle; Turtil, Richard; Virgilio, Rosetta
Subject: NRC Presss Release: NRC Analysis Continues to Support Japan's Protective Actions
Attachments: 11-049.pdf

Latest press release

Alison Rivera
State Liaison

From: McIntyre, David
Sent: Tuesday, March 15, 2011 3:24 PM
To: taskforce-1@state.gov
Cc: LIA04 Hoc
Subject: FW: NRC Analysis Continues to Support Japan's Protective Actions

Per our Liaison Team's request.

David McIntyre
NRC Public Affairs

From: opa administrators [mailto:opa@nrc.gov]
Sent: Tuesday, March 15, 2011 3:56 PM
To: McIntyre, David
Subject: NRC Analysis Continues to Support Japan's Protective Actions

W/105

From: Leeds, Eric — NRR
To: McCree, Victor — RII
Cc: Grobe, Jack; Boger, Bruce; Virgilio, Martin; Sanfilippo, Nathan; Croteau, Rick; Rich, Daniel; Wert, Leonard
Subject: RE: CR3 News Release
Date: Tuesday, March 15, 2011 5:21:02 PM
Attachments: image001.png

Thanks, Vic. Too bad.

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

From: McCree, Victor — RII
Sent: Tuesday, March 15, 2011 4:10 PM
To: Leeds, Eric — NRR
Cc: Grobe, Jack; Boger, Bruce; Virgilio, Martin; Sanfilippo, Nathan; Croteau, Rick; Rich, Daniel; Wert, Leonard
Subject: FW: CR3 News Release

Eric,

See attached. As we discussed, based on this information and Progress Energy's announcement, we will cancel the public restart meeting scheduled for March 22.

Vic

From: Hannah, Roger — RII
Sent: Tuesday, March 15, 2011 3:57 PM
To: McCree, Victor; Wert, Leonard; Rich, Daniel; Croteau, Rick; Jones, William
Cc: Brenner, Eliot; Harrington, Holly; Burnell, Scott; Ledford, Joey; Morrissey, Thomas
Subject: CR3 News Release

Progress Energy plans to issue this release in a few minutes....

Roger Hannah, APR
Senior Public Affairs Officer
Region II -- Atlanta, Ga.
Office - 404-997-4417
Cell - 404-520-4394
roger.hannah@nrc.gov

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

W/106

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Appendix A

Reeves, Rosemary

From: ANS DCSection [ans.dcsection@gmail.com]
Sent: Tuesday, March 15, 2011 10:43 AM
To: ans.dcsection
Subject: Re: Talking Points on Implications of Fukushima Accident to U.S. Nuclear Plants

Below is the text of the attachment for those of you who couldn't access the previously attached file. ~Suzanne

---

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

ANS Member Talking Points

Implications to U.S. nuclear energy program from the Japanese earthquake

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

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

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

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

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

W/107

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

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

On Tue, Mar 15, 2011 at 9:58 AM, ANS DCSection <ans.dcsection@gmail.com> wrote:
FYI. The below email is from National ANS.

-----Original Message-----
From: Joe Colvin [mailto:president@ans.org]
Sent: Monday, March 14, 2011 2:46 AM
To: Witt, Kevin
Subject: Talking Points on Implications of Fukushima Accident to U.S. Nuclear Plants

Dear ANS Members:

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

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

Thank you all for your strong support!

Joe

Schaperow, Jason

From: Schaperow, Jason
Sent: Tuesday, March 15, 2011 8:50 PM
To: Hasselberg, Rick
Subject: RE: Ops Center

Hi Rick,

Thanks for your consideration. Turns out I was downtown with the Chairman and his staff and just got back. I was asked to go down to Capitol Hill tomorrow as well.

Thanks again,
Jason

From: Hasselberg, Rick
Sent: Tuesday, March 15, 2011 2:20 PM
To: Schaperow, Jason; Santiago, Patricia
Cc: Tinkler, Charles
Subject: RE: Ops Center

Folks,

You shouldn't be working two shifts in a 24 hour period. That's why we ask our responders and their management to arrange for the night shift folks to be excused to get some rest. Jason, if you've been up all day, don't come in.

Rick

From: Schaperow, Jason
Sent: Tuesday, March 15, 2011 10:25 AM
To: Santiago, Patricia
Cc: Tinkler, Charles; Hasselberg, Rick
Subject: Ops Center

Hi Pat,

This morning, I called the Ops Center and spoke with Rick Hasselberg. I told him that when I was in the Ops Center yesterday, they did not have a list of events for each reactor, together with a time each event happened. I said that I could not predict what will happen without a list of what happened and when. I requested that he develop such a list of events with approximate times.

I also requested that he move me from the shift that starts at 11:00 p.m. tonight to an earlier shift. (This is the same request I made to Rollie Berry in the Ops Center yesterday.) I pointed out that I will be exhausted if I have to work a graveyard shift tonight, and my effectiveness as a resource on spent fuel pool and reactor accidents will be much reduced.

Jason

W/108

Schaperow, Jason

From: Schaperow, Jason
Sent: Tuesday, March 15, 2011 10:49 PM
To: Santiago, Patricia
Subject: RE: Ops Center

Thanks.

From: Santiago, Patricia
Sent: Tuesday, March 15, 2011 9:14 PM
To: Schaperow, Jason; Tinkler, Charles; Chang, Richard
Subject: RE: Ops Center

Thanks Jason, I was actually just emailing to see if you were back yet. After 8 pm i passed jennifer's car parked in the garage...get some well deserved rest!
let me know how it goes tomorrow.

From: Schaperow, Jason
Sent: Tuesday, March 15, 2011 8:57 PM
To: Santiago, Patricia; Tinkler, Charles; Chang, Richard
Subject: FW: Ops Center

Jennifer asked me to go to Capitol Hill tomorrow to support the NRC Chairman's meetings with Congress. We are taking a van that leaves OWFN at 7:30 a.m.

Thanks for your support today.

From: Schaperow, Jason
Sent: Tuesday, March 15, 2011 8:50 PM
To: Hasselberg, Rick
Subject: RE: Ops Center

Hi Rick,

Thanks for your consideration. Turns out I was downtown with the Chairman and his staff and just got back. I was asked to go down to Capitol Hill tomorrow as well.

Thanks again,
Jason

From: Hasselberg, Rick
Sent: Tuesday, March 15, 2011 2:20 PM
To: Schaperow, Jason; Santiago, Patricia
Cc: Tinkler, Charles
Subject: RE: Ops Center

Folks,

You shouldn't be working two shifts in a 24 hour period. That's why we ask our responders and their management to arrange for the night shift folks to be excused to get some rest. Jason, if you've been up all day, don't come in.

W/109

Rick

From: Schaperow, Jason
Sent: Tuesday, March 15, 2011 10:25 AM
To: Santiago, Patricia
Cc: Tinkler, Charles; Hasselberg, Rick
Subject: Ops Center

Hi Pat,

This morning, I called the Ops Center and spoke with Rick Hasselberg. I told him that when I was in the Ops Center yesterday, they did not have a list of events for each reactor, together with a time each event happened. I said that I could not predict what will happen without a list of what happened and when. I requested that he develop such a list of events with approximate times.

I also requested that he move me from the shift that starts at 11:00 p.m. tonight to an earlier shift. (This is the same request I made to Rollie Berry in the Ops Center yesterday.) I pointed out that I will be exhausted if I have to work a graveyard shift tonight, and my effectiveness as a resource on spent fuel pool and reactor accidents will be much reduced.

Jason

Schaperow, Jason

From: Schaperow, Jason
Sent: Tuesday, March 15, 2011 12:41 PM
To: 'kcw@dycoda.com'
Subject: RE: Plots for your Uhle Breifing

Got it. Thanks.

From: Casey Wagner [mailto:kcw@dycoda.com]
Sent: Tuesday, March 15, 2011 12:23 PM
To: Schaperow, Jason
Cc: Tinkler, Charles; Chang, Richard
Subject: Plots for your Uhle Breifing

A couple of points –

1. Scaled level decrease by scaling time by 1/2.69 (which is 480 more assemblies) – See Level 2
2. Environment on RB refueling floor is scorching hot, ~212 F due to pure steam environment before core damage
3. Gamma shine from pool is horrendous
4. Fukashima is smaller than PB. Only 780 MW electrical.

From: Schaperow, Jason [mailto:Jason.Schaperow@nrc.gov]
Sent: Tuesday, March 15, 2011 9:09 AM
To: kcw@dycoda.com
Cc: Tinkler, Charles; Chang, Richard
Subject: telecon

Just to confirm our telecom that we had a few minutes ago...

Fukushima Daiichi unit 4 may be having a spent fuel pool meltdown.
Fukushima Daiichi unit 4 has a full core offload in its spent fuel pool.
We are planning to give to the NRC Chairman information on spent fuel pool boil-off times (and maybe spent fuel heatup times).

We need you to do boil-off calculations just like the attached, but for a full core offload into the pool. We need it for 3 decay times (20 days, 90 days, and 365 days). Also, if you could get it to run until the level reaches core mid-plane that would be even better.

w/110

Schaperow, Jason

From: Gauntt, Randall O [rogaunt@sandia.gov]
Sent: Tuesday, March 15, 2011 12:41 PM
To: Schaperow, Jason
Subject: RE: Pool Dose Rate Estimate for Uncovering SFP

I found the better one – will send along.
More realistic.

From: Schaperow, Jason [mailto:Jason.Schaperow@nrc.gov]
Sent: Tuesday, March 15, 2011 10:40 AM
To: Gauntt, Randall O
Subject: RE: Pool Dose Rate Estimate for Uncovering SFP

Got it . Thanks.

From: Gauntt, Randall O [mailto:rogaunt@sandia.gov]
Sent: Tuesday, March 15, 2011 12:36 PM
To: Schaperow, Jason; Tinkler, Charles
Cc: 'Ali.Tehrani@hse.gsi.gov.uk'; 'Kelly, John E (NE)'
Subject: Pool Dose Rate Estimate for Uncovering SFP

Note that this assumes 1 billion curies. It's a rough order magnitude estimate.

Somewhere I did a more detailed analysis that considered the fraction of the fuel under water when the water falls below the top of the fuel assemblies.

Randy

W/111

From: Mathew, Roy
To: Taylor, Robert
Cc: McConnell, Matthew; Sahay, Prem; Scales, Kerby; Wilson, George; Hiland, Patrick; Skeen, David
Subject: RE: Question on Japanese/US Batteries
Date: Tuesday, March 15, 2011 10:14:29 AM

Rob: Here is the write-up

U.S. nuclear power plants utilize nuclear-grade (i.e., Class 1E, safety-related) batteries as emergency power supplies for various design basis events, station blackout (10 CFR 50.63), and fire protection (Appendix R). Nuclear-grade batteries are qualified in accordance with Regulatory Guide 1.158 which provides an acceptable method for satisfying the Commission's regulations with respect to qualification of safety-related lead storage batteries for nuclear power plants. Nuclear power plant structures, systems, and components important to safety are designed to withstand natural phenomena such as earthquakes, tornadoes, tsunami, and floods in accordance with 10 CFR 50, Appendix A, General Design Criterion (GDC) 2. GDC 2 is applicable to both nuclear-grade batteries and the structures that house them. Additionally, nuclear-grade batteries are sized and routinely tested in accordance with plant technical specifications to ensure adequate capacity and capability exists to perform their intended safety functions. For U.S. nuclear power plants, the typical design duty cycles for nuclear-grade batteries range from 1 -8 hrs.

Any questions, please give me a call.

Thanks,

Roy

From: Taylor, Robert
Sent: Monday, March 14, 2011 6:51 PM
To: Hiland, Patrick; Skeen, David
Cc: Mathew, Roy
Subject: Question on Japanese/US Batteries

Pat and Dave,

I am preparing the Chairman's Q&As related the events in Japan. One has come up related to the effectiveness of batteries. I am requesting your staff's support in preparing a response. I would appreciate getting a concise answer that the Chairman can use to briefly respond to questions from external stakeholders. A response by COB Tuesday would be greatly appreciated.

The question is:

Is our [U.S.] battery backup power less effective than the Japanese?

Let me know if you have any questions.

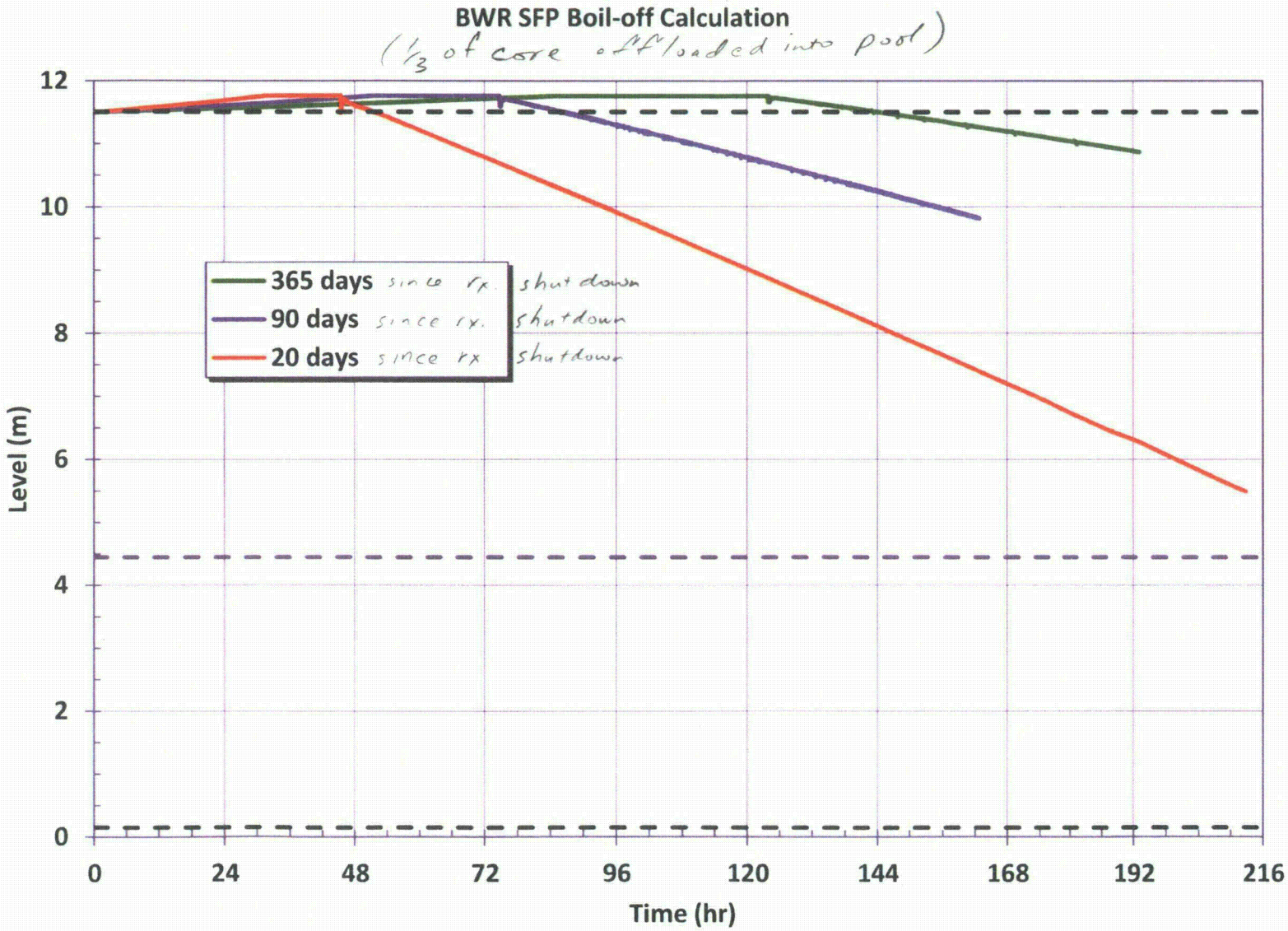
w/112

Regards,
Rob

Schaperow, Jason

From: Schaperow, Jason
Sent: Tuesday, March 15, 2011 10:36 AM
To: 'kcw@dycoda.com'
Subject: boil-off plot attached for 1/3rd core offload
Attachments: KSS100_20110315_16131631.pdf

W/113


BWR SFP Boil-off Calculation
(1/3 of core offloaded into pool)
365 days since rx. shutdown
90 days since rx. shutdown
20 days since rx shutdown
Level (m)
Time (hr)
0
2
4
6
8
10
12
0
24
48
72
96
120
144
168
192
216

Schaperow, Jason

From: Schaperow, Jason
Sent: Tuesday, March 15, 2011 11:09 AM
To: 'kcw@dycoda.com'
Subject: RE: Section 3.3

Thanks. I will look at it.

From: Casey Wagner [mailto:kcw@dycoda.com]
Sent: Tuesday, March 15, 2011 11:05 AM
To: Schaperow, Jason
Subject: Section 3.3

Hi Jason,

Section 3.3 describes the whole pool model.

KC

w/114

MKR

From: Wilson, George
To: Taylor, Robert; Mathew, Roy; McConnell, Matthew
Cc: Hiland, Patrick; Skeen, David; Thomas, Eric; Sigmon, Rebecca; King, Mark
Subject: Battery Answer
Date: Tuesday, March 15, 2011 2:31:29 PM

Rob, use this answer in lieu of what was previously sent

We currently do not have sufficient information to compare the differences in design requirements and performance characteristics of nuclear-grade batteries in the U.S. and Japanese nuclear power plants. However, in the U.S., nuclear power plants utilize redundant nuclear-grade (i.e., Class 1E, safety-related) batteries that are designed and constructed using rigorous standards and are routinely tested in accordance with plant technical specifications to ensure adequate capacity and capability exists to perform their intended safety functions. These batteries are located in structures that can withstand natural phenomena such as earthquakes, tornadoes, tsunami, and floods in accordance with NRC regulations. For U.S. nuclear power plants, the typical design duty cycles for safety grade batteries range from 1-8 hrs.

George Wilson
USNRC
EICB Branch Chief, Division of Engineering
Mail Stop O12H2
301-415-1711

W/115

Schaperow, Jason

From: Schaperow, Jason
Sent: Tuesday, March 15, 2011 12:40 PM
To: 'Gauntt, Randall O'
Subject: RE: Pool Dose Rate Estimate for Uncovering SFP

Got it . Thanks.

From: Gauntt, Randall O [mailto:rogaunt@sandia.gov]
Sent: Tuesday, March 15, 2011 12:36 PM
To: Schaperow, Jason; Tinkler, Charles
Cc: 'Ali.Tehrani@hse.gsi.gov.uk'; 'Kelly, John E (NE)'
Subject: Pool Dose Rate Estimate for Uncovering SFP

Note that this assumes 1 billion curies. It's a rough order magnitude estimate.

Somewhere I did a more detailed analysis that considered the fraction of the fuel under water when the water falls below the top of the fuel assemblies.

Randy

W/116

Schaperow, Jason

From: Schaperow, Jason
Sent: Tuesday, March 15, 2011 10:05 AM
To: ODonnell, Edward
Subject: RE: Liquefaction Video - Japan

Strange.

-----Original Message-----
From: ODonnell, Edward
Sent: Tuesday, March 15, 2011 7:18 AM
Subject: FW: Liquefaction Video - Japan

The link is to an amateur video take last Friday in Japan after the earthquake showing water boiling up in a park.

The cause of the water boiling up could be soil liquefaction from the earthquake or broken pipes. The site is viewable here at NRC.

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

w/117

Schaperow, Jason

From: Schaperow, Jason
Sent: Tuesday, March 15, 2011 10:04 AM
To: 'kcw@dycoda.com'
Subject: Please call me about Fukushima Daiichi Unit 4 Spent Fuel Pool. Thanks.

Importance: High

Please call me about Fukushima Daiichi Unit 4 Spent Fuel Pool. Thanks.

W/118

Pulvirenti, April

From: Pulvirenti, April
Sent: Tuesday, March 15, 2011 9:55 AM
To: Stevens, Gary
Subject: New NEI update

The fire at FK 4 was a lube oil fire. Not sure how this impacts the spent fuel...

W/119

Pulvirenti, April

From: Pulvirenti, April
Sent: Tuesday, March 15, 2011 8:42 AM
To: Stevens, Gary
Subject: RE: Some sense....

Yes, it does make much more sense, but what would expose the fuel in the storage pool? All the residual heat should have been gone before they offloaded the core. Did they lose all the water and it went critical again? But how would it go critical without water to moderate neutrons?

The previous report NEI said there was a hole in the reactor at #2 – but they may be referring to the torus. I don't think we'll know anything solid for months.

From: Stevens, Gary
Sent: Tuesday, March 15, 2011 8:31 AM
To: Pulvirenti, April
Subject: RE: Some sense....

NOT the spent fuel pool, but the fuel storage pool. They were in an outage and all fuel had been off-loaded from the RPV. Now, it makes sense.

Gary L. Stevens
Senior Materials Engineer
NRC/RES/DE/CIB
Gary.Stevens@nrc.gov
301-251-7569

From: Stevens, Gary
Sent: Tuesday, March 15, 2011 8:17 AM
To: Pulvirenti, April
Subject: Some sense....

http://www.nei.org/newsandevents/information-on-the-japanese-earthquake-and-reactors-in-that-region/

Gary L. Stevens
Senior Materials Engineer
NRC/RES/DE/CIB
Gary.Stevens@nrc.gov
301-251-7569

W/120

Schaperow, Jason

From: Schaperow, Jason
Sent: Tuesday, March 15, 2011 8:18 AM
To: ODonnell, Edward
Subject: RE: Sources of information.

Thanks.

From: ODonnell, Edward
Sent: Monday, March 14, 2011 4:42 PM
Subject: Sources of information.

The first three are Japanese sites. The last one is a Russian news site. The Russians are 600 miles to the north so they have a vested interest in what is going on in Japan.

.....
http://www.nisa.meti.go.jp/english/index.html

http://www.tepco.co.jp/en/press/corp-com/release/index-e.html

http://www.yomiuri.co.jp/dy/

http://rt.com

W/121

Schaperow, Jason

From: Schaperow, Jason
Sent: Wednesday, March 16, 2011 6:06 AM
To: Gauntt, Randall O
Subject: RE: Thanks

Thanks.

Jason

From: Gauntt, Randall O [rogaunt@sandia.gov]
Sent: Tuesday, March 15, 2011 11:11 PM
To: Schaperow, Jason; 'kcw@dycoda.com'
Subject: Re: Thanks

Jason,
Congratulation on the exposure and the important role you are playing. We are proud of you!

Randy

----- Original Message -----
From: Schaperow, Jason [mailto:Jason.Schaperow@nrc.gov]
Sent: Tuesday, March 15, 2011 08:53 PM
To: Gauntt, Randall O; kcw@dycoda.com <kcw@dycoda.com>
Subject: Thanks

Hi Randy and KC,

Thanks for your support today. I gave your graphs to Chairman Jaczko as part of his preparation to meet with a Congressional committee tomorrow. I will be accompanying him and senior NRC staff to the committee meeting tomorrow.

Thanks again,
Jason

W/122

Appendix A

Reeves, Rosemary

From: Nuclear Plant Journal [anu@goinfo.com]
Sent: Monday, April 18, 2011 6:07 PM
To: Reeves, Rosemary
Subject: NPJ E-News April 18, 2011 Fukushima Update

Having trouble viewing this email? Click here

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An International Publication
Published in the United States

Nuclear Plant Journal E-News

Japan Update
April 18, 2011

In this issue of NPJ E-News you'll find an update of the Fukushima Nuclear Plants in Japan. Information is current as of April 18, 2011, 16:00 CDT. All items are directly quoted, without any editing.

In this issue

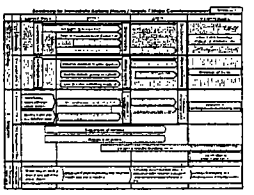
TEPCO Update

JAIF Updates

TEPCO Update

From the TEPCO website:

- **Roadmap towards Restoration from the Accident at Fukushima Daiichi Nuclear Power Station**

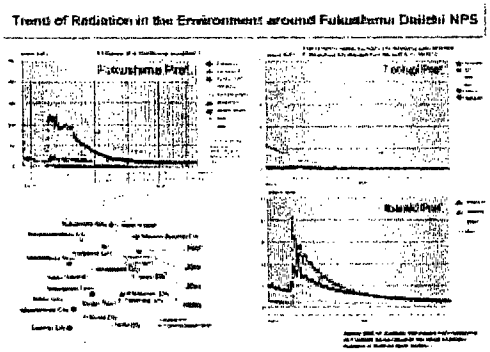


With regard to the accident at Fukushima Daiichi Nuclear Power Station due to the Tohoku-Chihou-Taiheiyo-Oki Earthquake occurred on Friday, March 11th, 2011, we are currently making our utmost effort to bring the situation under control. This announcement is to notify the roadmap that we have put together towards restoration from the accident. Click for more.

- Plant status update: Click for more

W/123

JAIF Status Update



Trends of radiation monitoring, April 17, 2011

Update 100, April 18, 2011
A PDF document provides a simple summary of each of the units at Fukushima nuclear power plants. This is a multi-page document that also provides a chronology of events and a map that details the status of each of the Japanese nuclear units.

Earthquake Update 56.

Quick Links...

- NPJ Website
- NPJ Japan Updates
- Cost-free Subscription (to NPJ)
- JAIF
- TEPCO
- NISA
- U.S. NRC Actions on Japan

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Beasley, Benjamin

From: Beasley, Benjamin
Sent: Wednesday, March 16, 2011 11:50 AM
To: Burnell, Scott
Subject: Re: NBC deadline question for NRC on seismic hazard estimates

We have found no inaccuracies yet. I am checking one last thing.

Benjamin Beasley
Sent from an NRC Blackberry.

From: Burnell, Scott
To: Beasley, Benjamin
Sent: Wed Mar 16 11:48:53 2011
Subject: RE: NBC deadline question for NRC on seismic hazard estimates

Ben;

Just another nudge – I really need a staff response to forward to other OPAs – can't leave OPS CTR. Thanks.

Scott

From: Beasley, Benjamin
Sent: Wednesday, March 16, 2011 11:19 AM
To: Laur, Steven; Burnell, Scott; Manoly, Kamal; Hiland, Patrick; Skeen, David; Stutzke, Martin
Cc: Ferrante, Fernando; Chokshi, Nilesh; Coyne, Kevin; Coe, Doug
Subject: RE: NBC deadline question for NRC on seismic hazard estimates

Of course. Scott Burnell has been involved and we are only talking to him, not any reporters.

Ben

From: Laur, Steven
Sent: Wednesday, March 16, 2011 10:54 AM
To: Burnell, Scott; Beasley, Benjamin; Manoly, Kamal; Hiland, Patrick; Skeen, David; Stutzke, Martin
Cc: Ferrante, Fernando; Chokshi, Nilesh; Coyne, Kevin; Coe, Doug
Subject: RE: NBC deadline question for NRC on seismic hazard estimates

I have not looked at the article, but would recommend you get OPA involved at once (and not talk to this reporter without OPA involvement).

Note the timing of this article about seismic risk vis-à-vis the Japanese experience at Fukushima Daiichi and also our Ops Center e-mail saying we will NOT provide information on the Japanese event. While GI-199 is not the Japanese event, we should tread carefully!

Steven A. Laur
NRR Division of Risk Assessment
OWFN 10-C15
(301) 415-2889
steven.laur@nrc.gov

W/124

From: Burnell, Scott
Sent: Wednesday, March 16, 2011 9:59 AM
To: Beasley, Benjamin; Manoly, Kamal; Hiland, Patrick; Skeen, David; Stutzke, Martin
Cc: Ferrante, Fernando; Laur, Steven; Chokshi, Nilesh; Coyne, Kevin; Coe, Doug
Subject: RE: NBC deadline question for NRC on seismic hazard estimates

I'm waiting for a technical critique – may hand this off to other OPA once I see it. Thx.

From: Beasley, Benjamin
Sent: Wednesday, March 16, 2011 9:58 AM
To: Burnell, Scott; Manoly, Kamal; Hiland, Patrick; Skeen, David; Stutzke, Martin
Cc: Ferrante, Fernando; Laur, Steven; Chokshi, Nilesh; Coyne, Kevin; Coe, Doug
Subject: RE: NBC deadline question for NRC on seismic hazard estimates

We are checking the numbers. If you are working on a review on checking it, please let me know. I will coordinate our efforts to prevent duplication and assure we cover all the bases.

Ben

From: Burnell, Scott
Sent: Wednesday, March 16, 2011 9:55 AM
To: Manoly, Kamal; Hiland, Patrick; Skeen, David; Stutzke, Martin; Beasley, Benjamin
Cc: Ferrante, Fernando; Laur, Steven; Chokshi, Nilesh
Subject: RE: NBC deadline question for NRC on seismic hazard estimates

Very probably so – but we can only provide factual corrections. We need to point to specific documents whenever possible to avoid a "that's just your opinion" sort of response.

From: Manoly, Kamal
Sent: Wednesday, March 16, 2011 9:53 AM
To: Hiland, Patrick; Skeen, David; Stutzke, Martin; Beasley, Benjamin; Burnell, Scott
Cc: Ferrante, Fernando; Laur, Steven; Chokshi, Nilesh
Subject: FW: NBC deadline question for NRC on seismic hazard estimates

It seems that he spun the information provided to support a biased point of view he already has and to make the story sensational!

From: Bill Dedman [mailto:Bill.Dedman@msnbc.com]
Sent: Wednesday, March 16, 2011 6:44 AM
To: Manoly, Kamal; Sheron, Brian; Hiland, Patrick; OPA Resource
Subject: RE: NBC deadline question for NRC on seismic hazard estimates

This story is online now. If you see any error, please let me know right away.

Thanks,

Bill

http://www.msnbc.msn.com/id/42103936/ns/world_news-asiapacific/

From: Bill Dedman
Sent: Tuesday, March 15, 2011 9:06 AM
To: 'Kamal.Manoly@nrc.gov'; 'brian.sheron@nrc.gov'; 'patrick.hiland@nrc.gov'; 'OPA.Resource@nrc.gov'
Subject: NBC deadline question for NRC on seismic hazard estimates

Good morning,

My name is Bill Dedman. I'm a reporter for NBC News and msnbc.com, writing an article today about:

SAFETY/RISK ASSESSMENT RESULTS FOR GENERIC ISSUE 199, "IMPLICATIONS OF UPDATED PROBABILISTIC SEISMIC HAZARD ESTIMATES IN CENTRAL AND EASTERN UNITED STATES ON EXISTING PLANTS"

I reached out to NRC Public Affairs yesterday but have not heard back, and my deadline is end-of-day today. I'm hoping to get on the phone today with someone from NRC to make sure I'm conveying this information accurately to the public. If nothing else, I'm hoping one of the technical people can help clarify the points below. My telephone number is 203-451-9995.

I've read Director Brian Sheron's memo of Sept. 2, 2010, to Mr. Patrick Hiland; the safety/risk assessment of August 2010; its appendices A through D; NRC Information Notice 2010-18; and the fact sheet from public affairs from November 2010.

I have these questions:

1. I'd like to make sure that I accurately place in layman's terms the seismic hazard estimates. I need to make sure that I'm understanding the nomenclature for expressing the seismic core-damage frequencies. 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?

2. These 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.?

3. The 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."

4. What is the timetable now for consideration of any regulatory changes from this research?

Thank you for your help.

Regards,

Bill Dedman

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Beasley, Benjamin

From: Beasley, Benjamin
Sent: Wednesday, March 16, 2011 11:54 AM
To: Burnell, Scott
Subject: RE: NBC deadline question for NRC on seismic hazard estimates

Can you give me a quick call? 251-7676

From: Burnell, Scott
Sent: Wednesday, March 16, 2011 11:49 AM
To: Beasley, Benjamin
Subject: RE: NBC deadline question for NRC on seismic hazard estimates
Importance: High

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Steven A. Laur
NRR Division of Risk Assessment
OWFN 10-C15
(301) 415-2889
steven.laur@nrc.gov

From: Burnell, Scott
Sent: Wednesday, March 16, 2011 9:59 AM
To: Beasley, Benjamin; Manoly, Kamal; Hiland, Patrick; Skeen, David; Stutzke, Martin

W/25

Good morning,

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4. What is the timetable now for consideration of any regulatory changes from this research?

Thank you for your help.

Regards,

Bill Dedman

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Beasley, Benjamin

From: Beasley, Benjamin
Sent: Wednesday, March 16, 2011 12:49 PM
To: Wegner, Mary
Subject: RE: On Information About the Japanese Earthquake

Mary,

When communicating with John Kappenman or anyone else outside the agency, please make sure that they understand that you are speaking on your own and are not representing the NRC.

Thanks.

Ben

From: Wegner, Mary
Sent: Wednesday, March 16, 2011 12:34 PM
To: Beasley, Benjamin
Subject: On Information About the Japanese Earthquake

FYI: I am providing information to the Clearing House personnel and to you directly. I have posted to my Internet page on the S: drive which is accessible to NRC personnel. I have responded to one member of the public (John Kappenman) with info from NISA and TEPCO taken from their public sites. (John is an important source of info to me so I respond to him.)

I have NO expertise in seismic matters, I have received no requests for such information, and I could not answer them if I did. I respond to request for information about the plants with information from NISA and TEPCO.

That having been said, I think NRC policy concerning the events in Japan is WRONG! We should inform the public. As we say in our "Values" statements:

Service
...to the public, and others who are affected by our work
...responsive, accountable, proactive

Openness
...in communications and decision-making
...transparent, forthright

In fact, we are required under law to. "encourage the dissemination of scientific, technical, and practical information relating to energy so as to enlarge the fund of such information and to provide that free interchange of ideas and criticism which is essential to scientific and industrial progress and public understanding." *From Energy Reorganization Act of 1974 (P.L. 93-438)*

The Canadian Nuclear Safety Commission, the Spanish Nuclear Safety Council, the French Nuclear Safety Authority, the Indian Atomic Energy Review Board, the Swedish Stralsakerhets mydmdigheten, as well as Eletronucleaire (Brazil), Rosatom (Russia), Bruce Power (Canada), and others have all published information for the public.

W/126

Beasley, Benjamin

From: Beasley, Benjamin
Sent: Wednesday, March 16, 2011 2:05 PM
To: Burnell, Scott
Subject: FW: Article on GI-199

Scott,

Shall I leave this for you to handle?

Ben

From: KEITHLINE, Kimberly [mailto:kak@nei.org]
Sent: Wednesday, March 16, 2011 1:47 PM
To: Beasley, Benjamin
Subject: RE: Article on GI-199

Ben,

Has NRC provided any comments back to MSNBC?

Kimberly

nuclear

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Sent through mail.messaging.microsoft.com

Beasley, Benjamin

From: Beasley, Benjamin
Sent: Wednesday, March 16, 2011 12:03 PM
To: Kauffman, John
Subject: Am I right?

Article:
"One problem is a lack of data about the nuclear reactors themselves. The NRC task force said the agency has detailed data on what it calls plant fragility — the probability that the expected earthquake would damage the reactor's core — for only one-third of the nation's nuclear plants. That's because only the plants that had been thought to be in areas of higher seismic risk had done detailed studies. For the rest, the scientists had to estimate from other information submitted by plant operators."

Correction:
The NRC task force had more information for some plants than for others. The difference is based on the type of analysis the plant operator chose to use. Two thirds of the plant operators used a bounding analysis while the other third performed a more detailed analysis. The choice of analysis method was not connected to an area of higher seismic risk.

W/127

Bano, Mahmooda

From: Scott, Michael
Sent: Monday, April 18, 2011 8:24 AM
To: Gibson, Kathy
Subject: RE: Commission Meeting on Japanese Events

Any idea to when?

From: Gibson, Kathy
Sent: Sunday, April 17, 2011 6:26 PM
To: Scott, Michael
Subject: Re: Commission Meeting on Japanese Events

Postponed

From: Scott, Michael
To: Gibson, Kathy
Sent: Sun Apr 17 17:28:33 2011
Subject: RE: Commission Meeting on Japanese Events

Whatever happened with this? Past Apr 14 so guess did not happen.

From: Gibson, Kathy
Sent: Tuesday, March 22, 2011 8:07 AM
To: Sheron, Brian; Uhle, Jennifer; Scott, Michael; Bush-Goddard, Stephanie
Cc: Elkins, Scott
Subject: Re: Commission Meeting on Japanese Events

Yes we should lead (with NSIR/Ops Center support) and we can be ready. As soon as you tell me to launch, I will put a team together to work it.

From: Sheron, Brian
To: Uhle, Jennifer; Gibson, Kathy; Scott, Michael; Bush-Goddard, Stephanie
Sent: Tue Mar 22 07:56:32 2011
Subject: FW: Commission Meeting on Japanese Events

See below. Can we be ready to do this by 4/14? Should we be the lead?

From: Bowman, Gregory
Sent: Tuesday, March 22, 2011 7:51 AM
To: Sheron, Brian; Uhle, Jennifer; Gibson, Kathy; Scott, Michael
Cc: Bush-Goddard, Stephanie; Rini, Brett; Dion, Jeanne; Armstrong, Kenneth
Subject: Commission Meeting on Japanese Events
Importance: High

I just learned that we're working towards scheduling a near-term meeting on the events in Japan, with a focus on radiological consequences and potential health effects. The current thinking is that RES would have the lead for this meeting, which will most likely take place on April 14.

The meeting would involve discussion of (1) status of the event (maybe led by NRR), (2) radiological impacts, and (3) radiological significance. The external panel might involve other Federal agencies (e.g., EPA, DOE).

W-128

HPS, industry, and/or a representative from one of the labs, although it could end up being a challenge to get participation given the timeframe. We would just need to give SECY suggestions and let them take care of the invitations.

Alan Frazier put together the attached draft scheduling note, but it will need to be revised. My understanding is the SECY will likely need a revised scheduling note back today to get to the Commission. Please let me know as soon as you can if you think the lead for this meeting should be assigned to a different office (if that's the case, we'll need to circle back with Mike).

Greg

From: Frazier, Alan
Sent: Monday, March 21, 2011 4:47 PM
To: Bowman, Gregory
Cc: Brock, Kathryn; Andersen, James; Wittick, Brian; Merzke, Daniel
Subject: RE: ACTION: Draft Scheduling Note for New Commission Meeting

Greg,

FSME tells me that last week RES agreed to take the lead in any discussion of rad consequences or health affects if those topics had come up during today's Commission meeting. The Commission would now like to have a Commission meeting in April focused on rad consequences and health effects.

Could you please confirm with RES tomorrow that they should have the lead for the April Commission meeting? Note that it was Jeanne Dion that agreed RES should have the lead last week (see attached email) but I am not aware of any front office interaction on this.

Alan

From: Deegan, George
Sent: Monday, March 21, 2011 4:29 PM
To: Frazier, Alan
Cc: Brock, Kathryn; Andersen, James; Wittick, Brian; Weber, Michael; Miller, Charles; Moore, Scott; Merzke, Daniel
Subject: RE: ACTION: Draft Scheduling Note for New Commission Meeting

Alan- Thanks for forwarding Jim Andersen's email.

When Allen Howe's Working Group was assembled last week to construct an outline for today's Commission briefing, the rad consequences/health effects issue was identified as originally marked as an FSME potential topic, but we later determined that RES would be better to take lead (with SOARCA etc.). I'd think they'd be the best ones to lead any new Commission briefing in April on this topic. I'll forward you that email chain separately.

From: Frazier, Alan
Sent: Monday, March 21, 2011 3:42 PM
To: Deegan, George
Cc: Brock, Kathryn; Andersen, James; Wittick, Brian; Weber, Michael; Miller, Charles; Moore, Scott; Merzke, Daniel
Subject: ACTION: Draft Scheduling Note for New Commission Meeting

George,

Please take a look at Jim's note below from today's agenda planning meeting which was held immediately after the Commission meeting.

Note in particular the highlighted **new Commission meeting in April on the Japan event with additional focus on radiological consequence / health effects** (probably around 4/14). FSME will have the lead for this new Commission meeting. Additionally, I got some feedback from Jim that you should consider having the following elements in the scheduling note.

- Status of event
- Radiological Impacts
- Radiological significance
- External panel

ACTION: In cooperation with NRR and NSIR (and any other offices you feel should be involved) please take the lead for developing a scheduling note. I have attached a initial draft to help get you started.

I do not know when this action will be due but I wanted to give you a head-start. We are still waiting for SECY's official summary of the meeting, which usually contains due dates for the draft scheduling notes.

Please let me know if you have any questions.

Regards,

Alan L. Frazier
Executive Technical Assistant
Office of the Executive Director for Operations
U.S. Nuclear Regulatory Commission
301-415-1763

From: Andersen, James
Sent: Monday, March 21, 2011 1:35 PM
To: EDO_TBPM Distribution
Cc: Muessle, Mary; Weber, Michael; Virgilio, Martin; Ash, Darren; Landau, Mindy
Subject: Agenda Planning Meeting

ETAs,

The Commission held an Agenda Planning Meeting this morning. SECY will provide the formal summary, but I wanted to let you know a couple things as quickly as possible:

- The 10CFR50.46(a) Commission meeting was postponed to a later unspecified date, the Commission will continue to review the paper (Bill Ruland was informed)

- The SMR Commission meeting on 3/29 is still on (Mike Mayfield was informed)

- The Source Security Commission meeting on 4/19 is still on (Josie Piccone was informed)

- The ITAAC Commission meeting was postponed to a later unspecified date, the Commission will continue to review the paper (Mike Mayfield was informed)

- The EEO/Human Capital Commission meeting was moved to June 2 (**Kris – please advise HR and SBCR**)

- The Cumulative Effectives of Regulation Commission meeting was postponed to a later unspecified date (Tom Blount was informed)

- The AARM Commission meeting on 5/27 is still on **(Brian please advice NRR)**

- The Emergency Planning Final Rule Commission meeting was moved up to May 12 (left Bob Kahler a message)

- The ACRS meeting on 6/6 is still on

- The International Commission meeting was postponed to a later unspecified date

Several new meetings were added:

- 30, 60, and 90 day status meetings regarding the Near-Term NRC Review Effort (task group?); probably around 5/3, 6/16, 7/18 **(Jim A lead for scheduling note)**

- Status meeting on the Japanese event with additional focus on radiological consequence / health effects; probably around 4/14 **(Brian lead for scheduling note)**

- Status meeting on the Japanese event with additional focus on station blackout; probably around 4/28 **(Brian lead for scheduling note)**

- Stakeholder meeting on the staff's 90 day status report; probably around 7/25 **(Jim A lead for scheduling note)**

A

Freeman, Eric

From: Freeman, Eric
Sent: Wednesday, March 16, 2011 10:37 AM
To: Aguilar, Santiago
Subject: Need more of this

We really need to see more of this sort of commentary online...

As a result of the events in Japan, some have already begun with grand gestures to call on our lawmakers to rule out new nuclear power development. We need to reflect on the simple truth that we do not have a nonfossil alternative that can make up the substantial power needs of the world other than nuclear power.
Sure, we can use solar, wind, hydroelectric, biomass and the like, but collectively, on a future very good day, using every practical alternative resource to expand these alternative energy sources, they will only amount to a grand sum of 20% of our energy needs. To keep global warming in check, and faced with the concept of rolling blackouts or steady, clean electricity, the gap can and must be made up with modern nuclear power, which is passively safe with the newest design.
The pundits go on to ask, "What about the waste?" I answer this by asking, did you ever wonder why our French colleagues have 40 years of mostly nuclear power and no waste problems?
Like most nations, they recycle their used fuel, since 95% of the fuel can be recycled back into the reactor and used again, making nuclear power the most "green" energy source out there. Burying the waste, as we do in the United States, is completely wasteful, and other nations, including Japan, recycle all of their used fuel.
We do need to take pause, as the events in Japan are certainly immense, and we need to collectively ponder ways to improve at all levels. However, I believe we need to be smart and carry on the mission of nuclear power for a sustainable future, learning from our mistakes. Likewise, I don't stop driving my gasoline powered automobile when I hear about an oil refinery accident. Let us be smart, but let us also be sensible and realistic.
The opinions expressed in this commentary are solely those of Glenn Sjoden.

W/129

From: Leeds, Eric NRR
To: Virgilio, Martin OEDO
Cc: Borchardt, Bill; Weber, Michael; Boger, Bruce; Grobe, Jack
Subject: ACTION: NRR taking the lead for commission meeting
Date: Wednesday, March 16, 2011 9:56:24 AM

Marty –

NRR was asked to take the lead for this Commission meeting. In addition, we're also taking the following actions:

1. Establishing a media guru to help facilitate Q&As (beyond the current Share-point site) – Bob Nelson will lead the effort.
2. We've started work on a generic communication to NRC licensees based on the Japanese events. We're following the INPO work.

FYI.

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

From: Virgilio, Martin OEDO
Sent: Wednesday, March 16, 2011 3:29 AM
To: Borchardt, Bill
Cc: Weber, Michael; Leeds, Eric; Dorman, Dan; Miller, Chris; Lewis, Robert; Doane, Margaret; Powell, Amy; Wiggins, Jim; Casto, Chuck; Brenner, Eliot; Muessle, Mary; Andersen, James; Wittick, Brian; Grobe, Jack; Evans, Michele; Ash, Darren NMSS; NSIR; OIP; FSME; CA; OPA; RES;
Subject: FW: commission meeting outline.docx

Bill

Last night the Chairman briefed the Commissioners on the status of the events in Japan and NRC's response. During that meeting the Commissioners suggested NRC hold a Commission meeting either this week or next on the events and the Chairman agreed to the meeting.

Attached is a draft outline for that meeting. We believe this outline could also be used as a tool for organizing a presentation for Congressional Briefings and interactions with the media. We acknowledge the ambitious nature of the outline and the fact that we might not be ready to speak to each of the issues if the Commission meeting is held this week.

Marty

W/130

Bano, Mahmooda

From: Scott, Michael
Sent: Wednesday, April 13, 2011 1:21 PM
To: Hasselberg, Rick
Cc: Boyce, Tom (RES); Taylor, Robert; Blamey, Alan; Giessner, John
Subject: FW: Operations Center Lessons Learned - Japanese Earthquake/Tsunami Event

Rick:

In general, I think the RST did a very good job in working with the Japan team while I was there. The exception is that turnovers were often ineffective. We would get a commitment from the RST on one shift, and the next shift would have no idea about the commitment. This happened often enough and with enough of a variety of watchstanders that I consider it a generic opportunity for improvement.

Mike

From: Boyce, Tom (RES)
Sent: Wednesday, April 13, 2011 1:05 PM
To: Scott, Michael
Subject: FW: Operations Center Lessons Learned - Japanese Earthquake/Tsunami Event

Mike,

As we discussed today, below is what I received on how to submit lessons learned. This email came from the OPS Center.

Upon review, I'm not sure this is the best path to get feedback from the Japan site team. I do think the feedback of the site team would be quite valuable, however.

Tom

From: OST02 HOC
Sent: Sunday, April 10, 2011 4:26 PM
To: Abrams, Charlotte; Abu-Eid, Boby; Adams, John; Afshar-Tous, Mugeh; Ahn, Hosung; Alemu, Bezakulu; Algama, Don; Alter, Peter; Anderson, Brian; Anderson, James; Arndt, Steven; Arribas-Colon, Maria; Ashkeboussi, Nima; Athey, George; Baker, Stephen; Ballam, Nick; Barnhurst, Daniel; Barr, Cynthia; Barss, Dan; Bazian, Samuel; Benner, Eric; Bensi, Michelle; Bergman, Thomas; Berry, Rollie; Bhachu, Ujagar; Bloom, Steven; Blount, Tom; Boger, Bruce; Bonnette, Cassandra; Borchardt, Bill; Bowers, Anthony; Bowman, Gregory; Boyce, Tom (RES); Brandon, Lou; Brandt, Philip; Brenner, Eliot; Brock, Kathryn; Brown, Cris; Brown, David; Brown, Eva; Brown, Frederick; Brown, Michael; Bukharin, Oleg; Burnell, Scott; Bush-Goddard, Stephanie; Campbell, Stephen; Camper, Larry; Carlson, Donald; Carpenter, Cynthia; Carter, Mary; Case, Michael; Casto, Greg; Cecere, Bethany; Cervera, Margaret; Chazell, Russell; Chen, Yen-Ju; Cheng, May; Cheok, Michael; Chokshi, Nilesh; Chowdhury, Prosanta; Chung, Donald; Circle, Jeff; Clement, Richard; Clinton, Rebecca; Coe, Doug; Coggins, Angela; Collins, Frank; Cool, Donald; Correia, Richard; Corson, James; Costa, Arlon; Couret, Ivonne; Craffey, Ryan; Crutchley, Mary Glenn; Cruz, Zahira; Cuadrado, Leira; Dacus, Eugene; DeCicco, Joseph; Decker, David; Dembek, Stephen; Devlin, Stephanie; Dimmick, Lisa; Doane, Margaret; Dorman, Dan; Dorsey, Cynthia; Dozier, Jerry; Drake, Margaret; Droggitis, Spiros; Dube, Donald; Dudes, Laura; Eads, Johnny; Easson, Stuart; Emche, Danielle; English, Lance; Erlanger, Craig; Esmaili, Hossein; Evans, Michele; Faria-Ocasio, Carolyn; Figueroa, Roberto; Fiske, Jonathan; Flanders, Scott; Flannery, Cindy; Floyd, Daphene; Foggie, Kirk; Foster, Jack; Fragoyannis, Nancy; Franovich, Rani; Frazier, Alan; Freshman, Steve; Fuller, Edward; Galletta, Thomas; Gambone, Kimberly; Gardocki, Stanley; Gartman, Michael; Gibson, Kathy; Giitter, Joseph; Gilmer, James; Glenn, Nichole; Gordon, Dennis; Gott, William; Grant, Jeffery; Gray, Anita; Gray, Kathy; Greenwood, Carol; Grimes, Kelly; Grobe, Jack; Gross, Allen; Gulla, Gerald; Hackett, Edwin; Hale, Jerry; Hardesty, Duane; Hardin, Kimberly; Hardin, Leroy; Harrington, Holly; Harris, Tim; Harrison, Donnie; Hart, Ken; Hart, Michelle; Harvey, Brad; Hasselberg, Rick; Hayden, Elizabeth; Helton, Donald; Henderson, Karen; Hiland, Patrick; Hipschman, Thomas; Holahan, Patricia; Holahan, Vincent; Holian, Brian; Honolich, Joe; HOO Hoc; Horn, Brian; Howard, Arlette;

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Howard, Tabitha; Howe, Allen; Huffert, Anthony; Hurd, Sapna; Huyck, Doug; Imboden, Andy; Isom, James; Jackson, Karen; Jacobson, Jeffrey; Jervey, Richard; Jessie, Janelle; Johnson, Don; Johnson, Michael; Jolicoeur, John; Jones, Andrea; Jones, Cynthia; Jones, Henry; Kahler, Carolyn; Kammerer, Annie; Karas, Rebecca; Kauffman, John; Khan, Omar; Kolb, Timothy; Kotzalas, Margie; Kowalczik, Jeffrey; Kratchman, Jessica; Kugler, Andrew; Lamb, Christopher; Lane, John; Larson, Emily; Laur, Steven; LaVie, Steve; Lewis, Robert; Li, Yong; Lichatz, Taylor; Lising, Jason; Lombard, Mark; Lovell, Louise; Lubinski, John; Lui, Christiana; Lukes, Kim; Lynch, Jeffery; Ma, John; Mamish, Nader; Manahan, Michelle; Marksberry, Don; Marshall, Jane; Masao, Nagai; Maupin, Cardelia; Mayros, Lauren; Mazaika, Michael; McConnell, Keith; McCoppin, Michael; McDermott, Brian; McGinty, Tim; McGovern, Denise; McIntyre, David; McMurtray, Anthony; Merritt, Christina; Meyer, Karen; Layton, Michael; Miller, Charles; Miller, Chris; Milligan, Patricia; Miranda, Samuel; Mohseni, Aby; Moore, Scott; Morlang, Gary; Morris, Scott; Mroz (Sahm), Sara; Munson, Clifford; Murray, Charles; Musico, Bruce; Nerret, Amanda; Nguyen, Caroline; Norris, Michael; Norton, Charles; Nosek, Andrew; Opara, Stella; Ordaz, Vonna; Orr, Mark; Owens, Janice; Padovan, Mark; Parillo, John; Patel, Jay; Patel, Pravin; Patrick, Mark; Perin, Vanice; Pope, Tia; Powell, Amy; Purdy, Gary; Quinlan, Kevin; Raddatz, Michael; Ragland, Robert; Ralph, Melissa; Ramsey, Jack; Reed, Elizabeth; Reed, Sara; Reed, Wendy; Reeves, Rosemary; Reis, Terrence; Resner, Mark; Riley (OCA), Timothy; Riner, Kelly; Rini, Brett; Roach, Edward; Robinson, Edward; Rodriguez-Luccioni, Hector; Roggenbrodt, William; Ropon, Kimberly; Rosales-Cooper, Cindy; Rosenberg, Stacey; Ross-Lee, MaryJane; Roundtree, Amy; Ruland, William; Russell, Tonya; Ryan, Michelle; Salay, Michael; Salter, Susan; Salus, Amy; Sanfilippo, Nathan; Santos, Daniel; Scarbrough, Thomas; Schaperow, Jason; Schmidt, Duane; Schmidt, Rebecca; Schoenebeck, Greg; Schrader, Eric; Schwartzman, Jennifer; Seber, Dogan; See, Kenneth; Shane, Raeann; Shea, James; Shepherd, Jill; Sheron, Brian; Skarda, Raymond; Skeen, David; Sloan, Scott; Smiroldo, Elizabeth; Smith, Brooke; Smith, Stacy; Smith, Theodore; Solorio, Dave; Stahl, Eric; Stang, Annette; Stark, Johnathan; Steger (Tucci), Christine; Stieve, Alice; Stone, Rebecca; Stransky, Robert; Sturz, Fritz; Sullivan, Randy; Summers, Robert; Sun, Casper; Susco, Jeremy; Takacs, Michael; Tappert, John; Tegeler, Bret; Temple, Jeffrey; Thaggard, Mark; Thomas, Eric; Thorp, John; Tiruneh, Nebiyu; Tobin, Jennifer; Trefethen, Jean; Tschiltz, Michael; Turtil, Richard; Uhle, Jennifer; Valencia, Sandra; Vaughn, James; Velazquez-Lozada, Alexander; Vick, Lawrence; Virgilio, Martin; Virgilio, Rosetta; Ward, Leonard; Ward, William; Wastler, Sandra; Watson, Bruce; Webber, Robert; Weber, Michael; White, Bernard; Wiggins, Jim; Williams, Donna; Williams, Joseph; Williams, Tamera; Williamson, Linda; Willis, Dori; Wimbush, Andrea; Wittick, Brian; Wray, John; Wright, Lisa (Gibney); Wright, Ned; Wunder, George; Young, Francis; Zimmerman, Jacob; Zimmerman, Roy

Subject: Operations Center Lessons Learned - Japanese Earthquake/Tsunami Event

Good Afternoon,

Please provide any lessons learned regarding your experiences and potential improvements from your time in the Operations Center during the Japanese Earthquake/Tsunami Event response in the Operations Center by COB, Friday, April 22, 2011.

There are several ways to provide your lessons learned:

1. Send an e-mail to your team response program manager:
   a. Executive Team (ET) and Executive Support Team (EST) positions: Jeff Grant (Jeffery.Grant@nrc.gov)
   b. Reactor Safety Team (RST) positions: Rick Hasselberg/Peter Alter (Rick.Hasselberg@nrc.gov; Peter.Alter@nrc.gov)
   c. Protective Measures Team (PMT) positions: Lou Brandon (Lou.Brandon@nrc.gov)
   d. Liaison Teams: Jeff Temple (Jeffrey.Temple@nrc.gov)

2. Within WebEOC
   a. In Operations Center – click on icon on desktop
   b. From office or via Citrix, open Internet Explorer and type in the following IP address in the URL: 148.184.213.135
   c. Once logged in, on the main control panel under Menus, select HOC Menu. Then click on the board entitled "Comments and Issues." Then click "New Entry" button (upper right corner). Type in your comments or Issues and/or your Suggestions for improvement in the appropriate boxes. Click Save when finished.

Thank You,
OST02/01

Satorius, Mark

From: Satorius, Mark
Sent: Wednesday, March 16, 2011 2:14 PM
To: Pederson, Cynthia
Subject: Fw: Planning for upcoming, short notice Commission meeting
Attachments: Scheduling NoteMar2011_JapaneseEvent agh 3-16-2011.docx

Mark Satorius

From: Ruland, William
To: Williams, Donna; Uhle, Jennifer; Sheron, Brian; Moore, Scott; Miller, Charles; Brenner, Eliot; Haney, Catherine; Dorman, Dan; Wiggins, Jim; Evans, Michele; Doane, Margaret; Mamish, Nader
Cc: Johnson, Michael; Holahan, Gary; Leeds, Eric; Grobe, Jack; Howe, Allen
Sent: Wed Mar 16 13:18:34 2011
Subject: Planning for upcoming, short notice Commission meeting

Folks,

Attached find a early draft of a scheduling note for a Commission meeting that may be held as early as this coming Monday, March 21st. NRR has been assigned as the lead to pull the meeting together. As you could imagine, this will take some effort. To help with coordination, please provide me a contact so that we can draw on your expertise and help to make this happen. Alan Howe, currently deputy director of DORL, has the lead to pull this together.

I know you have many questions. I'd ask for your patience as we try to get this done. I'll keep you updated through the contact that you provide to us.

Thank you very much.

Bill Ruland

W/132

Draft: 3/16/11

SCHEDULING NOTE

Title: **BRIEFING ON JAPANESE EVENT and US RESPONSE (Public?)**

Purpose: To provide the Commission a status on the recent event in Japan, and to provide an overview of staff actions to date, early planned actions

Scheduled: **March XX, 2011**
9:00 am

Duration: Approx. 2 hours

Location: Commissioners' Conference Room OWFN

Participants:	**Presentation**
NRC Staff Panel	**50 mins.***
Bill Borchardt, Executive Director for Operations Topic: Overview of Japanese Event and U.S. response	15 mins.*
Mike Weber, Deputy Executive Director Materials, Waste, Research, State, Tribal and Compliance Programs Topic: Potential consequences; what will be seen in U.S.	10 mins.*
Marty Virgilio, Deputy Executive Director for Reactor and Preparedness Programs Topic: Situation assessment for U.S. reactors and applicants	10 mins.*
Elliot Brenner, OPA Topic: Communication Challenges	5 mins.*
Eric Leeds, Director, NRR Topic: Path forward;Near term and longer term	10 mins.*
Commission Q & A	**30 mins.**
Discussion – Wrap-up	**5 mins.**
Break	**10 mins.**

Closed session

Strategy and agenda planning

Documents:
Staff background material due to SECY: March __, 2011.

Slides due to SECY: March __, 2011.

NRC NEWS

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

No. 11-050 March 16, 2011

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

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

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

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

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

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

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News releases are available through a free *listserv* subscription at the following Web address: http://www.nrc.gov/public-involve/listserver.html. The NRC homepage at www.nrc.gov also offers a SUBSCRIBE link. E-mail notifications are sent to subscribers when news releases are posted to NRC's website.

W/133

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

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

Maximum Dose Values (rem) - Close-In

Dist from release miles (kilometers)	0.5 (0.8)	1. (1.61)	1.5 (2.41)	2. (3.22)	3. (4.83)	5. (8.05)	7. (11.27)	10. (16.09)
Total EDE	5.4E+03	2.0E+03	1.2E+03	8.2E+02	4.8E+02	2.4E+02	1.6E+02	9.5E+01
Thyroid CDE	2.8E+04	1.1E+04	6.2E+03	4.3E+03	2.5E+03	1.3E+03	8.4E+02	5.1E+02
Inhalation CEDE	3.7E+03	1.4E+03	8.0E+02	5.6E+02	3.3E+02	1.7E+02	1.1E+02	6.7E+01
Cloudshine	1.9E+01	9.3E+00	5.8E+00	4.1E+00	2.5E+00	1.4E+00	9.7E-01	6.2E-01
4-day Groundshine	1.7E+03	6.5E+02	3.8E+02	2.6E+02	1.5E+02	7.3E+01	4.6E+01	2.8E+01
Inter Phase 1st Yr	2.4E+04	9.4E+03	5.4E+03	3.8E+03	2.2E+03	1.1E+03	6.6E+02	3.9E+02
Inter Phase 2nd Yr	1.1E+04	4.4E+03	2.6E+03	1.8E+03	1.0E+03	4.9E+02	3.1E+02	1.8E+02

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

Maximum Dose Values (rem) - To 50 mi

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

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

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

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

Maximum Dose Values (rem) - Close-In

Dist from release miles (kilometers)	0.5 (0.8)	1. (1.61)	1.5 (2.41)	2. (3.22)	3. (4.83)	5. (8.05)	7. (11.27)	10. (16.09)
Total EDE	5.4E+03	1.5E+03	6.7E+02	3.9E+02	1.8E+02	7.5E+01	4.0E+01	1.4E+01
Thyroid CDE	2.9E+04	7.9E+03	3.6E+03	2.1E+03	9.6E+02	4.0E+02	2.1E+02	7.5E+01
Inhalation CEDE	3.8E+03	1.0E+03	4.8E+02	2.8E+02	1.3E+02	5.4E+01	2.9E+01	1.0E+01
Cloudshine	2.2E+01	8.0E+00	3.9E+00	2.3E+00	8.0E-01	2.6E-01	2.1E-01	1.1E-01
4-day Groundshine	1.5E+03	4.1E+02	1.9E+02	1.1E+02	5.0E+01	2.1E+01	1.1E+01	4.3E+00
Inter Phase 1st Yr	2.6E+04	7.0E+03	3.2E+03	1.9E+03	8.5E+02	3.6E+02	1.9E+02	7.5E+01
Inter Phase 2nd Yr	1.3E+04	3.5E+03	1.6E+03	9.2E+02	4.2E+02	1.8E+02	9.5E+01	3.8E+01

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

Maximum Dose Values (rem) - To 50 mi

Dist from release miles (kilometers)	15 (24.1)	20 (32.2)	30 (48.3)	40 (64.4)	50 (80.5)
Total EDE	1.5E+01	1.3E+01	1.1E+01	1.0E+01	9.9E+00
Thyroid CDE	8.6E+01	7.0E+01	5.2E+01	4.9E+01	4.8E+01
Inhalation CEDE	1.1E+01	9.2E+00	7.7E+00	7.6E+00	7.3E+00
Cloudshine	1.2E-01	9.7E-02	7.3E-02	7.0E-02	6.6E-02
4-day Groundshine	4.1E+00	3.4E+00	2.8E+00	2.6E+00	2.5E+00
Inter Phase 1st Yr	7.1E+01	6.0E+01	4.7E+01	4.5E+01	4.3E+01
Inter Phase 2nd Yr	3.6E+01	3.0E+01	2.3E+01	2.2E+01	2.1E+01

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

T EDE - Total Effective Dose Equivalent
CDE - Committed Dose Equivalent
CEDE - Committed Effective Dose Equivalent
PAGs – Protective Action Guidelines
EPA – Environmental Protection Agency

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

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Inhalation CEDE	3.8E+03	1.0E+03	4.8E+02	2.8E+02	1.3E+02	5.4E+01	2.9E+01	1.0E+01
Cloudshine	2.2E+01	8.0E+00	3.9E+00	2.3E+00	8.0E-01	2.6E-01	2.1E-01	1.1E-01
4-day Groundshine	1.5E+03	4.1E+02	1.9E+02	1.1E+02	5.0E+01	2.1E+01	1.1E+01	4.3E+00
Inter Phase 1st Yr	2.6E+04	7.0E+03	3.2E+03	1.9E+03	8.5E+02	3.6E+02	1.9E+02	7.5E+01
Inter Phase 2nd Yr	1.3E+04	3.5E+03	1.6E+03	9.2E+02	4.2E+02	1.8E+02	9.5E+01	3.8E+01

Notes:
- Doses exceeding PAGs are underlined.
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Cloudshine	1.2E-01	9.7E-02	7.3E-02	7.0E-02	6.6E-02
4-day Groundshine	4.1E+00	3.4E+00	2.8E+00	2.6E+00	2.5E+00
Inter Phase 1st Yr	7.1E+01	6.0E+01	4.7E+01	4.5E+01	4.3E+01
Inter Phase 2nd Yr	3.6E+01	3.0E+01	2.3E+01	2.2E+01	2.1E+01

Notes:
- Doses exceeding PAGs are underlined.
- Early-Phase PAGs: TEDE - 1 rem, Thyroid (iodine) CDE - 5 rem
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- Total Acute Bone = Bone Inhalation + Cloudshine + Period Groundshine

T EDE - Total Effective Dose Equivalent
CDE - Committed Dose Equivalent
CEDE - Committed Effective Dose Equivalent
PAGs – Protective Action Guidelines
EPA – Environmental Protection Agency

Satorius, Mark

From: Collins, Elmo
Sent: Wednesday, March 16, 2011 1:38 PM
To: McCree, Victor; Satorius, Mark; Dean, Bill; Wiggins, Jim; Rudisail, Steven
Cc: Evans, Michele; Pederson, Cynthia; Lew, David; Wert, Leonard; Howell, Art; Croteau, Rick; Munday, Joel; Christensen, Harold; Jones, William
Subject: RE: Info: Possible request wrt KI

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From: McCree, Victor
Sent: Wednesday, March 16, 2011 1:35 PM
To: Collins, Elmo; Satorius, Mark; Dean, Bill; Wiggins, Jim; Rudisail, Steven
Cc: Evans, Michele; Pederson, Cynthia; Lew, David; Wert, Leonard; Howell, Art; Croteau, Rick; Munday, Joel; Christensen, Harold; Jones, William
Subject: RE: Info: Possible request wrt KI

Thanks Elmo – we had provided a "stash" of KI for Chuck to carry along with him, but he inadvertently left it in his office. I'll ask our guys (Steve – your action) to interface with yours and share as much as we can.

Vic

From: Collins, Elmo
Sent: Wednesday, March 16, 2011 2:33 PM
To: Satorius, Mark; Dean, Bill; McCree, Victor; Wiggins, Jim
Cc: Evans, Michele; Pederson, Cynthia; Lew, David; Wert, Leonard; Howell, Art
Subject: Info: Possible request wrt KI

All

Chuck Casto had a layover here in Texas on his way to Japan. In the hurriedness of getting on the plane, he found that he might not have been equipped as he needed to be, especially wrt KI. So, Region IV gave all our KI (53 packets) to Chuck for use in Japan, along with dosimeters and pocket dosimeters. So, Region IV finds itself without an immediate stash of KI for use if we had to send a site team.

Needless to say, given the high demand for KI, it is difficult to purchase on the open market.

Your staff will likely be contacted to see if we can beg, borrow, or steal enough packets of KI in order to equip a site team.

Thank you for your cooperation and generosity.

Elmo

W/134

Satorius, Mark

From: LIA04 Hoc
Sent: Wednesday, March 16, 2011 1:13 PM
To: OST05 Hoc; Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; Maier, Bill; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena; Collins, Elmo; Dean, Bill; Heck, Jared; McCree, Victor; Satorius, Mark; Flannery, Cindy; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michelle; Turtil, Richard; Virgilio, Rosetta
Cc: Piccone, Josephine; Jackson, Deborah; Noonan, Amanda
Subject: Please see attached Press Release. This is on our External NRC WEB site. (eom)
Attachments: PressReleaseNRCProvides PAG Rec11-050.pdf

NRC's Web site contains the attached, "NRC PROVIDES PROTECTIVE ACTION RECOMMENDATIONS BASED ON U.S. GUIDELINES" as just released. The referenced "computer calculations" are forthcoming; there appear to be technical difficulties wrt/ communicating the "attached" calculations

Richard Turtil
State Liaison – Liaison Team
Incident Response Center

W/135

NRC NEWS

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

No. 11-050 March 16, 2011

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

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

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

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

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

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

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News releases are available through a free *listserv* subscription at the following Web address: http://www.nrc.gov/public-involve/listserver.html. The NRC homepage at www.nrc.gov also offers a SUBSCRIBE link. E-mail notifications are sent to subscribers when news releases are posted to NRC's website.

From: Cullingford, Michael — NRR
To: Thomas, Eric
Cc: Boger, Bruce; Grobe, Jack
Subject: FW: TEPCO Earthquake Information Update as of March 14, 2300(JST) - Fukushima Daini Unit 1 in Cold Shutdown
Date: Wednesday, March 16, 2011 1:29:28 PM

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fyi

From: Aono Kenjiro [mailto:aono-kenjiro@jnes-usa.org]
Sent: Tuesday, March 15, 2011 5:08 PM
To: Emche, Danielle; Foggie, Kirk; Cullingford, Michael
Cc: 'Yamachika, Hidehiko'; 'Michael Chinworth'; Aono Kenji
Subject: RE: TEPCO Earthquake Information Update as of March 14, 2300(JST) - Fukushima Daini Unit 1 in Cold Shutdown

TEPCO announced at 4:07pm as follows.

Followings are current status of Fukushima-Daiichi/Daini NPS.
Highlits of this time are:
- Fukushima-Daiichi units 1,2 and 3 continues seawater injection as of 0:30 am on March 16.
- At Fukushima-Daini unit4 ,it was confirmed that the pressure at the outlet of the pumps of the Emergency Equipment Cooling Water System has been decreased, we stopped the Residual Heat Removal System (B) for the inspection at 8:05 pm

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From: Yamachika, Hidehiko [mailto:yamachika-hidehiko@jnes-usa.org]
Sent: Tuesday, March 15, 2011 12:50 PM
To: 'Emche, Danielle'; 'Foggie, Kirk'; 'Cullingford, Michael'
Cc: Aono, Kenjiro; Michael Chinworth
Subject: RE: TEPCO Earthquake Information Update as of March 14, 2300(JST) - Fukushima Daini Unit 1 in Cold Shutdown

Sorry, I failed to identify who said the below. But NHK carries press release of NISA or TEPCO.

From: Emche, Danielle [mailto:Danielle.Emche@nrc.gov]
Sent: Tuesday, March 15, 2011 12:43 PM
To: Yamachika, Hidehiko; Foggie, Kirk; Cullingford, Michael
Cc: Aono, Kenjiro; Michael Chinworth
Subject: RE: TEPCO Earthquake Information Update as of March 14, 2300(JST) - Fukushima Daini Unit 1 in Cold Shutdown

Thank you so much, out of curiousity, is this also confirmed by the government, i.e., NISA or other related agency?

From: Hidehiko Yamachika [mailto:yamachika-hidehiko@jnes-usa.org]
Sent: Tuesday, March 15, 2011 12:37 PM
To: Emche, Danielle; Foggie, Kirk; Cullingford, Michael
Cc: Aono, Kenjiro; Michael W. Chinworth
Subject: RE: TEPCO Earthquake Information Update as of March 14, 2300(JST) - Fukushima Daini Unit 1 in Cold Shutdown

W/136.

NHK said at 12:30pm in EDT.

Unit 4: There are 2 holes in the wall of the building. Investigation is still under way. Fuels had been moved from the reactor to the pool due to the periodic inspection.
Unit 5, 6: Temperature in the SF pools are gradually increasing, therefore the government and TEPCO are watching carefully.

From: Hidehiko Yamachika [mailto:yamachika-hidehiko@jnes-usa.org]
Sent: Monday, March 14, 2011 7:13 PM
To: 'Hidehiko Yamachika'; Emche, Danielle; Foggie, Kirk; Cullingford, Michael
Cc: Aono, Kenjiro; Michael W. Chinworth
Subject: RE: TEPCO Earthquake Information Update as of March 14, 2300(JST) - Fukushima Daini Unit 1 in Cold Shutdown

With regard to the mail below, NISA announced that there was explosion in the suppression room at 5:10 pm in Washington time, causing some damage to the suppression chamber.
The damage can be expected by the fact of pressure decrease at the suppression chamber from 3 atmospheric pressure in normal condition to 1 atmospheric pressure.

From: Hidehiko Yamachika [mailto:yamachika-hidehiko@jnes-usa.org]
Sent: Monday, March 14, 2011 6:49 PM
To: 'Hidehiko Yamachika'; Emche, Danielle; Foggie, Kirk; Cullingford, Michael
Cc: Aono, Kenjiro; Michael W. Chinworth
Subject: RE: TEPCO Earthquake Information Update as of March 14, 2300(JST) - Fukushima Daini Unit 1 in Cold Shutdown

A Chief Cabinet Secretary announced early in the morning of 15th March that defect was found in suppression poor.
*Unfortunately I have no idea which kind of defect is.

From: Hidehiko Yamachika [mailto:yamachika-hidehiko@jnes-usa.org]
Sent: Monday, March 14, 2011 4:54 PM
To: 'Hidehiko Yamachika'; Emche, Danielle; Foggie, Kirk; Cullingford, Michael
Cc: Aono, Kenjiro; Michael W. Chinworth
Subject: RE: TEPCO Earthquake Information Update as of March 14, 2300(JST) - Fukushima Daini Unit 1 in Cold Shutdown

A Chief Cabinet Secretary, Edano, announced at 4:40 pm in EDT that Government-TEPCO joint Head Quarter has been foamed to perform an integrated action.
HQ is placed in TEPCO HQ in Tokyo where Minister of METI and the CEO of TEPCO are to stay, exchange information and make decision.
A Chief Cabinet Secretary will play a role to instruct each government sectors and inform the public of their activities.

From: Hidehiko Yamachika [mailto:yamachika-hidehiko@jnes-usa.org]
Sent: Monday, March 14, 2011 3:31 PM
To: 'Hidehiko Yamachika'; Emche, Danielle; Foggie, Kirk; Cullingford, Michael
Cc: Aono, Kenjiro; Michael W. Chinworth
Subject: RE: TEPCO Earthquake Information Update as of March 14, 2300(JST) - Fukushima Daini Unit 1 in Cold Shutdown

TEPCO announced at 3:20pm in EDT that pressure in the reactor vessel is decreasing and injection of sea water is being carried out. However the gauge does not show that water level is coming up at

2:00pm in EDT.

From: Hidehiko Yamachika [mailto:yamachika-hidehiko@jnes-usa.org]
Sent: Monday, March 14, 2011 11:49 AM
To: Emche, Danielle; Foggie, Kirk; Cullingford, Michael – NRC
Cc: Aono, Kenjiro; Michael W. Chinworth
Subject: RE: TEPCO Earthquake Information Update as of March 14, 2300(JST) - Fukushima Daini Unit 1 in Cold Shutdown

TEPCO announced at 11:30 am in EDT that all of fuel became uncovered again at 10:20am in EDT because the closure of the valve prevented from flow of sea water.
TEPCO is trying to open another valve to release high pressure in the reactor vessel, which took place due to the lack of sea water supply, and keep condition in which sea water flow will be assured.

@yamachika
==

Satorius, Mark

From: LIA04 Hoc
Sent: Wednesday, March 16, 2011 6:50 PM
To: katefuller@deq.gov.mp
Cc: OST05 Hoc; Maier, Bill; Heck, Jared; Satorius, Mark; Flannery, Cindy; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michelle; Turtil, Richard; Virgilio, Rosetta
Subject: U.S. Nuclear Regulatory Commission Communication to Northern Mariana Islands
Attachments: PressReleaseNRCProvides PAG Rec11-050.pdf; Final3_13 2pmNRC PressRelease.pdf

Thank you Ms. Fuller (Northern Mariana Islands) for your assistance in developing appropriate contacts within your government and with Guam and American Samoa. In response to the events in Japan, the attached U.S. Nuclear Regulatory Commission (NRC) press releases have been released by the NRC and can also be found at NRC's web site at www.nrc.gov.

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

The NRC's web site will continue to be updated with press releases that address ongoing events in Japan.

Again, thank you for your assistance.

Richard Turtil
State Liaison – Liaison Team
Incident Response Center
301-816-5100, State Liaison

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NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

Office of Public Affairs Telephone: 301/415-8200
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Blog: http://public-blog.nrc-gateway.gov

No. 11-050 March 16, 2011

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

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

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

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

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

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

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NRC NEWS

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

No. 11-046 March 13, 2011

(Revised)

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

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

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

During a nuclear event the NRC has requirements to protect populations around reactors. For instance, the U.S. evacuation standard at 10 miles is roughly equivalent to the 20-kilometer distance recommended in Japan. The United States also uses sheltering in place and potassium iodide, protective measures also available in Japan. United States citizens in Japan are encouraged to follow the protective measures recommended by the Japanese government. These measures appear to be consistent with steps the United States would take.

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

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Satorius, Mark

From: Satorius, Mark
Sent: Wednesday, March 16, 2011 10:28 AM
To: Pederson, Cynthia
Subject: FW: UPDATE: NRC IS RESPONDING TO JAPANESE EVENTS

last email from me for the rest of the trip, i promise. i know you are aware that this issue of whom calls should be referred to caused great ankst w/ our opa folks. this message suggests another protocol change that may need clarification.

bye!

From: Operations Center Bulletin
Sent: Wednesday, March 16, 2011 10:39 AM
To: Operations Center Bulletin
Subject: UPDATE: NRC IS RESPONDING TO JAPANESE EVENTS

THIS IS NOT A DRILL

The Office of Public Affairs is expecting a large volume of calls from media and the general public regarding the latest statements from the State Department and the NRC regarding the situation in Japan. ALL CALLS from media or the general public on this topic must be referred to the 301-415-8200 number.

The NRC is coordinating its actions with other Federal agencies as part of the U.S. government response to the events in Japan. The NRC is examining all available information as part of the effort to analyze the event and understand its implications both for Japan and the United States. The NRC's Headquarters Operations Center in Rockville, MD has been stood up since the beginning of the emergency in Japan and is operating on a 24-hour basis.

NRC Incident Responders at Headquarters have spoken with the agency's counterpart in Japan and offered the assistance of U.S. technical experts. NRC representatives with expertise on boiling water nuclear reactors have deployed to Japan as part of a U.S. International Agency for International Development (USAID) team. USAID is the Federal government agency primarily responsible for providing assistance to countries recovering from disasters.

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

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

Two important reminders:

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

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

Other Sources of Information:

USAID – www.usaid.gov
U.S. Department of State – www.state.gov
FEMA – www.fema.gov
White House – www.whitehouse.gov
Nuclear Energy Institute – www.nei.org
International Atomic Energy Agency – www.iaea.org/press

No response to this message is required.

THIS IS NOT A DRILL

Satorius, Mark

From: Satorius, Mark
Sent: Wednesday, March 16, 2011 10:21 AM
To: Pederson, Cynthia
Subject: FW: (Action) Tsunami Fact Sheet - NUREG issued in March 2009 Link

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From: Leeds, Eric
Sent: Monday, March 14, 2011 3:38 PM
To: Grobe, Jack; Virgilio, Martin; Weber, Michael
Cc: Nguyen, Quynh; Ruland, William; Skeen, David; Brown, Frederick; Brenner, Eliot; Collins, Elmo; Dean, Bill; Satorius, Mark; McCree, Victor; Schmidt, Rebecca; Boger, Bruce
Subject: FW: (Action) Tsunami Fact Sheet - NUREG issued in March 2009 Link

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

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

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

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

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

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

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

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

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

Thanks Mark

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

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

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

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

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

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

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

Thanks,

John

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

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

Satorius, Mark

From: HRMSBulletin Resource
Sent: Wednesday, March 16, 2011 8:52 AM
To: HRMSBulletin Resource
Cc: HRMSBulletin Resource
Subject: New Agency Wide TAC Number

All Employees,

Due to the most current event in Japan, the Agency has decided to establish a new Agency wide Activity Code. It is: ZG0061 - Japan Earthquake and Tsunami. The PA will be: 111180 – Response Program-Event/Response - Operating RX. Please be reminded that if you charged hours to D92374 in PP6, you will need to submit a corrected time card and use the new TAC number ZG0061 under PA 111180. Also please contact your T & L Coordinator to have that TAC established in your profile.

Thank you for your cooperation.

Time, Labor and Payroll Services

W/140

-NSDR

From: Operations Center Bulletin
To: Operations Center Bulletin
Subject: UPDATE: NRC IS RESPONDING TO JAPANESE EVENTS
Date: Wednesday, March 16, 2011 12:52:45 PM

THIS IS NOT A DRILL

The Office of Public Affairs is expecting a large volume of calls from media and the general public regarding the latest statements from the State Department and the NRC regarding the situation in Japan. ALL CALLS from media or the general public on this topic must be referred to Regional Public Affairs or the 301-415-8200 number for HQ employees.

THIS IS NOT A DRILL

*****Event Information is Attached*****

The NRC is responding to an event.

Please contact the NRC Executive Support Team if necessary at 301-816-5100 or reply to this e-mail.

W/141

-OEDO

From: Virgilio, Martin
To: Borchardt, Bill
Cc: Weber, Michael; Leeds, Eric; Dorman, Dan; Miller, Chris; Lewis, Robert; Doane, Margaret; Powell, Amy; Wiggins, Jim; Casto, Chuck; Brenner, Eliot; Muessle, Mary; Andersen, James; Wittick, Brian; Grobe, Jack; Evans, Michele; Ash, Darren
Subject: FW: commission meeting outline.docx
Date: Wednesday, March 16, 2011 3:29:21 AM
Attachments: commission meeting outline.docx

Bill

Last night the Chairman briefed the Commissioners on the status of the events in Japan and NRC's response. During that meeting the Commissioners suggested NRC hold a Commission meeting either this week or next on the events and the Chairman agreed to the meeting.

Attached is a draft outline for that meeting. We believe this outline could also be used as a tool for organizing a presentation for Congressional Briefings and interactions with the media. We acknowledge the ambitious nature of the outline and the fact that we might not be ready to speak to each of the issues if the Commission meeting is held this week.

Marty

W/1/42

Commission Meeting Outline

NRC Response to Core Damage Accident in Japan

Current Status of Fukushima Daiichi

- Reactors
- Spent Fuel Pools

Consequence Projections

NRC Response Objectives

- Support of US Citizens in Japan
- Support of the Japanese Government
- Advance Our Understanding of Safety and Risk

NRC Response Actions

- In Japan
- At HQ

US Government Response

- NRC Partners and Stakeholders

Challenges to Success in the Response

- Information
- Coordination

Situation Assessment For US Reactors and Applicants (JCO)

- External Events
- Severe Accidents

Path Forward and Priorities

- Near Term Actions
  - In Support of Response
- Longer Term Actions
  - Lessons Learned From this Event
  - Resolution of GSI 19

From: Givvines, Mary – NRR
To: Bahadur, Sher; Blount, Tom; Brown, Frederick; Cheok, Michael; Cunningham, Mark; Evans, Michele; Galloway, Melanie; Giitter, Joseph; Givvines, Mary; Hiland, Patrick; Holian, Brian; Howe, Allen; Lee, Samson; Lubinski, John; Lund, Louise; McGinty, Tim; Nelson, Robert; Quay, Theodore; Ruland, William; Skeen, David
Cc: Leeds, Eric; Grobe, Jack; Boger, Bruce
Subject: FW: Additional Staff requirements outside Ops Center Long Term Staffing
Date: Wednesday, March 16, 2011 12:57:18 PM
Importance: High

All,

I will go ahead and lead this effort to obtain a list of potential staff. I know that Bill is super busy – can you provide me with names and I will forward to the EDO office? I would appreciate sending me names by noon tomorrow.

Thanks

From: Grobe, Jack – NRR
Sent: Wednesday, March 16, 2011 11:18 AM
To: Givvines, Mary; Ruland, William
Cc: Leeds, Eric; Boger, Bruce
Subject: Fw: Additional Staff requirements outside Ops Center Long Term Staffing
Importance: High

Mary and Bill.

Please take the lead and respond directly.
Jack Grobe, Deputy Director, NRR

From: Muessle, Mary – OEDO
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
Sent: Wed Mar 16 09:31:40 2011
Subject: Additional Staff requirements outside Ops Center Long Term Staffing

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

W/143

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 — NSIR
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

Satorius, Mark

From: McCree, Victor
Sent: Wednesday, March 16, 2011 9:17 AM
To: Collins, Elmo; Satorius, Mark; Dean, Bill
Cc: Wert, Leonard; Howell, Art
Subject: RE: Additional Staff requirements outside Ops Center Long Term Staffing

Thanks. IF he goes..., it'll be sufficiently brief in duration (no more than a week), and he'll be back in time to support our EOC public meetings which start late next week.

Vic

From: Collins, Elmo
Sent: Wednesday, March 16, 2011 10:14 AM
To: McCree, Victor; Satorius, Mark; Dean, Bill
Cc: Wert, Leonard; Howell, Art
Subject: RE: Additional Staff requirements outside Ops Center Long Term Staffing

Vic
Here in Region IV, one of the PAOs is out for medical reasons, the remaining is swamped – very tough - something to think about before you let one of yours go
Elmo

From: McCree, Victor
Sent: Wednesday, March 16, 2011 8:59 AM
To: Collins, Elmo; Satorius, Mark; Dean, Bill
Cc: Wert, Leonard
Subject: RE: Additional Staff requirements outside Ops Center Long Term Staffing

Thanks Mary...and I agree with Bill. However, we may have one nominee—one of our PAOs to provide temporary support to OPA.

Vic

From: Collins, Elmo
Sent: Wednesday, March 16, 2011 9:57 AM
To: Satorius, Mark; Dean, Bill; McCree, Victor
Subject: FW: Additional Staff requirements outside Ops Center Long Term Staffing
Importance: High

I suggest that regions not be first in line to support this function
Elmo

From: Muessle, Mary
Sent: Wednesday, March 16, 2011 8:32 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;

W/144

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,

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Thanks for your support.

Michele

Satorius, Mark

From: Dean, Bill
Sent: Wednesday, March 16, 2011 9:52 AM
To: Evans, Michele
Cc: McCree, Victor; Collins, Elmo; Pederson, Cynthia; Howell, Art; Wert, Leonard; Satorius, Mark
Subject: Re: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing

Ok. Thanks.
Bill Dean
Regional Administrator
Region I, USNRC
Sent from NRC BlackBerry

From: Evans, Michele
To: Dean, Bill
Cc: Lew, David
Sent: Wed Mar 16 10:14:59 2011
Subject: RE: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing

Bill,

Nothing yet. For now it is the same skill set as before. As soon as I have additional guidance, I will share. That may not come for a few days though - since the situation is evolving in Japan.

Michele

From: Dean, Bill
Sent: Tuesday, March 15, 2011 6:12 PM
To: Evans, Michele
Cc: Lew, David; Wilson, Peter; Lorson, Raymond; Roberts, Darrell; Collins, Daniel; Weerakkody, Sunil; Clifford, James
Subject: Re: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing

Michele, is there any further clarification on skill sets for the people possibly going to Japan??
Bill Dean
Regional Administrator
Region I, USNRC
Sent from NRC BlackBerry

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

W/145

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.

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Thanks for your support.

Michele

Satorius, Mark

From: LIA04 Hoc
Sent: Wednesday, March 16, 2011 6:08 AM
To: Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; Maier, Bill; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena; Collins, Elmo; Dean, Bill; Heck, Jared; McCree, Victor; Satorius, Mark
Cc: Piccone, Josephine; Flannery, Cindy; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michelle; Turtil, Richard; Virgilio, Rosetta
Subject: QA's for Talking to the Public
Attachments: boardfile.docx

Please see attached

Amanda Noonan
State Liaison – Liaison Team
Incident Response Center

W/1246

Questions and Answers for OPA:
March 15, 2011; 8:50 pm

1. **Can this happen here?**

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

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

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

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

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

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

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

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

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

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

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

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

7. What else can go wrong?

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

8. What is the worst-case scenario?

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

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

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

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

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

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

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

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

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

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

See response to Question 10.

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

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

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

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

16. What are the risks to my children?

See response to Question 15.

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

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

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

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

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

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

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

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

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

21. How many plants are located in seismic areas?

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

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

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

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

Additional information regarding the use of potassium iodide can be found on NRC's webpage at the following link:
http://www.nrc.gov/about-nrc/emerg-preparedness/about-emerg-preparedness/potassium-iodide-use.html

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

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

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

NSIR

Zabel, Joseph

From: Orr, Mark (RES)
Sent: Wednesday, March 16, 2011 1:20 PM
To: Willbanks, Charles; Notich, Mark; Beissel, Dennis; Rikhoff, Jeffrey; Carpenter, Robert; Jervey, Richard; Zabel, Joseph
Subject: FW: IRC Staffing

Any interest?

From: Sheron, Brian (RES)
Sent: Tuesday, March 15, 2011 5:27 PM
To: Coyne, Kevin; Case, Michael; Coe, Doug; Correia, Richard; Gibson, Kathy; Lui, Christiana; Richards, Stuart; Sangimino, Donna-Marie; Scott, Michael; Uhle, Jennifer; Valentin, Andrea
Cc: Dion, Jeanne
Subject: IRC Staffing

I participated on a conference call with other ODs and led by Michele Evans, acting deputy OD in NSIR at 4 pm today.

The purpose of the conference call was to discuss staffing for the IRC for the near future. The IRC is currently staffed with members of the Reactor safety team, the Protective Measures team, Liaison Team, etc. There is also an ET member there. None of the teams are at their full compliment. What Michele is looking for is people that can staff the IRC and relieve the staff that are currently there. She said they are currently running 3 shifts (11pm-7am, 7am – 3pm, and 3pm to 11 pm). They would like to find staff that can work shifts for 4 days in a row (I think she wants 4 days on, 3 days off). She said the staff do not have to have had IRC training.

Several of us said we would certainly canvas our staff to see who was qualified to work in the IRC and could work there, but we needed to know what technical disciplines they were looking for. Michele did not have a list of needed disciplines, but said she would generate one and send it out. As of 5:15 pm I have not received a list yet.

However, I am assuming they will be looking for staff with expertise in such areas as systems analysis, severe accidents, radiological dose assessment, etc. In anticipation that these are the technical disciplines of interest, can you please start identifying your staff that you believe have some of the requisite skills needed for the IRC, and start asking if they would be available to work shifts in the IRC if asked to. HR said they would be eligible for normal overtime compensation.

Also, they will be looking for staff to go to Japan and relieve the technical staff that recently went there. There were 2 BWR experts that left over the weekend, and a team of 9 more (6 engineers and 3 OIP staff) left yesterday. The thinking is that the staff that recently went over would come back in 2 weeks, which is when they want to send a replacement team over there. So please check to see if you have any staff with the proper technical credentials, are reasonably good communicators, and would be willing to spend about 2 weeks in Japan as part of the team there.

I will forward the list of desired disciplines as soon as I receive them from Michele. Michele said she will be looking for the list of potential IRC replacements by COB tomorrow (3/16/11), thus, I will need your candidates by mid-afternoon.

For the team that will replace the one that was just sent to Japan, she said she would like us to update the list we previously sent by COB 3/17.

W/147

Schaperow, Jason

From: Schaperow, Jason
Sent: Wednesday, March 16, 2011 6:15 AM
To: Tinkler, Charles
Subject: briefing material

Hi Charlie,

How are you?

I am at home, and am getting ready to go downtown with the EDO. I just wanted to check with you on one thing.

I am thinking that we may need some briefing material to explain to others how a station blackout progresses, including how fuel is uncovered, heats up, oxidizes, melts, becomes rubble, etc. Do we have anything like this available? Should I check with Sandia to see what they may have? Maybe we could adapt what Mark Leonard put together for the SOARCA expert review panel in August 2006, or what Dana uses for his R-800 course (Perspectives on Reactor Safety). Randy had a nice slide (slide 4) of his RIC 2011 presentation that describes fuel heatup and degradation.

What do you think?

Thanks,
Jason

W/148

Schaperow, Jason

From: Schaperow, Jason
Sent: Wednesday, March 16, 2011 6:22 AM
To: rogaunt@sandia.gov; kcw@dycoda.com; Tinkler, Charles
Subject: spent fuel pool temperate

http://nuclearstreet.com/nuclear_power_industry_news/b/nuclear_power_news/archive/2011/03/16/japan-nuclear-emergency-update-with-reactor-status-list031604.aspx

This link gives the Unit 4 spent fuel pool water temperature. How does it compare with your prediction, KC?

W/149

Wegner, Mary

From: Wegner, Mary
Sent: Wednesday, March 16, 2011 8:23 AM
To: Rodriguez-Luccioni, Hector
Subject: RE: Information
Attachments: image001.gif

I can handle request 1 – see attached from TEPCO and NISA. I would also like to know what the NRC is doing. The only source of information on that would be the NRC daily news items which say we have sent people there.

From: Rodriguez-Luccioni, Hector
Sent: Wednesday, March 16, 2011 8:07 AM
To: Wegner, Mary
Subject: Information

Hello Mary, good morning. I am trying to put together some slides for a Branch meeting about Japan Nuclear Plants. I was wondering if you could tell me where I could found the latest status and condition of the plants. Also I would like to include what is the NRC doing about it, what is doing to help them. Thank you very much.

Hector Luis Rodriguez-Luccioni, PhD-Chem Eng
Regulatory Guide Development Branch
Division of Engineering
Office of Nuclear Regulatory Research
(301)251-7685
Hector.Rodriguez-Luccioni@nrc.gov

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

W/150

From: Decker, David 10CFR
To: Taylor, Robert
Cc: Droggitis, Spiros; Powell, Amy; Schmidt, Rebecca
Subject: RE: Chairman Testimony
Date: Wednesday, March 16, 2011 3:00:44 PM
Attachments: NRC Chairman Jaczko Testimony for 031611 Hearing.docx
FINAL - GBJ oral statement 031611 .docx

Rob,
Here is the written and oral testimony. During the Chairman's oral testimony he provided details about what we believe the status of each of the 6 reactors at Fukushima is. This information is not in the attached oral statement, and I'm not sure where the info came from. I suspect it's what's in the latest situation report.

From: Taylor, Robert MRA
Sent: Wednesday, March 16, 2011 2:43 PM
To: Droggitis, Spiros; Decker, David
Subject: Chairman Testimony

Can you guys share the Chairman's written/oral remarks from today's hearings?

W/151

STATEMENT

BY GREGORY B. JACZKO, CHAIRMAN

UNITED STATES NUCLEAR REGULATORY COMMISSION

TO THE

HOUSE COMMITTEE ON ENERGY AND COMMERCE

SUBCOMMITTEES ON ENERGY AND POWER, ENVIRONMENT AND THE ECONOMY

MARCH 16, 2011

Mr. Chairmen, Ranking Members Rush and Green, and Members of the Subcommittees, I am honored to appear before you today to discuss the Fiscal Year (FY) 2012 budget request for the U. S. Nuclear Regulatory Commission (NRC) and to respond to any questions that you may have. During the past few weeks, I've had an opportunity to meet with a number of you and your staff. I appreciate these conversations and your interest in the NRC's work. I look forward to working with all of you as this session of Congress continues.

The NRC is an independent Federal agency established to license and regulate the Nation's civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of public health and safety, promote the common defense and security, and protect the environment. Our critical mission entails broad responsibilities for the agency. The NRC currently licenses, inspects, and assesses the performance of 104 operating nuclear power plants, as well as many fuel cycle facilities and research and test reactors. Furthermore, nuclear materials are in use at thousands of hospitals, universities, and other locations around the country. Each of these facilities and materials users presents different challenges for the NRC and requires that the NRC develop and sustain a diverse array of regulatory capabilities. The safety and security of these facilities and materials is, and always will be, our number one priority.

The NRC's Safety goal is to ensure adequate protection of public health and safety and the environment. The agency's safety program objectives are to prevent the occurrence of any nuclear reactor accidents, inadvertent criticality events, acute radiation exposures resulting in fatalities, significant releases of radioactive materials and significant adverse environmental impacts. The Security goal is to ensure adequate protection in the secure use and management of radioactive materials. The security program objective is to prevent any instances in which licensed radioactive materials are used in a hostile manner in the United States.

The NRC can be proud of its strong track record and our recognition by the international community as a leader in regulating the nuclear industry. The Commission cannot give enough credit for the NRC's effectiveness as a regulator to the NRC's diverse, hard-working, talented, and dedicated staff. The Commission is continually impressed by their expertise, experience, diversity, and commitment to public service.

It is important that the NRC maintain our commitment to continuous improvement. That has long been a defining value of the NRC and a key to our success in meeting our important safety mission. We have a responsibility to the public to always try to do better – whether by planning and prioritizing to allow for more timely implementation of agency actions by licensees, or by communicating more effectively to better engage stakeholders in agency decisions.

We also, however, have an additional imperative, in light of the prevailing budgetary climate and the strong desire by many to see federal agencies do more with less. No matter the outcomes of these current budget decisions, the agency must continue focusing on the critical task of how to make the most efficient use of our funds. The NRC must ensure that we are in

the strongest possible position to efficiently and effectively use our financial resources to meet our mission.

In this area, as in many others, good process is the key to good outcomes. In accordance with the Government Performance and Results Act, the NRC is taking steps to improve our strategic planning and annual performance plans in order to achieve greater alignment of goals and performance across the agency. As part of the NRC's efforts to build a Strategic Acquisition Program, we are taking steps to ensure agency contracting initiatives are implemented in a more timely and efficient manner. We have resources dedicated to other business process improvements including the Transforming Assets into Business Solutions (TABS), a task force focused on identifying the most efficient, effective and cost-conscious manner for the NRC to accomplish its corporate support functions.

These initiatives allow us to fully meet our safety and security responsibilities while also effectively reviewing applications associated with a renewed interest in the construction of new nuclear power plants and applications to construct and operate facilities that are part of the nuclear fuel cycle. The NRC is actively reviewing 12 combined applications to construct and operate new nuclear power reactors. Five different reactor designs are referenced in these applications; the NRC is currently reviewing the design applications for certification. If these design certifications are approved they will be available to be referenced in future COL applications, and thereby make those reviews more straightforward. The NRC is also performing safety, security, and environmental reviews of facility applications, a uranium deconversion facility application, and applications for new uranium recovery facilities.

With these efforts as a backdrop, the agency has formulated its FY 2012 budget to support the agency's Safety and Security strategic goals and objectives.

Specifics of the FY 2012 Budget Request

The NRC's FY 2012 budget request is organized by business lines within our two program areas: (1) Nuclear Reactor Safety, and (2) Nuclear Materials and Waste Safety Programs. The NRC's proposed FY 2012 budget for both programs is $1,038.1 million, including 3,981.0 full-time equivalents (FTE), which represents a decrease of $28.7 million, including an increase of 0.8 FTE, when compared to the FY 2010 funding levels. The funding levels reflected above also support the Office of the Inspector General (OIG). The OIG FY 2012 proposed budget of $10.9 million includes resources to carry out the Inspector General's mission to independently and objectively conduct audits and investigations to ensure the efficiency and integrity of NRC programs and operations and to promote cost-effective management.

Pursuant to the provisions of the Energy Policy Act of 2005, the NRC's FY 2012 budget provides for 90 percent fee recovery, less (1) appropriations from the Nuclear Waste Fund, (2) appropriations to implement Section 3166 of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005, (which pertain to waste incidental to reprocessing), and (3) appropriations to conduct generic homeland security activities. Accordingly, $909.5 million of the FY 2012 budget would be recovered from fees assessed to NRC licensees and applicants. This would result in a net appropriation of $128.6 million, which is a decrease of $26.1 million in net appropriations when compared to the FY 2010 funding levels.

Nuclear Reactor Safety Program

The Nuclear Reactor Safety Program encompasses NRC efforts to license, regulate, and oversee civilian nuclear power, research, and test reactors in a manner that adequately protects public health and safety and the environment. This program also provides high assurance of the

physical security of facilities and protection against radiological sabotage. This program contributes to the NRC's Safety and Security goals through the activities of the Operating Reactors and New Reactors Business Lines, which regulate existing and new nuclear reactors to ensure their safe operation and physical security. Overall resources requested in the FY 2012 budget for the Nuclear Reactor Safety Program are $800.8 million, including 3,032.9 FTE. This funding level represents an overall funding decrease of $8.0 million, with an increase of 48.4 FTE when compared with FY 2010 funding levels.

Within this program, the Operating Reactors Business Line supports the licensing, oversight, rulemaking, research, international activities, generic homeland security, and event response associated with the safe and secure operation of 104 civilian nuclear power reactors and 31 research and test reactors. The FY 2012 budget request for operating reactors is $521.3 million, including 2,064.4 FTE. This represents an overall funding decrease of $20.5 million, including 26.3 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources would support include the following:

- conduct technical review for 950 licensing actions, including complex actions such as license amendment requests from power reactor licensees adopting the requirements for performance standards for fire protection, often referred to as National Fire Protection Association (NFPA) 805
- review extended power uprate requests for increasing electric generating capacity and one improved standard technical specification conversion
- conduct 13 active, high- and medium-priority rulemaking activities
- conduct critical research and test reactor project management functions pertaining to license renewal application efforts, and applications to produce medical isotopes
- continue reviews of 12 license renewal applications
- conduct inspection activities for the 104 operating nuclear power reactors, including the component design-basis inspections, fire protection inspections, and generic issues inspections (approximately 100 per year)
- continue the Resident Inspector Pipeline Initiative to maintain an experienced and stable onsite inspection presence of qualified resident inspectors at the 104 nuclear power reactors

- conduct domestic and international security reviews and support for screening approximately 3,000 national and international operational events, with detailed evaluation of approximately 200 of those events
- carry out cyber security evaluations, as well as 24 force-on-force security inspections to complete a 3-year cycle for inspecting power reactors
- evaluate licensee emergency preparedness during biennial exercises

The resources within the Operating Reactors Business Line reflect a decrease in license renewal activities because of schedule changes, and the reduced number of applications that will be under review.

The New Reactors Business Line supports the licensing, oversight, rulemaking, research, international activities, and generic homeland security associated with the safe and secure development of new power reactors from design, site approval, and construction to operational status. The FY 2012 budget request for new reactors is $279.5 million, including 968.6 FTE. This represents an overall funding increase of $12.5 million, including 74.8 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources will support include the following:

- perform licensing and hearing support for 15 combined licenses, including two new combined license applications during FY 2012
- certify one design certification amendment, continue licensing reviews, rulemaking, or both on five applications and begin pre-application review on a new design
- review two early site permit applications and begin review of one new application expected in FY 2012
- develop and implement the construction inspection program
- inspect the four reactors expected to be under construction
- continue licensing and oversight activities for the construction of Watts Bar Unit 2
- conduct 15 domestic and international vendor inspections of component manufacturing quality
- conduct pre-application activities for two small modular reactor designs
- perform an acceptance review and initiate a design certification review for one small modular reactor
- continue the implementation of the Next Generation Nuclear Plant licensing strategy, which was developed in accordance with the Energy Policy Act of 2005

- continue to develop the regulatory framework that integrates the use of risk insights into the review process and support the resolution of key policy and safety issues associated with small modular reactors

The New Reactors Business Line shows an increase primarily driven by construction oversight of two new potential reactors under construction (for a total of five) and by development of the workforce to support inspection of up to an additional six reactors in future years. In addition, resources increase to support the review of new advanced reactor applications, increased pre-application interactions with prospective applicants, and funding for the one-time build-out of a new Headquarters office building.

Nuclear Materials and Waste Safety Program

The Nuclear Materials and Waste Safety Program encompasses the NRC's responsibility to license, regulate, and oversee nuclear materials and waste in a manner that adequately protects public health and safety and the environment. This program's goal is to verify the safety and security of materials and waste and protection against radiological sabotage, theft, or diversion of nuclear materials. Through this program, the NRC regulates uranium processing and fuel facilities; research and pilot facilities; nuclear materials users (medical, industrial, research, and academic); spent fuel storage; spent fuel storage casks and transportation packaging; decontamination and decommissioning of facilities; and low-level and high-level radioactive waste.

Overall resources requested in the FY 2012 budget for the Nuclear Materials and Waste Safety Program are $226.5 million, including 868.5 FTE. This funding level represents an overall funding decrease of $20.7 million, including 49.6 FTE, when compared with FY 2010 funding levels.

Within this program, the Fuel Facilities Business Line supports licensing, oversight, rulemaking, research, international activities, generic homeland security, and event response associated with the safe and secure operation of various fuel facilities, such as conversion, enrichment, and fuel fabrication facilities, and nuclear fuel research and pilot facilities. The FY 2012 budget request for fuel facilities is $55.2 million, including 226.5 FTE. This represents an overall funding increase of $0.6 million, including 18.2 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources would support include the following:

- licensing and oversight activities associated with fuel facilities and licensees with greater than critical mass quantities of special nuclear material
- operation and maintenance of the Nuclear Material Management and Safeguards System database and the Nuclear Materials Information Program
- emergency preparedness, security, and licensee performance reviews
- licensing, certification, inspection, oversight, environmental reviews, research, adjudicatory, enforcement, allegation, and other regulatory activities associated with new and operating fuel facilities, including uranium conversion and enrichment and fuel fabrication
- completion of mandatory hearings on the uranium enrichment license applications for the AREVA centrifuge and General Electric-Hitachi laser enrichment facilities
- licensing review of the International Isotopes depleted uranium deconversion facility
- oversight of construction activities at the proposed Mixed Oxide (MOX) Fuel Fabrication Facility and commencement of construction of the AREVA, General Electric-Hitachi, and International Isotopes facilities

The Fuel Facilities Business Line resources increase to account for the significant construction activities planned at the MOX facility; the commencement of construction at the AREVA centrifuge and General Electric-Hitachi laser enrichment facilities, and the International Isotopes depleted uranium deconversion facility; and to reflect staffing required at resident inspector offices. Resources also increase to support rulemaking activities regarding the potential licensing of reprocessing facilities. These increases are offset by the completion of the licensing and environmental reviews of the AREVA and General Electric-Hitachi license applications, as well as the completion of the licensing and environmental reviews for the International Isotopes depleted uranium deconversion facility application.

The Nuclear Materials Users Business Line supports the licensing, oversight, rulemaking, research, international activities, generic homeland security, event response, and State, Tribal, and Federal program activities associated with the safe and secure possession, processing, handling, and use of nuclear materials for the many and diverse uses of these materials. Resources also support the National Materials Program and the Agreement State activities. The FY 2012 budget request for nuclear materials users is $92.1 million, including 347.1 FTE. This represents an overall funding increase of $0.4 million, including 9.1 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources would support include the following:

- completion of 2,500 materials licensing actions and 1,000 routine health and safety inspections, including naturally occurring and accelerator-produced radioactive material and security inspections
- event evaluation, research, incident response, allegation, enforcement and investigations, and rulemaking activities to maintain the regulatory safety and security infrastructure needed to process and handle nuclear materials
- materials activities related to State, Tribal, and Federal programs, including oversight, technical assistance, regulatory development, and cooperative efforts
- operation of the National Source Tracking System, a secure, Web-based, nationalized central registry designed to enhance the accountability for radioactive sources
- development of the Integrated Source Management Portfolio, which consists of the National Source Tracking System, the Web-Based Licensing System, and the License Verification System
- reviews of 135–180 import/export of nuclear equipment and material license applications
- investigations into 45–55 allegations of materials-related wrongdoing

The Nuclear Materials Users Business Line resources increase slightly because of adjustments made within the business line to cover emergent activities. Overall, a slight increase resulted to address the workload associated with the implementation of the Integrated Source Management Portfolio major information technology system, which consists of the National Source Tracking System, the Web-Based Licensing System, and the License Verification System.

The Spent Fuel Storage and Transportation Business Line supports the licensing, oversight, rulemaking, research, event response, and international activities associated with the safe and secure storage of spent nuclear fuel and safe and secure transportation of radioactive materials. The FY 2012 budget request for spent fuel storage and transportation is $41.2 million, including 152.4 FTE. This represents an overall funding increase of $7.4 million, including 29.7 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources would support include the following:

- review of license requests for site-specific independent spent fuel storage installations (ISFSIs), dual-purpose (storage and transport) casks, transportation security plans, and route approvals to support safe and secure domestic and international transportation of radioactive materials, regulatory requirements for full-core offload capability at operating reactor sites, and transfer of spent fuel to ISFSIs to support reactor decommissioning
- regulatory improvements to the proficiency and effectiveness of the licensing, inspection, and enforcement programs associated with storage and transportation of spent nuclear fuel
- inspection of storage cask and transportation package vendors, fabricators, and designers to ensure safety
- resolution of technical issues associated with allowance of burn-up credit for transportation and storage casks and the transportation and storage of high burn-up fuels (greater than 45 gigawatt-days/ metric tons of uranium)
- interaction with the International Atomic Energy Agency and other international regulators to inform the development of the regulatory framework for transportation of radioactive materials, long-term spent fuel and high-level waste storage, deferred transportation, and ultimate geologic disposal

The Spent Fuel Storage and Transportation Business Line resources would increase to develop the information necessary to evaluate extended long-term storage of radioactive material. Resources are provided for a risk-informing gap study to identify methods, data, decision criteria, and regulatory actions that are needed to implement a regulatory framework for very long-term (more than 120 years) dry spent fuel storage that is enhanced by risk insights. Resources will also support a scoping study for a generic environmental impact statement for ensuring protection of the environment from such spent fuel storage. Resources will also be provided to conduct research on technical issues associated with this storage, and to coordinate

with international partners on options for harmonizing international standards for certification of transport packages and licensing of storage cask designs.

The Decommissioning and Low-Level Waste Business Line supports the licensing, oversight, rulemaking, research, and international activities associated with the safe and secure removal of a nuclear facility from service and reduction of residual radioactivity to a level that permits release of the property and termination of the NRC license. The FY 2012 budget request for decommissioning and low-level waste is $37.9 million, including 142.6 FTE. This represents an overall funding decrease of $0.3 million, including 7.6 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources would support include the following:

- project management and technical reviews for decommissioning activities for 10 power reactors, 10 decommissioning research and test reactors, 24 decommissioning materials facilities, 21 inactive Title I decommissioning, 11 Title II decommissioning, uranium recovery facilities, and five sites that are under general license with the U.S. Department of Energy (DOE)
- interfaces with licensees, applicants, Federal and State agencies, the public, other stakeholders, and Native American Tribal governments
- 8 environmental reviews and 11 safety reviews (hearings included) in support of licensing and oversight of uranium recovery facilities
- oversight of certain DOE waste determination activities and plans for waste incidental to reprocessing consistent with the NRC's responsibilities in the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005

The Decommissioning and Low-Level Waste Business Line resources decrease reflect a refocusing of long-term waste research activities and adjustments made to the contract, travel, and training needs and other carryover balances for waste incidental to reprocessing work.

The High-Level Waste Repository Business Line supports activities associated with DOE's Yucca Mountain geologic repository application. This activity terminates in FY 2011. No resources are requested in FY 2012 for this business line.

In the FY 2012 budget structure, the New Fuel Facilities and Operating Fuel Facilities Business Lines were merged into the Fuel Facilities Business Line.

Mr. Chairmen, Ranking Members, and Members of the Subcommittees, this concludes my formal testimony on the NRC's FY 2012 budget request. On behalf of the Commission, thank you for the opportunity to appear before you. I look forward to continuing to work with you to advance the NRC's important safety mission. I would be pleased to respond to any questions that you may have. Thank you.

STATEMENT
BY GREGORY B. JACZKO, CHAIRMAN
UNITED STATES NUCLEAR REGULATORY COMMISSION
TO THE
HOUSE COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEES ON ENERGY AND POWER, ENVIRONMENT AND THE ECONOMY
MARCH 16, 2011

Mr. Chairmen, Ranking Members Rush and Green, and Members of the Subcommittees, I am honored to appear before you today on behalf of the U.S. Nuclear Regulatory Commission. Given the events that are unfolding overseas, my opening remarks will focus on the crisis in Japan, and I have additional information on the Fiscal Year 2012 budget that I have submitted for the record.

I would first like to offer my condolences to all those affected by the earthquake and tsunami in Japan over the last few days. My heart goes out to those who have been dealing with the aftermath of these natural disasters.

I want to publicly acknowledge the tireless efforts, professionalism and dedication of the NRC staff in reacting to the events in Japan. This is just another example from my 6 ½ years on the Commission of the dedication of the NRC staff to the mission of protection of public health and safety. The American people can be proud of the commitment and dedication within the Federal workforce, exemplified by our staff every day.

While the NRC regulates the safe and secure commercial uses of radioactive materials in the United States, we also interact with nuclear regulators from around the world. Since Friday, the NRC's headquarters Operations Center has been operating on a 24-hour basis to monitor events unfolding at nuclear power plants in Japan. Since the earthquake hit northeastern Japan last Friday, some reactors at the Fukushima No. 1 plant have lost their cooling functions, leading to hydrogen explosions and rises in radiation levels. Two NRC experts on boiling-water reactors have already been deployed to Japan as part of a U.S. International Agency for International Development team, and they are currently in Tokyo. Since then, the Japanese government has formally asked for assistance from the United States as it continues to respond to the situation. Another NRC team is scheduled to land today.

Within the U.S., the NRC has been coordinating its efforts with other Federal agencies as part of the government response to the situation. This includes monitoring radioactive releases and predicting their path. Given the thousands of miles between Japan and the United States, Hawaii, Alaska, the U.S. Territories and the West Coast are not expected to experience any harmful levels of radioactivity.

Examining all available information is part of the effort to analyze the event and understand its implications both for Japan and the United States. The NRC has been working with several agencies to assess recent seismic research for the central and eastern part of the

country. That work continues to indicate that the U. S. public remains safe; we will continue to work to maintain that level of protection.

U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes and tsunamis. Even those plants located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster. The NRC requires that safety-significant structures, systems, and components be designed to take into account the most severe natural phenomena historically reported for the site and surrounding area. The NRC then adds a margin for error to account for the historical data's accuracy. This means that U.S. nuclear power plants are designed to be safe based on historical data from the area's maximum credible earthquake.

The NRC remains attentive to any information that can be applied to U.S. reactors. Our focus is always on keeping plants in this country safe and secure. As this immediate crisis in Japan comes to an end, we will look at whatever information we can gain from the event and see if there are changes we need to make to our own system. Within the next few days, I intend to meet with my colleagues on the Commission on the current status and to begin a discussion of how we will systematically and methodically review information from the events in Japan. In the meantime, we continue to oversee and monitor plants to ensure that U. S. reactors remain safe.

The NRC will continue to monitor the situation and provide updates via press releases and our public blog. The NRC also stands ready to offer further technical assistance as needed. We hope that this situation will be resolved soon so that Japan can begin to recover from this terrible tragedy.

Dion, Jeanne

From: Sangimino, Donna-Marie
Sent: Wednesday, March 16, 2011 1:50 PM
To: Case, Michael
Cc: Sheron, Brian; Uhle, Jennifer; Gibson, Kathy; Coe, Doug; Valentin, Andrea; Dion, Jeanne; Grancorvitz, Teresa; Kardaras, Tom; Eisenberg, Wendy
Subject: NRC travel to Japan

Mike,

Per your inquiry at the 845 meeting today, we spoke with Charlotte Abrams, Chief, International Cooperation and Assistance Branch/OIP, and inquired as to Agency guidelines on upcoming travel to Japan by NRC staff. Charlotte indicated that an Agency Announcement would be issued this week providing guidance on this question, but early indications are that "routine" travel to Japan (**not** including travel associated with the ongoing emergency) will be curtailed for the next several weeks.

We have only a few RES travelers slated to attend routine meetings in Japan over the next several weeks. I suggest we hold their travel until that announcement comes out, and then the IPT will work with the traveler to formulate an appropriate response to our international counterpart conducting the meeting.

Donna-Marie Sangimino

International Programs Team Leader
US Nuclear Regulatory Commission
Office of Nuclear Regulatory Research (RES)

Donna-Marie.Sangimino@nrc.gov
(+1) 301-251-7673

W/152

Wegner, Mary

From: Wegner, Mary
Sent: Wednesday, March 16, 2011 1:52 PM
To: ODonnell, Edward
Subject: RE: On Information About the Japanese Earthquake

NYTimes called me once. Shortly after her Editor called to check her story. I was pleasantly surprised.

From: ODonnell, Edward
Sent: Wednesday, March 16, 2011 1:43 PM
To: Wegner, Mary
Subject: RE: On Information About the Japanese Earthquake

Mary:

In the olden days our Division Director, Roger Mattson, told us if we got a phone call from the New York Times to give him (her) as straight of an answer as we could. We were trusted in those days to have enough wisdom to converse with the outside world.

Brava to you,

Ed

From: Wegner, Mary
Sent: Wednesday, March 16, 2011 12:34 PM
To: Beasley, Benjamin
Subject: On Information About the Japanese Earthquake

FYI: I am providing information to the Clearing House personnel and to you directly. I have posted to my Internet page on the S: drive which is accessible to NRC personnel. I have responded to one member of the public (John Kappenman) with info from NISA and TEPCO taken from their public sites. (John is an important source of info to me so I respond to him.)

I have NO expertise in seismic matters, I have received no requests for such information, and I could not answer them if I did. I respond to request for information about the plants with information from NISA and TEPCO.

That having been said, I think NRC policy concerning the events in Japan is WRONG! We should inform the public. As we say in our "Values" statements:

Service
...to the public, and others who are affected by our work
...responsive, accountable, proactive

Openness
...in communications and decision-making
...transparent, forthright

In fact, we are required under law to. "encourage the dissemination of scientific, technical, and practical information relating to energy so as to enlarge the fund of such information and to provide that free interchange of ideas and criticism which is essential to scientific and industrial progress and public understanding." *From Energy Reorganization Act of 1974 (P.L. 93-438)*

W/153

The Canadian Nuclear Safety Commission, the Spanish Nuclear Safety Council, the French Nuclear Safety Authority, the Indian Atomic Energy Review Board, the Swedish Stralsakerhets mydmdigheten, as well as Eletronucleaire (Brazil), Rosatom (Russia), Bruce Power (Canada), and others have all published information for the public.

Satorius, Mark

From: Operations Center Bulletin
Sent: Wednesday, March 16, 2011 11:51 AM
To: Operations Center Bulletin
Subject: UPDATE: NRC IS RESPONDING TO JAPANESE EVENTS

THIS IS NOT A DRILL

The Office of Public Affairs is expecting a large volume of calls from media and the general public regarding the latest statements from the State Department and the NRC regarding the situation in Japan. ALL CALLS from media or the general public on this topic must be referred to Regional Public Affairs or the 301-415-8200 number for HQ employees.

THIS IS NOT A DRILL

*****Event Information is Attached*****

The NRC is responding to an event.

Please contact the NRC Executive Support Team if necessary at 301-816-5100 or reply to this e-mail.

3/154

Satorius, Mark

From: Ruland, William
Sent: Wednesday, March 16, 2011 12:21 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/

W/155

Cruz, Zahira

From: Cruz, Zahira
Sent: Wednesday, March 16, 2011 2:07 PM
To: Gonzalez, Hipolito
Subject: RE: Action: Volunteers to Support Agency Response to Japanese Event

en verdad cualquier posicion de coordinator esta cool...mi posocion no esta ahi en la lista

---

From: Gonzalez, Hipolito
Sent: Wednesday, March 16, 2011 9:54 AM
To: Quinones, Lauren; Cruz, Zahira
Subject: FW: Action: Volunteers to Support Agency Response to Japanese Event

Ya nos enviaron el request a NMSS.

Zahira, que posicion es la que tu tienes en el Ops center?
Si no tienes experiencia directa con el Ops center, te dan el training rapido?

Estoy contemplando ser voluntario para "RST Comm / ERDS Operator," o "LT International Liaison (2)."

From: NMSSBOX Resource
Sent: Wednesday, March 16, 2011 9:45 AM
To: NMSS Distribution
Subject: Action: Volunteers to Support Agency Response to Japanese Event

Volunteers to Support Agency Response to Japanese Event

Yesterday, I received several requests to identify individuals who would be interested in responding to the Japanese event. Specifically,

1. NSIR has asked for volunteers who would staff selected positions in the Ops Center. These positions are listed below. Obviously, previous Ops Center training and experience is preferred but NSIR is now considering others. Note, you will be volunteering for shift work (either 8 hr or 12 hr) as the Ops Center is being staffed 24/7.

2. NSIR has asked us to identify individuals who will be sent to replace the team that has been deployed to Japan. The qualifications have not been specified but I believe they are looking for individuals with BWR and/or severe accident mitigation experience. The new team is targeted to leave on March 27 and return on April 9.

3. OIP has asked us to identify individuals, who (1) have had desk officer or other international experience and (2) are interested in helping them in the event that current staff cannot meet their work demands. (These individuals could be deployed to Japan with the team under 2 above.)

If you are interested in any of these opportunities and your workload supports this effort, please discuss your interest with your Branch Chief ASAP. I have asked that the Divisions provide me a consolidated list of volunteers by COB today, March 16.

W/1Se

Information needed –

Opportunity 1 – name, current job title, Ops Center Position of interest, previous training/experience in Ops Center or similar position (outside the Agency).
Opportunity 2 – name, current job title, status of passport, brief description of experience/training that supports this type of assignment.
Opportunity 3 – name, current job title, brief description of international experience/training that would support this assignment.

Ops Center Positions currently being staffed as of March 14.

Liaison Team
LT Director
LT Coordinator
LT Federal Liaison (2)
LT Congressional Liaison (2)
LT International Liaison (2)

Protective Measures Team
PMTR Director
PMTR Coordinator
PMTR Protective Actions Assistant Director PMTR RAAD (Radiological Assessment Assistant Director) PMTR Dose Assessment (RASCAL) RASCAL Developer PMTR GIS Analyst (Geographical Information Systems) PMTR Meteorologist

Reactor Safety Team
RST Director
RST Coordinator
Severe Accident / PRA
BWR Expert
RST Comm / ERDS Operator
RST Support (Seismology Q&A)

Schaperow, Jason

From: Schaperow, Jason
Sent: Thursday, March 17, 2011 1:51 PM
To: Tinkler, Charles
Subject: RE: RASCAL Runs justifying U.S. PARs

Did you mean to send this to me?

From: Tinkler, Charles
Sent: Thursday, March 17, 2011 11:34 AM
To: Schaperow, Jason
Subject: FW: RASCAL Runs justifying U.S. PARs

Where is the source term?

From: Lee, Richard
Sent: Thursday, March 17, 2011 11:21 AM
To: Tinkler, Charles; Salay, Michael
Subject: FW: RASCAL Runs justifying U.S. PARs

fyi

From: Hoc, PMT12
Sent: Thursday, March 17, 2011 11:05 AM
To: Gibson, Kathy
Cc: Lee, Richard
Subject: FW: RASCAL Runs justifying U.S. PARs

Hi Kathy.

FYI - Here are the full RASCAL runs from the press release. We now have Richard's name and can contact him as necessary. **This info can't be shared outside NRC**. The ET confirmed for us that MACCS code will not be used to benchmark RASCAL and that RES staff should not engage further efforts to use MACCS for this event.

K. Brock

W/152

Schaperow, Jason

From: Schaperow, Jason
Sent: Thursday, March 17, 2011 1:52 PM
To: Tinkler, Charles
Subject: RE: RASCAL Runs justifying U.S. PARs

I looked over one of the attachments. I will check to see if I can figure out what the source term is.

From: Tinkler, Charles
Sent: Thursday, March 17, 2011 11:34 AM
To: Schaperow, Jason
Subject: FW: RASCAL Runs justifying U.S. PARs

Where is the source term?

From: Lee, Richard
Sent: Thursday, March 17, 2011 11:21 AM
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Subject: FW: RASCAL Runs justifying U.S. PARs

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Cc: Lee, Richard
Subject: FW: RASCAL Runs justifying U.S. PARs

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K. Brock

W158

Weaver, Tonna

From: Nuclear Plant Journal [anu@goinfo.com]
Sent: Monday, April 18, 2011 6:07 PM
To: Miranda, Samuel
Subject: NPJ E-News April 18, 2011 Fukushima Update

Having trouble viewing this email? Click here

Like

Nuclear Plant Journal
An International Publication
Published in the United States

Nuclear Plant Journal E-News

Japan Update
April 18, 2011

In this issue of NPJ E-News you'll find an update of the Fukushima Nuclear Plants in Japan. Information is current as of April 18, 2011, 16:00 CDT. All items are directly quoted, without any editing.

In this issue

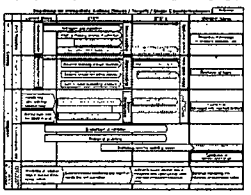
TEPCO Update

JAIF Updates

TEPCO Update

From the TEPCO website:

- **Roadmap towards Restoration from the Accident at Fukushima Daiichi Nuclear Power Station**

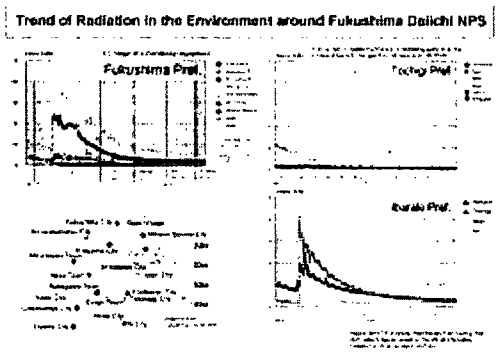


With regard to the accident at Fukushima Daiichi Nuclear Power Station due to the Tohoku-Chihou-Taiheiyo-Oki Earthquake occurred on Friday, March 11th, 2011, we are currently making our utmost effort to bring the situation under control. This announcement is to notify the roadmap that we have put together towards restoration from the accident. Click for more.

- Plant status update: Click for more

JAIF Status Update

W/159



Trends of radiation monitoring, April 17, 2011

Update 100, April 18, 2011
A PDF document provides a simple summary of each of the units at Fukushima nuclear power plants. This is a multi-page document that also provides a chronology of events and a map that details the status of each of the Japanese nuclear units.

Earthquake Update 56.

Quick Links...

- NPJ Website
- NPJ Japan Updates
- Cost-free Subscription (to NPJ)
- JAIF
- TEPCO
- NISA
- U.S. NRC Actions on Japan

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From: Galloway, Melanie MRR
To: Givvines, Mary; Bahadur, Sher; Blount, Tom; Brown, Frederick; Cheok, Michael; Cunningham, Mark; Evans, Michele; Giitter, Joseph; Hiland, Patrick; Holian, Brian; Howe, Allen; Lee, Samson; Lubinski, John; Lund, Louise; McGinty, Tim; Nelson, Robert; Quay, Theodore; Ruland, William; Skeen, David
Cc: Leeds, Eric; Grobe, Jack; Boger, Bruce
Subject: RE: Additional Staff requirements outside Ops Center Long Term Staffing
Date: Thursday, March 17, 2011 4:01:53 PM

You can add Jeremy Susco starting next week. I may have one or two more but will get back to you today if so.

rc/rca8

From: Givvines, Mary MRR
Sent: Thursday, March 17, 2011 3:48 PM
To: Givvines, Mary; Bahadur, Sher; Blount, Tom; Brown, Frederick; Cheok, Michael; Cunningham, Mark; Evans, Michele; Galloway, Melanie; Giitter, Joseph; Hiland, Patrick; Holian, Brian; Howe, Allen; Lee, Samson; Lubinski, John; Lund, Louise; McGinty, Tim; Nelson, Robert; Quay, Theodore; Ruland, William; Skeen, David
Cc: Leeds, Eric; Grobe, Jack; Boger, Bruce
Subject: RE: Additional Staff requirements outside Ops Center Long Term Staffing
Importance: High

All,

I only received 1 name from DPR and the rest are from PMDA. Any others as I need to respond today.

rc/rca8

From: Givvines, Mary – MRR
Sent: Wednesday, March 16, 2011 12:57 PM
To: Bahadur, Sher; Blount, Tom; Brown, Frederick; Cheok, Michael; 'Cunningham, Mark'; Evans, Michele; Galloway, Melanie; Giitter, Joseph; Givvines, Mary; Hiland, Patrick; Holian, Brian; Howe, Allen; Lee, Samson; Lubinski, John; Lund, Louise; McGinty, Tim; Nelson, Robert; Quay, Theodore; Ruland, William; Skeen, David
Cc: Leeds, Eric; Grobe, Jack; Boger, Bruce
Subject: FW: Additional Staff requirements outside Ops Center Long Term Staffing
Importance: High

All,

I will go ahead and lead this effort to obtain a list of potential staff. I know that Bill is super busy – can you provide me with names and I will forward to the EDO office? I would appreciate sending me names by noon tomorrow.

Thanks

rc/rca8

From: Grobe, Jack – MRR
Sent: Wednesday, March 16, 2011 11:18 AM
To: Givvines, Mary; Ruland, William
Cc: Leeds, Eric; Boger, Bruce
Subject: Fw: Additional Staff requirements outside Ops Center Long Term Staffing
Importance: High

Mary and Bill.

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Please take the lead and respond directly.
Jack Grobe, Deputy Director, NRR

From: Muessle, Mary - OEDO
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
Sent: Wed Mar 16 09:31:40 2011
Subject: Additional Staff requirements outside Ops Center Long Term Staffing

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 - NSIR
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: Grobe, Jack NRR
To: Tracy, Glenn
Subject: Re: Psychological Support
Date: Thursday, March 17, 2011 8:13:09 AM

You're the best Glenn.
Jack Grobe, Deputy Director, NRR

RCHCA 8

From: Tracy, Glenn HR
To: Grobe, Jack
Cc: Dosch, William
Sent: Thu Mar 17 07:45:47 2011
Subject: RE: Psychological Support

Thanks Jack. I have asked EAP leads to provide and also we will go out with a generic announcement for guidance similar to what we provided on recent recurring NRC employee deaths. Glenn

---

From: Grobe, Jack NRR
Sent: Wednesday, March 16, 2011 7:12 PM
To: Tracy, Glenn
Cc: Ruland, William; Hilton, Nick; Giitter, Joseph; Cheok, Michael; Lubinski, John; McGinty, Tim; Givvines, Mary; Holian, Brian; Brown, Frederick; Boger, Bruce; Leeds, Eric; 'slinnerooth@vantagehrs.com'
Subject: Re: Psychological Support

Thanks Glenn. I am providing this information to my Division Directors for their awareness and encorage them to make their staff aware of this availability doring their interactions with their staff.

Are there any preventive strategies that the EAP recommends that might be employeed, e.g., best practices to minimize problems?

Jack
Jack Grobe, Deputy Director, NRR

RCHCA 8

From: Tracy, Glenn HR
To: Grobe, Jack; Leeds, Eric
Cc: Linnerooth, Sarah; Dosch, William; Buchholz, Jeri; Powell, Dawn; Cohen, Miriam; Evans, Michele; Wiggins, Jim; Cadoux, Claude
Sent: Wed Mar 16 14:21:48 2011
Subject: Psychological Support

Jack:
Thanks so much for your e-mail. I wanted to share with you that Sarah Linnerooth and Bill Dosch of HR are proactive in their preparedness and readiness to support you and those overseas (as you can see below your note to me). We thank you for your e-mail. Bill will be enhancing awareness of such access/support and I request you and the other managers ensure that you emphasize during your interactions with the staff.
Thank so much, Glenn

Glenn,

W/161

I spoke with Claude about processes for psychological support for our staff in this time of stress. I don't know what procedures we have for these types of situations but was hoping you guys are already ahead of me on this. Claude has experience in this area. I have become aware of challenging feelings that several staff are experiencing. Please keep us informed of what we can do to help in this area. Thanks for all you do.
Jack Grobe, Deputy Director, NRR

From: Linnerooth, Sarah – HR
Sent: Tuesday, March 15, 2011 12:39 PM
To: Cohen, Miriam; Tracy, Glenn; Buchholz, Jeri; Powell, Dawn
Cc: Dosch, William; Lobe, Jon
Subject: FW: NRC Team to Japan

Hi Miriam,

Please let Jon and I know how we (EAP) can support the employees being deployed to Japan. I was able to connect with some of the employees being deployed yesterday and ensured they had our EAP contact information and knew that it is available 24/7 to both them and their family members. I contacted our EAP contractor (EAP Consultants Inc.) and confirmed that employees will still have access to services and our 800 number from Japan. Dawn and I also spoke yesterday and believe she too reached out to the employees being deployed to provide them and their family members with our EAP information.

I have also connected with NSIR management and visited the Ops Center yesterday. I left our EAP pocket cards with the Ops Center management to distribute as needed to the many employees staffing the around the clock response at the Ops center. Please let us know if you feel we should reach out to any other offices or employees.

Another concern would be to ensure we provide the needed support to the deployed employees upon their return from Japan. One service that may be appropriate for us to arrange is a Critical Incident Stress Debriefing (CISD). Our EAP team has a lot of expertise in facilitating and/or supporting CISDs. We are here to support in any way we are needed.

Thanks,
Sarah

Sarah Linnerooth
EAP and Fitness Program Manager
Office of Human Resources - Work Life & Benefits Branch
U.S. Nuclear Regulatory Commission
Mailstop: T3 C4
Phone - (301) 415-7113
Sarah.Linnerooth@nrc.gov

From: Hudson, Jody – HR
Sent: Tuesday, March 15, 2011 11:38 AM
To: HR_EMPLOYEES_distribution
Subject: NRC Team to Japan

As an FYI, the following email from Eric Leeds identifies the NRC employees comprising the assistance team going to Japan. HRTD/TTC's Richard Devercelly is among them. We wish them all well on this important mission.

-

Jody Hudson
Chief Learning Officer
Human Resources Training & Development
U.S. Nuclear Regulatory Commission
Mailstop: GW-4A01
301-492-2215

From: Leeds, Eric – NRR
Sent: Monday, March 14, 2011 1:11 PM
To: Collins, Elmo; Satorius, Mark; McCree, Victor; Dean, Bill; Sheron, Brian; Tracy, Glenn; Hudson, Jody; Johnson, Michael; Miller, Charles; Haney, Catherine; Zimmerman, Roy; Stewart, Sharon; Virgilio, Martin; Weber, Michael; Borchardt, Bill; Mamish, Nader; Doane, Margaret; Muessle, Mary
Cc: Boger, Bruce; Grobe, Jack; Ruland, William; Meighan, Sean
Subject: Confirmation of names for Japan

Folks –

Thanks so much for your help – we have a strong database of names/expertise to support the Japanese. For this first wave, we are sending Chuck Casto, John Monninger, Tony Nakanishi, Tim Kolb, Jack Foster and Richard Devercelly. I believe that Bruce Boger has contacted all those going to join Tony Ulsis and Jim Trapp in Japan.

I imagine that at some point we may need to send a second wave of responders to relieve our first wave. We will let you know as soon as we know if this needs to be done. We are also sensitive not to over-burden any one office.

Thanks again for your support!

release

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission

301-415-1270

From: Howe, Allen NRR
To: Leeds, Eric; Grobe, Jack; Boger, Bruce
Cc: Meighan, Sean; Ruland, William; Boska, John; Nelson, Robert; Giitter, Joseph
Subject: FW: Japan Event Commission Meeting
Date: Thursday, March 17, 2011 9:53:18 AM
Attachments: 110321 NRC Response to Events in Japan Scheduling Note.docx
110321 Closed Events in Japan and Commission Agenda Scheduling Note.docx

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From: Merzke, Daniel EDO
Sent: Thursday, March 17, 2011 7:50 AM
To: Howe, Allen
Subject: FW: Japan Event Commission Meeting

Allen, here are the scheduling notes that SECY sent to the Chairman's office.

From: Bavol, Rochelle SECY
Sent: Thursday, March 17, 2011 7:43 AM
To: Andersen, James; Merzke, Daniel
Cc: Laufer, Richard
Subject: RE: Japan Event Commission Meeting

Good Morning,

Attached are the two scheduling notes for meetings regarding the events in Japan that were sent to the Chairman's office yesterday. Both say the meetings are on Monday, but there has not been a decision when the meetings will be held. They could be Monday, Tuesday or Wednesday. I'm hoping that we can at least get this decision today.

The closed meeting is about NRC's strategy to address significant issues and the Commission's agenda (what meetings should the Commission have based on the events in Japan-ones already scheduled and new meetings; what meetings should be postponed and be replaced by different meetings; what papers should the Commission focus on; what papers could be delayed), all based on the events in Japan and how we may need to refocus, at least for the next six months.

Let me know if there are questions.

I'll let you know as we get decisions on these meetings.

Rochelle

From: Andersen, James — OEDO
Sent: Wednesday, March 16, 2011 12:07 PM
To: Bavol, Rochelle — SECY
Cc: Merzke, Daniel
Subject: Japan Event Commission Meeting

Rochelle,

We are starting to get questions from the staff on this meeting. Can you please use Dan

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and myself as the OEDO contacts when you find out any information. I would like to try to keep this somewhat in process. Thanks.

Jim A.

Draft: 3/16/11

SCHEDULING NOTE

Title: **BRIEFING ON NRC RESPONSE TO RECENT NUCLEAR EVENTS IN JAPAN (Public Meeting)**

Purpose: To provide the Commission a status on the recent events in Japan, NRC's response, and planned actions.

Scheduled: **March 21, 2011**
9:00 am

Duration: Approx. 2 hours

Location: Commissioners' Conference Room OWFN

Participants:	**Presentation**
NRC Staff Panel	**50 mins.***
Bill Borchardt, Executive Director for Operations Topic: Overview of Japanese event and U.S. response	15 mins.*
Mike Weber, Deputy Executive Director Materials, Waste, Research, State, Tribal and Compliance Programs Topic: Potential Consequences; what will be seen in the U.S.	10 mins.*
Marty Virgilio, Deputy Executive Director for Reactor and Preparedness Programs Topic: Situation assessment for U.S. reactors and applicants	10 mins.*
Elliot Brenner, Director, Office of Public Affairs Topic: Communication challenges	5 mins.*
Eric Leeds, Director, Office of Nuclear Reactor Regulation Topic: Path forward; near term and longer term	10 mins.*
Commission Q & A	**50 mins.**
Discussion – Wrap-up	**5 mins.**

Documents:
Background materials due to SECY: prior to the briefing.
Slides due to SECY: prior to the briefing.

Draft: 3/16/11

SCHEDULING NOTE

Title: **DISCUSSION OF MANAGEMENT ISSUES (Closed – Ex. 9)**

Purpose: To provide the Commission an opportunity to discuss strategy for addressing issues of most interest for inquiry based on the recent events in Japan and discuss the focus of the Commission's agenda.

Scheduled: **March 21, 2011**
11:00 am

Duration: Approx. 1.5 hours

Location: Commissioners' Conference Room, 1st fl OWFN

	Presentation
NRC Staff	**20 mins.***

Topics:

- Strategy for Addressing Issues of Most Interest for Inquiry Based on the Recent Events in Japan
- Focus of the Commission's Agenda over the Next Six Months

Commission Q & A and Discussion	**50 mins.**
Discussion – Wrap-up	**5 mins.**

*For presentation only and does not include time for Commission Q & A's

Documents:
Background materials due to SECY: prior to the briefing.
Slides due to SECY: prior to the briefing.

From: EDO Update
To: Taylor, Renee
Subject: EDO Update
Date: Thursday, March 17, 2011 4:09:15 PM

EDO Banner EDO Banner

EDO Update

Thursday, March 17, 2011

The situation at the Fukushima reactor site in Japan continues to be very serious and dynamic. The NRC has responded quickly and effectively to an incredibly challenging situation. We have staffed the Operations Center 24/7 since last Friday and we have a team of 11 individuals who are in Japan to 1) provide support to the U.S. ambassador and the embassy, 2) interface with the Japanese regulator and licensee, and 3) help to facilitate coordination of the U.S. Government response. The Chairman was on Capitol Hill yesterday to brief committees of both the House and Senate on what is happening and how the NRC is responding. The quality of the work done by the NRC staff is clearly recognized and appreciated by all of our stakeholders.

Given the available information, we continue to be very concerned about the condition of three reactor cores and two spent fuel pools. Based on calculations performed by NRC experts for the situation as a whole, we now believe that it is appropriate for U.S. residents within 50 miles of the Fukushima reactors to evacuate. Our recommendation is based on NRC guidelines for public safety that would be used in the U.S. under similar circumstances. At the same time, however, we do not expect any part of the U.S. or its territories to experience any harmful levels of radioactivity, given the great distances involved. We continue to do analyses to verify our understanding of this issue. The NRC is working closely with our federal partners to monitor radiation releases from the Japanese nuclear power plants.

We will continue to place emphasis on communication activities. The agency is being flooded with phone calls from the media, stakeholders, and the general public. Once again, thank you to everyone who is pitching in to help deal with this volume of activity.

Given the dynamic situation, there will be an All-Hands meeting tomorrow at 2:00 p.m. in the One White Flint auditorium, with VTC to the regions, Technical Training Center, and headquarters satellite offices. Overflow seating will be available in

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the TWFN Exhibit Area as well as the Commission Hearing Room. (There will also be a bridge line: 888-820-8960; pass code: 8690842.) I will give you an update on what we know, and answer any questions to the best of my ability. In addition, we are expecting to have a Commission meeting early next week. We will provide a link to the briefing materials as soon as possible. Finally, you may find these documents prepared by the Office of Nuclear Reactor Regulation to be of interest: http://portal.nrc.gov/edo/nrr/default.aspx.

Bill Borchardt, EDO

Appendix A

Reeves, Rosemary

From: P.Kaiser@iaea.org
Sent: Thursday, March 17, 2011 10:03 AM
To: Reeves, Rosemary
Cc: R.Spiegelberg-Planer@iaea.org; WebEditor@iaea.org
Subject: RE: Feedback on INES Rating for Japanese Event / query from US Nuclear Regulatory Commission

Dear Ms. Reeves,

The INES rating is determined by the IAEA Member State that reports the event. The Fukushima nuclear accident currently has been rated by the Japanese authorities as a Level 4 event.

My colleague from INES, Rejane Spiegelberg Planer, Senior Safety Officer, is copied should you have more detailed queries on the INES system,

With best regards,
Peter

Peter Kaiser | Section Head - News & Information / Public Information Division
International Atomic Energy Agency | VIC PO Box 100, 1400 Vienna, Austria
Tel.: +43 2600 21286 | Mobile: +43 699 165 21286

From: Rosemary.Reeves@nrc.gov [mailto:Rosemary.Reeves@nrc.gov]
Sent: Thursday, 17 March 2011 14:30
To: WebEditor - Public Information
Subject: Feedback on INES Rating for Japanese Event
Importance: High

Hello,

Can you please find out the answer to this question?

Has the IAEA upgraded the rating of the Fukushima nuclear reactor event yet? I had read a few days ago that IAEA had given the accident a level 4 rating on the International Nuclear and Radiological Event Scale.

Thanks,

Rosemary Reeves
Project Manager
FCSS, Advanced Fuel Cycle, Enrichment, &Uranium Conversion Branch
Office of Nuclear Materials Safety and Safeguards
US Nuclear Regulatory Commission
Washington, DC 20555
Phone: 301-492-3156
Mail Stop: E2-C40M

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From: Givvines, Mary
To: Bahadur, Sher; Blount, Tom; Brown, Frederick; Cheok, Michael; Evans, Michele; Galloway, Melanie; Giitter, Joseph; Givvines, Mary; Hiland, Patrick; Holian, Brian; Howe, Allen; Lee, Samson; Lubinski, John; McGinty, Tim; Nelson, Robert; Quay, Theodore; Ruland, William; Skeen, David; Westreich, Barry
Cc: NRR_BRANCH_CHIEFS; Leeds, Eric; Grobe, Jack; Boger, Bruce; Gorham, Tajuan; Compton, Makeeka
Subject: FW: WAIVER OF WORK SCHEDULE AND PAY CAP RULES FOR WORK IN RESPONSE TO THE EVENTS IN JAPAN
Date: Thursday, March 17, 2011 9:33:04 AM
Attachments: Memo re- Waiver of Work Schedule and Pay Cap Rules for Work in Response to the Events in Japan..pdf

---

LT,

If the attached memo still doesn't address all your staff's work schedule flexibilities while supporting the Japan situation – please let me know.

Mary

From: Khan, Charline
Sent: Thursday, March 17, 2011 7:29 AM
To: RidsAcrsAcnw_MailCTR Resource; RidsAslbpManagement Resource; RidsOgcMailCenter Resource; RidsOcaaMailCenter Resource; RidsOcfoMailCenter Resource; RidsOigMailCenter Resource; RidsOipMailCenter Resource; RidsOcaMailCenter Resource; RidsOpaMail Resource; RidsSecyMailCenter Resource; RidsSecyCorrespondenceMCTR Resource; RidsEdoMailCenter Resource; RidsAdmMailCenter Resource; RidsCsoMailCenter Resource; RidsOeMailCenter Resource; RidsFsmeOd Resource; RidsOiMailCenter Resource; RidsOIS Resource; RidsHrMailCenter Resource; RidsNroOd Resource; RidsNroMailCenter Resource; RidsNmssOd Resource; RidsNrrOd Resource; RidsNrrMailCenter Resource; RidsResOd Resource; RidsResPmdaMail Resource; RidsSbcrMailCenter Resource; RidsNsirOd Resource; RidsNsirMailCenter Resource; RidsRgn1MailCenter Resource; RidsRgn2MailCenter Resource; RidsRgn3MailCenter Resource; RidsRgn4MailCenter Resource
Cc: Davidson, Lawrence; Buchholz, Jeri; Johns, Nancy
Subject: WAIVER OF WORK SCHEDULE AND PAY CAP RULES FOR WORK IN RESPONSE TO THE EVENTS IN JAPAN

MEMORANDUM TO: Those on the Attached List

FROM: Miriam L. Cohen, Director/**RA by J. Buchholz for/**
Office of Human Resources

DATED: March 16, 2011

SUBJECT: WAIVER OF WORK SCHEDULE AND PAY CAP RULES FOR WORK IN RESPONSE TO THE EVENTS IN JAPAN

ADAMS Accession No. ML11075A003 refers

NOTE: Electronic distribution only

Charline Khan
Administrative Assistant (Rotation)
U.S. NUCLEAR REGULATORY COMMISSION
Office of Human Resources
P:301-492-2318

Charline.Khan@nrc.gov

HR

March 16, 2011

MEMORANDUM TO: Those on the Attached List

FROM: Miriam L. Cohen, Director/**RA by J. Buchholz for/**
Office of Human Resources

SUBJECT: WAIVER OF WORK SCHEDULE AND PAY CAP RULES FOR WORK IN RESPONSE TO THE EVENTS IN JAPAN

I have approved a waiver of the U.S. Nuclear Regulatory Commission (NRC) work schedule rules, as well as a waiver of the biweekly cap on combined salary plus premium pay, for NRC employees serving in and supporting the NRC Operations Center, as well as NRC employees working in Japan, in response to the current, serious nuclear power plant issues in that country.

Work Schedule Limitations

NRC permits a variety of types of work schedules, including 5-4/9 compressed work schedules (CWS) and NEWFlex flexible work schedules that include limitations on permissible workdays and working clock hours. Other types of work schedules, including Expanded-Compressed work schedules (E-CWS) in emergency situations, and First-40 work schedules in unusual situations, do not contain such limitations. A summary of work schedule options may be found on the intranet at http://www.internal.nrc.gov/HR/work-schedule.html.

I have approved a waiver of limitations on permissible workdays and working clock hours for NRC employees working in response to these events. As a result, employees on 5-4/9 CWS may work weekends, employees on NEWFlex may work Sundays, and employees on both types of work schedules may work any clock hours, as appropriate (an exception to the 11.25 hour maximum limitation on NEWFlex workdays is not possible).

Biweekly Cap

As a matter of Federal-wide law and regulations, employees who are exempt from the Fair Labor Standards Act (most NRC employees are exempt) normally are subject to a biweekly cap on combined salary plus premium pay. This year, the cap is equal to the salary for GG-15 step 10. Premium pay includes the following categories: night premium pay, Sunday premium pay, holiday premium pay, overtime premium pay, and "regular" compensatory time off (not religious compensatory time off or Special Compensatory Time Off for Travel).

For further details, please see the February 3, 2011, NRC Announcement entitled "Employee Resources: 2011 Cap on Combined Salary Plus Premium Pay," available on the intranet at http://www.internal.nrc.gov/announcements/items/7625.html.

Annual Cap

Federal law and regulations permit agencies to waive the biweekly cap and to adopt an annual cap on combined salary plus premium pay when, among other reasons, an employee receives premium pay for work directly related to resolving or coping with an emergency (or its immediate aftermath) that involves a direct threat to life or property.

I have approved a waiver of the biweekly cap and adoption of an annual cap for NRC employees working in response to these events.

Procedures

Note that employees who are responding to these events will be provided a document summarizing their work schedule options as well as their entitlements to premium pay.

Employees should consult with their time and attendance officials about any necessary changes to their Human Resources Management System workgroups.

Management should advise Jackie Jones, Financial Services Branch, Office of the Chief Financial Officer, of the names of employees who perform emergency-related premium work as well as the dates of such work. Please submit this information to Ms. Jones via a memorandum mailed to T-9 E2, or via e-mail to Jackie.Jones@nrc.gov. It is important to provide Ms. Jones this information as soon as practicable after the work begins to avoid difficulties processing the appropriate payments as the annual cap will be made effective at the beginning of the pay period in which the work was performed.

Should you have any questions on this matter, please contact me or have a member of your staff contact Larry Davidson at (301) 492-2286 or Lawrence.davidson@nrc.gov.

MEMORANDUM TO THOSE ON THE ATTACHED LIST DATED: March 16, 2011

SUBJECT: WAIVER OF WORK SCHEDULE AND PAY CAP RULES FOR WORK IN RESPONSE TO THE EVENTS IN JAPAN

Edwin M. Hackett, Executive Director, Advisory Committee on Reactor Safeguards	RidsAcrsAcnw_MailCTR Resource
E. Roy Hawkens, Chief Administrative Judge, Atomic Safety and Licensing Board Panel	RidsAslbpManagement Resource
Stephen G. Burns, General Counsel	RidsOgcMailCenter Resource
Brooke D. Poole, Director, Office of Commission Appellate Adjudication	RidsOcaaMailCenter Resource
James E. Dyer, Chief Financial Officer	RidsOcfoMailCenter Resource
Hubert T. Bell, Inspector General	RidsOigMailCenter Resource
Margaret M. Doane, Director, Office of International Programs	RidsOipMailCenter Resource
Rebecca L. Schmidt, Director, Office of Congressional Affairs	RidsOcaMailCenter Resource
Eliot B. Brenner, Director, Office of Public Affairs	RidsOpaMail Resource
Annette Vietti-Cook, Secretary of the Commission	RidsSecyMailCenter Resource RidsSecyCorrespondenceMCTR Resource
R. William Borchardt, Executive Director for Operations	RidsEdoMailCenter Resource
Michael F. Weber, Deputy Executive Director for Materials, Waste, Research, State, Tribal, and Compliance Programs, OEDO	RidsEdoMailCenter Resource
Darren B. Ash, Deputy Executive Director for Corporate Management, OEDO	RidsEdoMailCenter Resource
Martin J. Virgilio, Deputy Executive Director for Reactor and Preparedness Programs, OEDO	RidsEdoMailCenter Resource
Mary C. Muessle, Acting Assistant for Operations, OEDO	RidsEdoMailCenter Resource
Kathryn O. Greene, Director, Office of Administration	RidsAdmMailCenter Resource
Patrick D. Howard, Director, Computer Security Office	RidsCsoMailCenter Resource
Roy P. Zimmerman, Director, Office of Enforcement	RidsOeMailCenter Resource
Charles L. Miller, Director, Office of Federal and State Materials and Environmental Management Programs	RidsFsmeOd Resource
Cheryl L. McCrary, Director, Office of Investigations	RidsOiMailCenter Resource
Thomas M. Boyce, Director, Office of Information Services	RidsOis Resource
Miriam L. Cohen, Director, Office of Human Resources	RidsHRMailCenter Resource
Michael R. Johnson, Director, Office of New Reactors	RidsNroOd Resource RidsNroMailCenter Resource
Catherine Haney, Director, Office of Nuclear Material Safety and Safeguards	RidsNmssOd Resource
Eric J. Leeds, Director, Office of Nuclear Reactor Regulation	RidsNrrOd Resource RidsNrrMailCenter Resource
Brian W. Sheron, Director, Office of Nuclear Regulatory Research	RidsResOd Resource RidsResPmdaMail Resource
Corenthis B. Kelley, Director, Office of Small Business and Civil Rights	RidsSbcrMailCenter Resource
James T. Wiggins, Director, Office of Nuclear Security and Incident Response	RidsNsirOd Resource RidsNsirMailCenter Resource
William M. Dean, Regional Administrator, Region I	RidsRgn1MailCenter Resource
Victor M. McCree, Regional Administrator, Region II	RidsRgn2MailCenter Resource
Mark A. Satorius, Regional Administrator, Region III	RidsRgn3MailCenter Resource
Elmo E. Collins, Jr., Regional Administrator, Region IV	RidsRgn4MailCenter Resource

Annual Cap

Federal law and regulations permit agencies to waive the biweekly cap and to adopt an annual cap on combined salary plus premium pay when, among other reasons, an employee receives premium pay for work directly related to resolving or coping with an emergency (or its immediate aftermath) that involves a direct threat to life or property.

I have approved a waiver of the biweekly cap and adoption of an annual cap for NRC employees working in response to these events.

Procedures

Note that employees who are responding to these events will be provided a document summarizing their work schedule options as well as their entitlements to premium pay.

Employees should consult with their time and attendance officials about any necessary changes to their Human Resources Management System workgroups.

Management should advise Jackie Jones, Financial Services Branch, Office of the Chief Financial Officer, of the names of employees who perform emergency-related premium work as well as the dates of such work. Please submit this information to Ms. Jones via a memorandum mailed to T-9 E2, or via e-mail to Jackie.Jones@nrc.gov. It is important to provide Ms. Jones this information as soon as practicable after the work begins to avoid difficulties processing the appropriate payments as the annual cap will be made effective at the beginning of the pay period in which the work was performed.

Should you have any questions on this matter, please contact me or have a member of your staff contact Larry Davidson at (301) 492-2286 or Lawrence.davidson@nrc.gov.

DISTRIBUTION:
HR r/f
DIRECTORY/SUBDIRECTORY: G:\HRPP\PAY
DOCUMENT NAME: Waiver of Biweekly Cap for Japan Response.docx
WITS/EDO/HR TICKET NO. :
SUBJECT FILE FOLDER NAME:
ADAMS ACCESSION NUMBER: ML11075A003
☐ Publicly Available X Non-Publicly Available ☐ Sensitive X Non-Sensitive

OFFICE	HR/HRPP	HR/HRPP	HR/HROP	HR/ODD	HR/OD
NAME	LDavidson	NJohns LDavidson for	JBuchholz	GTracy JBuchholz for	MCohen JBuchholz for
DATE	3/16/2011	3/16/2011	3/16/2011	3/16/2011	3/16/2011

OFFICIAL RECORD COPY

From: Leeds, Eric NRR
To: Virgilio, Martin
Cc: Grobe, Jack; Boger, Bruce; Howe, Allen; Milligan, Patricia
Subject: RE: NRR Actions: near-term
Date: Thursday, March 17, 2011 7:47:33 AM

Thanks, Marty. A different thought – EP. When I was over in Japan a year ago in November, I took Trish Milligan with me because one of the areas that the Japanese were interested in discussing was EP. They were very proud that they had just completed their 9th EP exercise. Ever. I'm going to explore what we know about their EP program, maybe get some help from our folks in country, because we may want to address that at the upcoming Commission meeting.

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

release

From: Virgilio, Martin EDO
Sent: Thursday, March 17, 2011 6:08 AM
To: Leeds, Eric; Weber, Michael; Brown, Frederick
Cc: Borchardt, Bill; Boger, Bruce; Grobe, Jack; Ruland, William; Johnson, Michael; Sheron, Brian; Evans, Michele
Subject: RE: NRR Actions: near-term

Eric

I recall we have 2 suggestions in the IRRS report related to severe accident management that should be considered in formulating our actions (see items S5 and S10). This could be an opportunity to address and close on the issue related to confirming the adequacy of operating training on severe management mitigation.

Marty

From: Leeds, Eric – NRR
Sent: Wednesday, March 16, 2011 1:14 PM
To: Virgilio, Martin; Weber, Michael – OEDO
Cc: Borchardt, Bill; Boger, Bruce; Grobe, Jack; Ruland, William; Johnson, Michael; Sheron, Brian; Evans, Michele
Subject: NRR Actions: near-term
Importance: High

Please see below. NRR has assembled a team, led by an SES manager to evaluate near term actions for the agency's response to the Japanese event. At this time, we are considering inspection as well as a generic communication and a review of "sensitive" licensing actions". I will keep you informed as we go forward I have discussed the current situation in Japan with the RAs and our preliminary thoughts for regulatory actions going forward.

We have also prepared a scheduling note for the commission meeting for next week. We will send it to you.

release
w/146

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

From: Brown, Frederick
Sent: Wednesday, March 16, 2011 11:32 AM
To: Leeds, Eric; Boger, Bruce; Grobe, Jack
Subject: FW: Action: Consider potential on-site activities in near-term
Importance: High

FYI

From: Brown, Frederick
Sent: Wednesday, March 16, 2011 11:17 AM
To: Roberts, Darrell; Clifford, James; Croteau, Rick; Jones, William; Croteau, Rick; Darrell Roberts; James Clifford; Jones, William; Kennedy, Kriss; Shear, Gary; Troy Pruett; West, Steven
Cc: Vegel, Anton; Wilson, Peter; Miller, Chris; Weerakkody, Sunil; OBrien, Kenneth; Reynolds, Steven; Munday, Joel; Moorman, James; Christensen, Harold; Westreich, Barry
Subject: Action: Consider potential on-site activities in near-term
Importance: High

On the DRA call today, I'm going to float the potential for either a smart sample or a TI to look at the following areas:

- Licensee verification of 50.54(hh)(2) current status and readiness;
- Licensee verification of SBO current status and readiness consistent with their coping strategy;
- Licensee verification of Internal and External Flooding design features consistency with their licensing basis; and
- Licensee verification that their 50.54(hh)(2) equipment would survive a seismic event undamaged.

If you have thoughts, I'd like to hear them, and you may want to prep your DRAs.

Thanks,
Fred

release

Greenwood, Carol

From: Gibson, Kathy
Sent: Thursday, March 17, 2011 10:51 AM
To: Sheron, Brian
Cc: Uhle, Jennifer; Lee, Richard; Scott, Michael; Flory, Shirley
Subject: Meeting at DOE

Richard Lee will go with you this afternoon.

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Satorius, Mark

From: LIA04 Hoc
Sent: Thursday, March 17, 2011 5:47 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.

Richard Turtil
State Liaison – Liaison Team
Incident Response Center

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Satorius, Mark

From: Hay, Michael
Sent: Thursday, March 17, 2011 3:04 PM
To: Collins, Elmo; Sheron, Brian
Cc: Satorius, Mark; Dean, Bill; McCree, Victor; Vegel, Anton; Kennedy, Kriss; Pruett, Troy; Howell, Art
Subject: RE: Query: research draft report on seismic

Elmo,
I recently spoke with Mike Markley and have two points of contact, Martin Stutzke, and Kamal Manoly. I have recently spoken with Kamal and have some information to digest. Martin's specialty is PRA and Kamal is structural engineering (seismic).

Mike

From: Collins, Elmo
Sent: Thursday, March 17, 2011 2:44 PM
To: Sheron, Brian
Cc: Satorius, Mark; Dean, Bill; McCree, Victor; Vegel, Anton; Hay, Michael; Kennedy, Kriss; Pruett, Troy; Howell, Art
Subject: Query: research draft report on seismic

Brian

We've heard that a draft research report on seismic made MSNBC – contained a "ranking" of U.S. sites with respect to seismic. We are getting inquiries. Any insights for us about this report and who would be a good POC?

Elmo

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Satorius, Mark

From: LIA04 Hoc
Sent: Thursday, March 17, 2011 2:11 PM
To: Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; Maier, Bill; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena
Cc: LIA01 Hoc; LIA11 Hoc; OST05 Hoc; Piccone, Josephine; Jackson, Deborah; Turtil, Richard; 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; Virgilio, Rosetta
Subject: WHITE HOUSE CALL SUMMARY WRT COMMUNICATIONS WITH STATES

Below are a few bullets FYI regarding Charlie Miller's participation in a White House call today relative to plume modeling data and communications with States.

The Federal family is working together to develop models to determine whether the plume from the Japanese event will reach the US. This will be run through DOE NARAC (National Atmospheric Release Advisory Center)

DOE is tasked as the **LEAD** agency to provide information to the States in this regard. There will be a **call at 1900 (7 pm Eastern) this evening with Governors** to inform them about DOE aerial monitoring activities.

Also note that NRC is working to hold a **public Commission briefing Monday 3/21 – time TBD**. NRC staff will provide the Commission on the status of the Japanese event, provide an overview of staff actions to date, and any early planned actions. The meeting will be **Web streamed** and will be a good opportunity to **invite/inform our State contacts - <u>when we have all the details</u>.**

Rosetta Virgilio
State Liaison
NRC Operations Center
301-816-5193
LIA04.HOC@nrc.gov

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Susco, Jeremy

From: Susco, Jeremy NRR
Sent: Thursday, April 14, 2011 11:12 AM
To: Nguyen, Quynh
Subject: RE: URGENT ACTION - FTE regarding Japan - CANNOT BE DONE IN TIME REQUESTED

We had 7 people supporting shifts at various times, which includes a whole bunch by Holian.

We also sent one senior structural engineer to Japan, Abdul Sheikh, for a week.

From: Nguyen, Quynh NRR
Sent: Thursday, April 14, 2011 11:01 AM
To: Cartwright, William; Cusumano, Victor; Gerke, Laura; Heida, Bruce; Mahoney, Michael; Meighan, Sean; Miller, Ilyne; Nguyen, Quynh; Roquecruz, Carla; Susco, Jeremy; Titus, Brett; Valentine, Nicholee; Wertz, Trent
Subject: URGENT ACTION - FTE regarding Japan - CANNOT BE DONE IN TIME REQUESTED
Importance: High

ACTION – Come up with your estimate of heads related to Japan. For the FO, I'm counting "1.333 (repeating of course)" (One TA and then one ET member at Ops for 1/3 of the shifts).
Use your engineering judgment and just come out with a number by 145pm today.

Thanks!

From: Ruland, William NRR
Sent: Thursday, April 14, 2011 10:56 AM
To: Nguyen, Quynh; Givvines, Mary; Wertz, Trent
Cc: Ferrell, Kimberly
Subject: RE: FTE regarding Japan - CANNOT BE DONE IN TIME REQUESTED

Just get some old watch bills or talk to the division TAs and count heads. Let's not make this complicated.

From: Nguyen, Quynh NRR
Sent: Thursday, April 14, 2011 10:49 AM
To: Givvines, Mary; Wertz, Trent
Cc: Ferrell, Kimberly; Ruland, William
Subject: FTE regarding Japan - CANNOT BE DONE IN TIME REQUESTED
Importance: High

The compromise is to figure out how many folks went to Japan (but April doesn't count). Also, we could say... "NRR provided XX% of staffing for the Ops Center."

Knowing this request, we'd have to pull TACs... I don't even think it's possible to make OpsCenter calcs.

From: Givvines, Mary NRR
Sent: Thursday, April 14, 2011 10:30 AM
To: Nguyen, Quynh; Wertz, Trent
Cc: Ferrell, Kimberly
Subject: follow up to operating plan

R

Quynh or Trent,

We would really appreciate it if one of you could provide the approximate # of staff supporting the Japan effort to include in the Operating Plan as recommended by Eric. We believe you are in a better position to pull this

W/171

data. We will need it today by 2:00 pm. Again, approximation only. From PMDA, we have 2 staff that supported OPA and 3 staff that supported the Operations Center.

Thanks

Mary Givvines
Director, Program Management, Policy Development and Analysis Staff
Office of the Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
(301) 415-1275; Mary.Givvines@nrc.gov

Beasley, Benjamin

From: Beasley, Benjamin
Sent: Thursday, March 17, 2011 7:03 AM
To: Kauffman, John
Subject: FW: sharepoint site where latest and greatest seismic Q&As can be found moving forward

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From: Kammerer, Annie
Sent: Wednesday, March 16, 2011 5:29 PM
To: RES Distribution
Subject: sharepoint site where latest and greatest seismic Q&As can be found moving forward

Please see the file that contains the latest document at...

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

We will be updating this daily or almost daily in the foreseeable future. So please go to this site if you'd like to see the latest.

The site gives RES the credit since we're the lead and started it; but there is a big team supporting this that includes staff from RES, NRO, NRR and the regions.

Annie

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Beasley, Benjamin

From: Beasley, Benjamin
Sent: Thursday, March 17, 2011 7:02 AM
To: Kauffman, John
Subject: FW: RES support for commission meeting on Monday 3/21.
Attachments: Assistance with Commission Brief

Importance: High

It is likely that we will need to help Pat with some points on GI-199. Doug thinks it will be a public meeting so we should keep that in mind. Please start on a key message related to the Japanese earthquake and draft any Q&A that come to mind. I will forward some Q&A from Annie.

Ben

From: Coyne, Kevin
Sent: Wednesday, March 16, 2011 6:56 PM
To: Salley, MarkHenry; Kuritzky, Alan; Marksberry, Don; Ott, William; Beasley, Benjamin
Cc: Demoss, Gary; Stutzke, Martin; Ibarra, Jose; Hudson, Daniel; Peters, Sean; Xing, Jing; Coe, Doug; Correia, Richard
Subject: FW: RES support for commission meeting on Monday 3/21.
Importance: High

Just wanted to give you a head's up...

Still a bit fuzzy exactly what we need to provide, but we will need to help NRR with this emergent Commission briefing. NRR has the lead, but we need to be ready to lend a hand. More specifics will come after an Office TA scheduling call tomorrow, but you may want to start thinking about these topics:

Bill Borchardt intends to cover:

Advance Our Understanding of Safety and Risk

Marty Virgilio's portion will cover:

- External Events
  - Seismic
  - Flood
  - Tsunamis
- Severe Accidents
  - SBO
  - B.5.b/50.54 (hh)(2)
  - SAMGs
  - Hydrogen control
  - Emergency planning

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- Spent Fuel

Bill Borchardt's talk seems more in the DSA area (but might provide an opening for the emerging Level 3 project). Marty Virgilio appears to be touching on topics with some tie to DRA (particularly if NRR wants to address relative risk significance of these events for the US or touch on GI-199). It's a short briefing, so everything would be at a very high level. Obviously, once we have feedback from NRR we'll have a better idea where to head with this...

Kevin

From: Dion, Jeanne
Sent: Wednesday, March 16, 2011 6:43 PM
To: Coe, Doug; Gibson, Kathy; Coyne, Kevin; Case, Michael; Sheron, Brian; Uhle, Jennifer
Cc: Rini, Brett; Armstrong, Kenneth
Subject: RES support for commission meeting on Monday 3/21.

NRR has requested RES to support a commission briefing on Monday 3/21. They are looking for background information, slides, key messages, talking points and possible Q&A- see the attached message. This might be a public meeting- our input will need to be fairly high level. NRR will provide more information after the EDO alignment meeting tomorrow 3/17.

Bill Borchardt's presentation, "Overview of Japanese Event and US response"
- RES to provide slides/information on "Advancing our understanding of safety and risk" (more info to come)

Mike Weber's presentation, "Situation assessment for US reactors and applicants"
- RES to provide slides/information on "Consequence Projections in Japan and what we might expect to see in the US"

Marty Virgilio's presentation, "Situation assessment for US reactors and applicants."
-RES to assist NRR as requested.

I will be in a meeting tomorrow morning (8am to noon)- Kenneth Armstrong will attend the 8:45am meeting.

Thanks,

Jeanne Dion
Technical Assistant (Acting)
U.S. Nuclear Regulatory Commission
Office of Nuclear Regulatory Research
Jeanne.dion@nrc.gov
301-251-7482

Beasley, Benjamin

From: Beasley, Benjamin
Sent: Thursday, March 17, 2011 2:18 PM
To: Coyne, Kevin
Subject: RE: RES support for commission meeting on Monday 3/21.

Marty would be best and I have not talked with him about it. John and I are both available.

BB

From: Coyne, Kevin
Sent: Thursday, March 17, 2011 2:10 PM
To: Beasley, Benjamin
Subject: RE: RES support for commission meeting on Monday 3/21.

Ben –

Are you, John, and/or Marty able to support the Commission meeting?

From: Beasley, Benjamin
Sent: Thursday, March 17, 2011 11:14 AM
To: Wilson, George
Cc: Kauffman, John; Killian, Lauren; Manoly, Kamal; Coyne, Kevin; Stutzke, Martin
Subject: FW: RES support for commission meeting on Monday 3/21.

George,

As I mentioned on the phone call, we took the liberty of drafting a key message for the GI-199 Comm Plan. It is provided in John's message below.

I will talk to Kevin Coyne (acting director) and Marty about support for the Commission briefing. Let us know if you need anything else for the briefing or the Comm Plan.

Ben

From: Kauffman, John
Sent: Thursday, March 17, 2011 10:15 AM
To: Beasley, Benjamin
Subject: RE: RES support for commission meeting on Monday 3/21.

Ben,

For GI-199 and the Fukushima Daiichi earthquake and tsunami a key message could be (this is from Annie's document (answers 3 and 22 combined)),

> US plants are designed for appropriate earthquake shaking levels and are safe. Currently the NRC is conducting a program called Generic Issue 199, which is reviewing the adequacy of the earthquake design of US NPPs in central and eastern North America based on the latest data and analysis techniques. The NRC will look closely at all aspects of the response of the plants in Japan 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.

Key messages from the GI-199 Communications Plan (slightly tweaked) are:

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(1) In August 2010, the Safety/Risk Assessment for GI-199 was completed. That assessment found that operating nuclear power plants are safe: Plants have adequate safety margin for seismic issues. The NRC's Safety/Risk Assessment confirmed that overall seismic risk estimates remain small and that adequate protection is maintained.

(2) Though still small, some seismic hazard estimates have increased: Updates to seismic data and models indicate increased seismic hazard estimates for some operating nuclear power plant sites in the Central and Eastern United States.

(3) Assessment of GI-199 will continue: Plants are safe (see key message 1), but the NRC has separate criteria for evaluating whether plant improvements may be imposed. The NRC's Safety/Risk Assessment used readily available information and found that for about one-quarter of the currently operating plants, the estimated core damage frequency change is large enough to warrant further attention. Action may include obtaining additional, updated information and developing methods to determine if plant improvements to reduce seismic risk are warranted.

Kock, Andrea

From: Franovich, Mike
Sent: Sunday, April 17, 2011 12:32 AM
To: Ostendorff, William
Cc: Nieh, Ho; Kock, Andrea; Zorn, Jason
Subject: April 16 - One-Pagers and Slides- Fukishima Daiichi
Attachments: Japan One Pager 1500 EDT 4-16-11.pdf; Japan One Pager 2300 EDT 4-16-11.pdf; INTERIM COMPRHENSIVE Assessment 4-15-2011.ppt

The one pagers issued for 4-16 sent to the Chairman.

Also attached are the slides on the Interim Comprehensive Assessment of Fukushima Event that were used by the Japan team to brief NISA and the Japanese Government's representative for the event.

W175

Beasley, Benjamin

From: Beasley, Benjamin
Sent: Thursday, March 17, 2011 2:58 PM
To: Ake, Jon
Subject: the article

http://www.msnbc.msn.com/id/42103936/ns/world_news-asiapacific/18424719

W/176

Beasley, Benjamin

From: Giitter, Joseph
Sent: Thursday, March 17, 2011 5:45 PM
To: Mahoney, Michael; Howe, Allen; Dion, Jeanne; Collins, Timothy
Subject: DefenseinDepth.docx--Correct Version
Attachments: DefenseinDepth.docx

I think fatigue is setting in. I keep sending out the wrong version. This is the latest (as far as I know).

W/177

Q: Although there undoubtedly will be many lessons learned from the tragic events at Fukushima have you identified any early lessons that you could share with us?

A: There will undoubtedly be many lessons learned in the months and years to come as we learn more about the tragic events at the Fukushima Daiichi plant in Japan. However, one of the early lessons is this: You can't anticipate—either in the deterministic design basis of the plant or through probabilistic risk assessment models—everything that could happen. That is why the NRC's defense in depth philosophy is fundamental to ensuring that safety is achieved, even under extreme circumstances, such as those experienced at the Fukushima Daiichi plant. This NRC focus on defense in depth has led to a number of improvements in the design and operation of U.S. Nuclear Power Plants:

- Studies of severe accident prevention and mitigation in the 1980s led to a number of improvements at plants, such as installation of hardened vents at BWRs with Mark I containments. (details below).
- Also, in the 1980s (specifically in 1988) the NRC concluded that additional regulatory requirements were justified in order to provide further assurance that a loss of both offsite and onsite emergency ac power systems—a station blackout condition--would not adversely affect public health and safety. Studies conducted by the NRC have shown that the hardware and procedures that have been implemented to meet the station blackout requirements have resulted in significant risk reduction and have further enhanced defense in depth. However, we plan to carefully evaluate the lessons learned from the events in Japan to determine if enhancements to the station blackout rule are warranted.
- Emergency procedure guidelines (EPGs)—symptom-based procedures that focus on maintaining critical safety--and severe accident management (SAMGs) that address severe accident situations.
- Provisions in 50.54hh that require licensees to develop and implement guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in situations involving loss of large areas of the plant due to explosions or fire.

Details on plant modifications made to address a severe accidents at a BWR with a Mark 1 containment,

In the 1980s the NRC undertook a program to determine if any actions needed to be taken, on a generic basis, to reduce the vulnerability of all LWR designs to severe accident challenges. As part of this effort, the NRC looked specifically at the BWR Mark I containment design and identified a number of plant modifications that substantially enhance the ability of the design to prevent and mitigate the consequences of severe accidents. These recommendations (in GL 89-10) included installation of a hardened vent that allows operators, in accordance with their emergency procedures, to relieve pressure from the containment to avoid exceeding the containment pressure limit. At this time the NRC also concluded that continued reliance on pre-existing capability—which was a non-pressure-bearing vent path—could jeopardize access to vital plan areas or other equipment and create an impediment to implementing a successful accident management strategy. Furthermore, the NRC determined that implementation of reliable venting capability and procedures can reduce the likelihood of core melt from accident sequences involving loss of long-term decay heat removal, such as a station blackout event. Finally, it was concluded that the hardened vent provides assurance of a pressure relief path with significant scrubbing of fission products which would result in lower releases, even for containment failure modes not associated with pressurization, such as liner meltthrough. All U.S. BWRs with the Mark I containment design have installed hardened vents (need to verify).

The NRC also identified certain containment performance improvements that licensees should "seriously consider" individual plant examinations in addition to the implementation of a hardened vent. These improvements included an alternate source of water injection into the reactor vessel to reduce the

likelihood of core melt due to a station blackout or a loss of long-term decay heat removal, and an enhanced reactor pressure vessel depressurization system that could be operated in an extended station blackout after station batteries have been depleted. (Tim Collins: Can we say something about the extent to which licensees have implemented this).

Station Blackout Rule
Also, in the 1980s--specifically in 1988-- the NRC concluded that additional regulatory requirements were justified in order to provide further assurance that a loss of both offsite and onsite emergency ac power systems—a station blackout condition--would not adversely affect public health and safety. Studies conducted by the NRC have shown that the hardware and procedures that have been implemented to meet the station blackout requirements have resulted in significant risk reduction and have further enhanced defense in depth. However, we plan to carefully evaluate the lessons learned from the events in Japan to determine if enhancements to the station blackout rule are warranted. (Add some detail form George Wilson input.)

Operator Procedures
One of the most significant lessons learned from the Three Mile Island Accident in 1979 was that operating procedures need to be symptom based and less prescriptive. Procedures that previously directed operators to take a series of actions based on a pre-established accident were replaced with procedures that directed operators to maintain the critical safety functions-- such as keeping the core covered and cooled. Emergency procedure guidelines and severe accident mitigation guidelines, which address accidents well beyond design basis accidents and can be used for severe accident management, were developed. Operators routinely practice these procedures on a plant specific simulator to ensure that they can be implemented for a wide range of accident scenarios, including a station blackout scenario. (Should have DIRS review. Barry to provide input)

50.54hh
More recently, since the 9/11 terrorist attack, NRC has required licensees to develop, test, and be prepared to implement procedures that allow for actions pre-stage equipment that would allow operators to ensure critical safety functions are met even under extreme conditions involving fires and explosions. NRC routinely evaluates the ability of licensees to implement these strategies. (Not sure what we can and can't say. Should have DIRS review. Barry to provide input)

Near term actions
Mention steps that INPO has taken in their level 1 directive and our corresponding regulatory footprint—whatever it might be. (Not sure what we can and can't say. Might point to NEI fact sheet. Should have DIRS review. Barry to provide input)

Beasley, Benjamin

From: Beasley, Benjamin
Sent: Thursday, March 17, 2011 4:20 PM
To: Dion, Jeanne
Subject: FW: SBO impact on Mark I's
Attachments: ORNL Study Secondary Containment.pdf

John will be in the office tomorrow. He does not think that hardened vent was a Generic Issue. My next email will contain the Generic Letter on hardened vents.

Ben

From: Lane, John
Sent: Tuesday, March 15, 2011 2:28 PM
To: Beasley, Benjamin
Subject: SBO impact on Mark I's

Ben, FYI--Here is a report from ORNL from the late '80s, a time when NRC was actively studying containment/secondary containment failure issues. It provides a little bit of background information about station blackout studies undertaken then and the impact of SBO on the secondary containment.

The NRC required Mark I's to add a hardened vent around 1990, when it was discovered (probably from NUREG 1150) that the containment was likely to fail (up to 90% likely) as a result of some core melt accidents. The fix was intended to allow for a gradual release of overpressure to maintain the containment integrity as much as possible. I don't know if the Japanese plants added the hardened wetwell vent but with GE/Hitachi right there, I'm sure they are well aware of it.

W/178

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THE IMPACT OF BWR MK I PRIMARY CONTAINMENT FAILURE DYNAMICS ON SECONDARY CONTAINMENT INTEGRITY

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For presentation at
15th Water Reactor Safety Information Meeting
October 29, 1987

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ABSTRACT

During the past four years, the ORNL BWRSAT Program has developed a series of increasingly sophisticated BWR secondary containment models. These models have been applied in a variety of studies to evaluate the severe accident mitigation capability of BWR secondary containments. This paper describes the results of a recent ORNL study of the impact of BWR MK I primary containment failure dynamics on secondary containment integrity. A 26-cell MELCOR Browns Ferry secondary containment model is described and the predicted thermodynamic response of the secondary containment to a variety of postulated primary containment failure modes is presented. The effects of primary containment failure location, timing, and ultimate hole size on secondary containment response is investigated, and the potential impact of hydrogen deflagrations on secondary containment integrity is explored.

1. INTRODUCTION

The most common boiling water reactor (BWR) plant design in the United States is the BWR-4/MK I primary containment system. These plants employ secondary containments (Exhibit 1) consisting of a reactor building and refueling bay that completely surround the primary containment. Detailed severe accident analyses of MK I containment designs generally indicate that the conditional probability of primary containment failure is quite high in the unlikely event that core debris escapes the reactor vessel.

Should the primary containment pressure boundary fail, the secondary containment becomes the final barrier between the plant's fission product inventory and the environment. Traditional BWR risk studies have, however, de-emphasized the ability of the secondary containment to act as an effective fission product trap. During the past four years, the ORNL BWRSAT Program has developed a series of increasingly sophisticated BWR secondary containment models. These models have been applied in a variety of studies to evaluate the severe accident mitigation capability of BWR secondary containments.

This paper describes the results of a recent ORNL study of the impact of BWR MK I primary containment failure dynamics on secondary

containment integrity. The fundamental design characteristics of the Browns Ferry secondary containment are first discussed, followed by a brief description of potential MK I severe accident containment failure modes. A 26-cell MELCOR Browns Ferry secondary containment model is described and the predicted thermodynamic response of the secondary containment to a variety of postulated primary containment failure modes is presented. The effects of primary containment failure location, timing, and ultimate hole size on secondary containment response is investigated, and the potential impact of hydrogen deflagrations on secondary containment integrity is explored.

2. BWR SECONDARY CONTAINMENT DESIGN

Domestic BWRs of the MK I primary containment design employ a secondary containment which is comprised of a multi-floored reactor building and a refueling bay which completely surround and enclose the primary containment. Multi-unit plants employ separate reactor buildings for each unit but may utilize a common refueling bay to service all units. Exhibit 1 is a cross sectional view of the Browns Ferry Unit 1 reactor building and refueling bay (shared with Units 2 and 3). The Browns Ferry reactor building is a massive (1.4 million ft^3 or 40000 m^3), five floored structure with reinforced external concrete walls. The thickness of the walls varies from 6 ft (1.8 m) in the reactor building basement to 2.5 ft (0.76 m) at the junction of the refueling bay siding and the reactor building wall.

Secondary containment above the reactor building is provided by a 2.75 million ft^3 (77700 m^3) refueling bay which is constructed of corrugated sheet metal walls that contain large blowout panels to provide protection from the effects of tornados and steam line breaks. Not shown in Exhibit 1 are details such as stairways, elevator shafts, and internal blowout panels which provide communication pathways between the various floors of the reactor building and between the reactor building and the turbine building.

The Browns Ferry Final Safety Analysis Report[1] indicates that the above grade exterior walls of the reactor building are designed for pressures up to 250 lb/ft^2 (11970 Pa) without structural failure. The tornado design basis is a pressure decrease of 3 psi (20684 Pa) at a rate of 0.6 psi (4137 Pa) per second. The refueling bay siding is designed to withstand internal pressure in excess of 57.6 lb/ft^2 (2758 Pa) without structural failure. Pressures in excess of 50 lb/ft^2 (2394 Pa) will, however, be relieved by blowout panels in the siding.

3. MK I SEVERE ACCIDENT FAILURE MECHANISMS

The design basis accident for existing MK I primary containments is the large break loss of coolant accident in which one of the main re-

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REACTOR BUILDING AND REFUELING BAY PROVIDE BWR SECONDARY CONTAINMENT

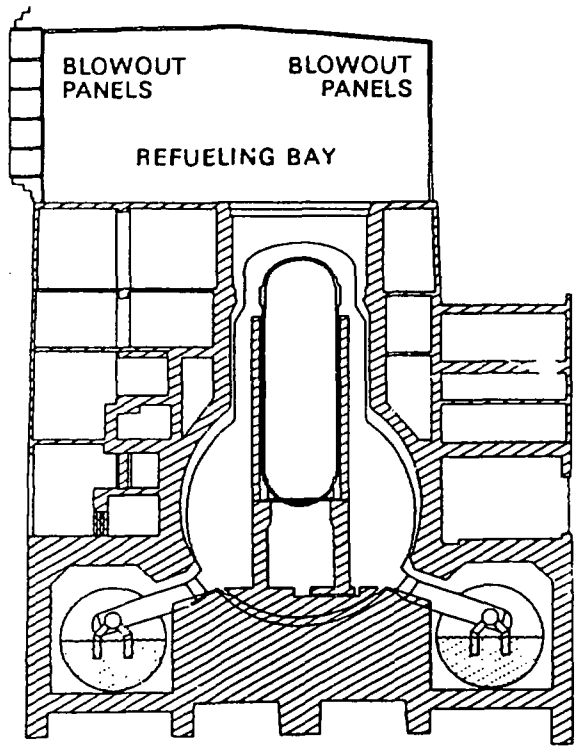

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Exhibit 1

circulation pipes is assumed to circumferentially rupture. The purpose of the primary containment is to limit the release of fission products from this accident to levels which will not exceed the limits of 10 CFR 100. This goal is accomplished by designing the containment to withstand the predicted transient pressure and temperature loads induced by the blowdown of steam and hydrogen (produced by cladding oxidation) from the reactor vessel. The design pressure and temperature of the Browns Ferry primary containment are 56 psig (487 kPa) and 281°F (411 K). The primary containment is inerted with nitrogen during reactor operation.

Recent ORNL calculations for an unmitigated short-term station blackout severe accident sequence at Browns Ferry[2] indicate that temperatures as high as 2700°F (1750 K) may be generated in the primary containment if the majority of the core was to be relocated onto the drywell floor. Maximum primary containment pressures for this case appear to be limited primarily by the containment's maximum pressure capability. A recent Chicago Bridge and Iron Company study[3] of the ultimate pressure capability of Peach Bottom's primary containment produced a maximum pressure capability estimate (assuming median gasket resiliency) of 140 psia (965 kPa), with failure predicted to occur via leakage past the drywell head flange assembly. Since the design of the drywell head flange assembly is plant specific, the Peach Bottom results cannot be applied a priori to other plants. It must be noted, of course, that the continued pressure increase associated with the evolution of noncondensible gases from an unmitigated core/concrete reaction would eventually result in over-pressure failure of the primary containment unless precluded by some other failure mechanism.

A second potential mechanism for MK I primary containment failure in an unmitigated severe accident is drywell liner (shell) ablation due to direct attack by molten corium. The ability of molten metals to erode steel structures is well documented.[4] While significant uncertainties surround the behavior of core/concrete reactions and corium spreading in a MK I containment configuration,[2] preliminary analyses indicate failure of the MK I drywell liner is quite likely if core debris does contact the inner liner surface[5].

Should the liner fail near the drywell floor elevation, the most probable sites for blowdown entry into the secondary containment are the reactor building basement torus room and the second floor of the reactor building (Exhibit 2). The transport path for the blowdown is the gap between the drywell shell and the surrounding reactor building concrete, and the annular gaps surrounding the drywell vent pipes and penetrations. These gaps provide a 145 ft^2 (13.5 m^2) flow path into the torus room and a 135 ft^2 (12.6 m^2) flow path into the second floor of the reactor building. Since elevated drywell pressures and temperatures result in swelling of the drywell liner and a reduction in the gap between the liner and the reactor building concrete (Exhibit 3), it appears that the effective flow path area for drywell blowdown would be limited by the actual size of the drywell shell rupture or the available space between the liner and the surrounding concrete. Significant

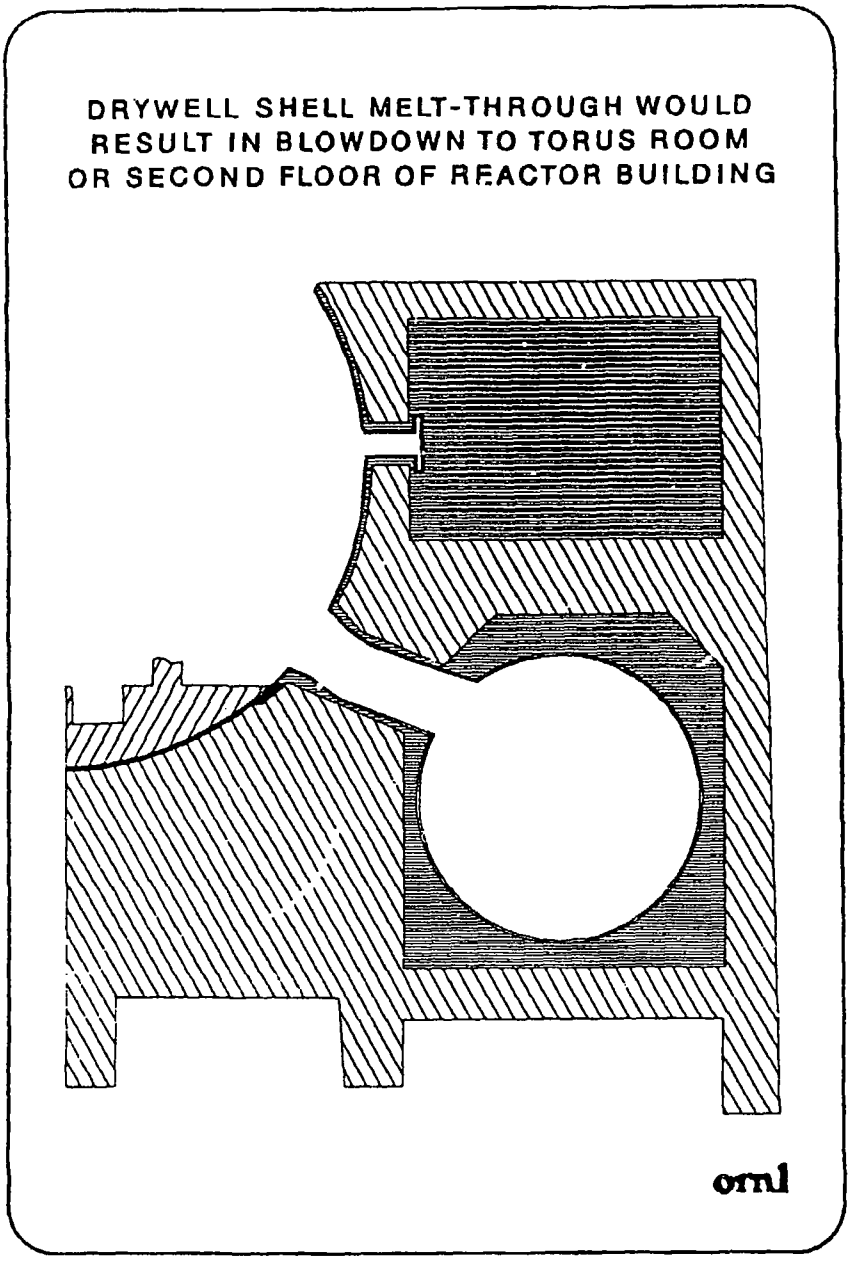
DRYWELL SHELL MELT-THROUGH WOULD
RESULT IN BLOWDOWN TO TORUS ROOM
OR SECOND FLOOR OF REACTOR BUILDING
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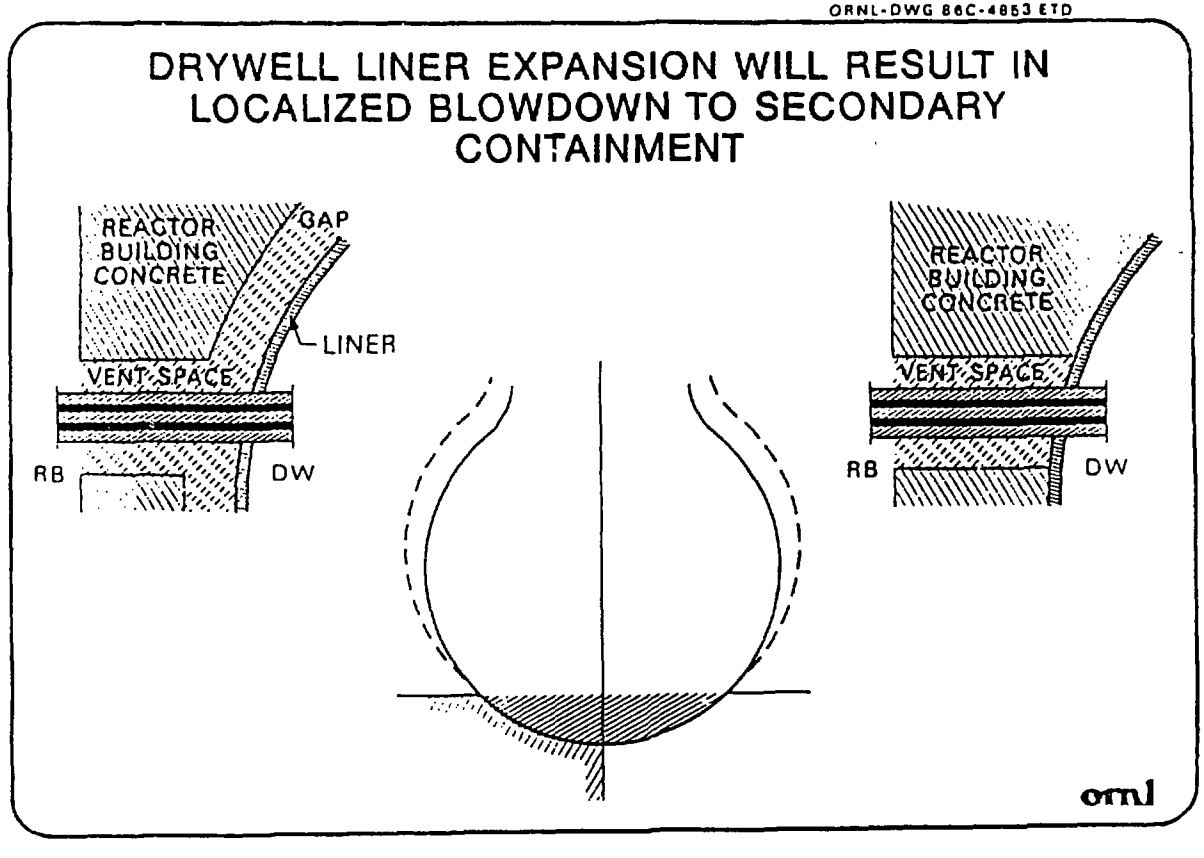
Exhibit 2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DRYWELL LINER EXPANSION WILL RESULT IN LOCALIZED BLOWDOWN TO SECONDARY CONTAINMENT
REACTOR BUILDING CONCRETE
GAP
LINER
VENT SPACE
RB
DW
REACTOR BUILDING CONCRETE
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Exhibit 3

uncertainty therefore surrounds both the ultimate hole size and the ablation time associated with opening of the hole for this drywell failure mechanism.

Given the uncertainties surrounding the dynamics of MK I primary containment failure, it appears prudent to investigate the impact of a range of failure mode assumptions on secondary containment hydrogen deflagration phenomena and building survivability. Such an investigation is possible only via detailed computer simulations of secondary containment behavior. During the past two years ORNL has developed an extremely detailed computer model of the Browns Ferry Unit 1 secondary containment. That model is described in the following section.

4. DESCRIPTION OF ORNL 26 CELL BROWNS FERRY SECONDARY CONTAINMENT MODEL

Exhibit 4 is a schematic representation of the ORNL MELCOR[6] Browns Ferry secondary containment model utilized in this study. The model employs 26 computation cells (control volumes) and 51 flow paths to represent the Browns Ferry reactor building, refueling bay, the turbine building, and the interconnections between these compartments and the outside environment. The outside environment is represented by a single control volume yielding a total of 27 computational cells. The overall model topology is dictated by the actual reactor building architecture (Exhibit 5). Each distinct room in the reactor building is represented by a separate cell, while stairwells and open doorways are characterized as flow paths. The floors, ceilings, walls, and steel structures within the reactor building, refueling bay, and turbine building are represented by 126 distinct structures. Table 1 presents a summary of the physical characteristics of each of the 26 cells. The model structure and the parameters employed in the model are based on a detailed review of drawings and on measurements made at the plant by ORNL personnel.

The basement of the reactor building (Exhibit 5) is modeled with six cells representing the torus room, the four corner rooms, and the HPCI pump room (Cell 6). The 565 ft elevation of the reactor building (immediately above the basement) is simulated with five cells representing the north, west, south, and east quadrants of the building and the drywell personnel access room. Each floor of the reactor building above the 565 ft elevation (i.e., elevations 593, 621, and 639 ft) is modeled by four cells representing the north, west, south, and east quadrants of that floor. Additionally, the large refueling cask hatchway which provides the vent path from the blowout panels (at the 565, 593, and 621 ft elevations) to the refueling bay is represented by a single cell. The refueling bay and turbine building are each modeled with single cell representations.

Prior to primary containment pressure boundary failure, the major interaction between the primary and secondary containments is heating of the torus room atmosphere due to heat transfer from the outer surface of

BROWNS FERRY UNIT 1 SECONDARY CONTAINMENT MODEL

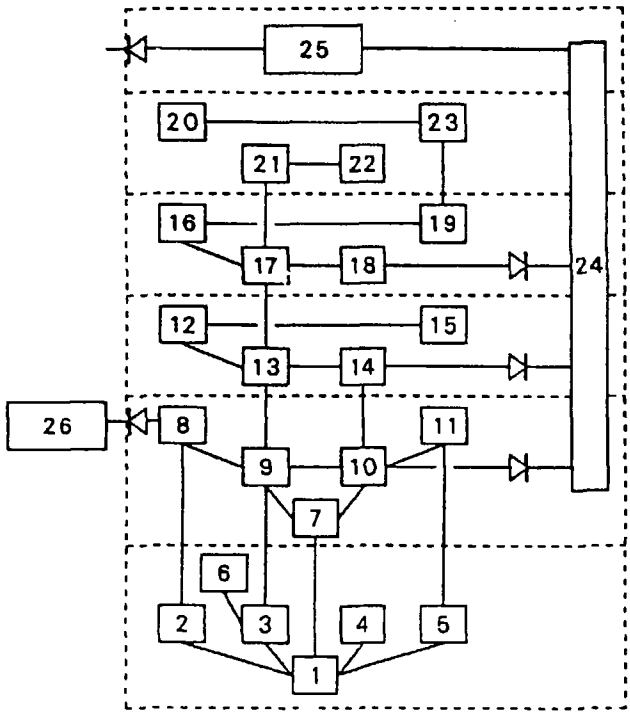

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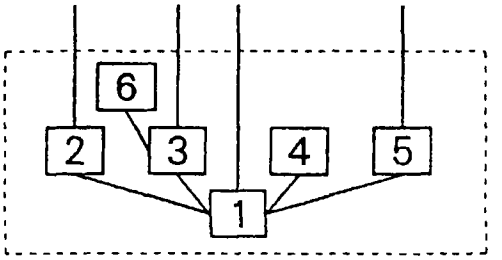
Exhibit 4

Table 1. ORNL 26 Cell Browns Ferry Secondary Containment Model Characteristics

Cell No.	Name	Volume (m^3)	Total area (m^2)		
			Floor	Ceiling	Walls
1	Torus room	5848	1172	1185	2535
2	North corner	775	71	69	346
3	West corner	2784	71	55	340
4	South corner	555	46	46	346
5	East corner	775	71	64	346
6	HPCI Pump rm	1147	144	144	238
7	565 P/A rm	198	58	58	118
8	565 north	2438	342	342	514
9	565 west	2240	276	284	584
10	565 south	1571	197	197	595
11	565 east	1698	235	242	565
12	593 north	1187	121	172	400
13	593 west	2934	321	318	566
14	593 south	1292	133	133	580
15	593 east	1022	117	117	608
16	621 north	526	123	123	226
17	621 west	1556	350	350	363
18	621 south	982	229	229	277
19	621 east	522	110	110	225
20	639 north	3660	158	158	452
21	639 west	3030	423	423	559
22	639 south	1711	239	239	505
23	639 east	525	73	73	402
24	Hatchway	1001	—	—	327
Reactor building total		39977	5080	5131	12017
25	Refueling bay	77730	4202	4756	5709
26	Turbine building	161567	8279	8279	7596

MODEL TOPOLOGY IS DICTATED BY REACTOR BUILDING ARCHITECTURE

REACTOR BUILDING BASEMENT



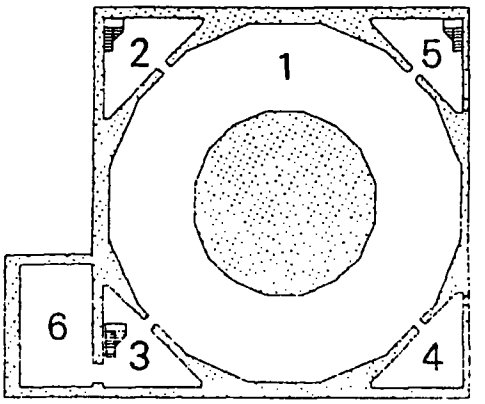


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Exhibit 5

the torus. This effect is captured by representing the torus wall as a steel slab with an appropriate surface area. A time-dependent surface temperature boundary condition is specified on the "inner" surface of the slab, while the outer surface is allowed to convect and radiate energy to the surrounding torus room atmosphere. The inner surface temperature history is taken from the appropriate SCDAP/RELAP5[7] (prior to reactor vessel failure) and CONTAIN[8] (after reactor vessel failure) calculation results.

All blowout panels are modeled as pressure dependent flow areas. The panels are assumed to begin leaking with an area equivalent to 10% of the total panel area, at a pressure differential equivalent to 90% of the design basis pressure differential for the blowout panel. Eighty percent of the total panel area is assumed to be open at the design pressure differential, and all of the blowout panel is assumed to be open at 110% of the design actuation pressure. This modeling approach reflects the results of laboratory tests which indicate that the blowout panel retaining bolts may fail at pressure differentials equivalent to plus or minus 10% of the design value.[9]

Some BWR secondary containments incorporate comprehensive fire protection systems which utilize fused-link water sprinklers for fire suppression. The Browns Ferry plant utilizes fused-link sprinklers which are designed to actuate at 165°F (347 K). The system consists of two 10000 gallon (37.9 m^3) raw service water (RSW) storage tanks (located atop the reactor building), four RSW pumps (which maintain the tank inventory during normal operation), four fire system pumps (one of which is driven by a dedicated diesel), and the sprinkler system. The RSW storage tanks provide a 20000 gallon (75.7 m^3), gravity-fed sprinkler supply reservoir, and no power is required for actuation of the fused-link sprinklers. Additionally, and very importantly, the one diesel-driven pump provides a highly reliable supply of water to sprinklers located in the first two levels of the reactor building.

The Browns Ferry secondary containment fire protection system sprays would be expected to actuate following primary containment blowdown as a result of rising reactor building temperatures. The MELCOR secondary containment model incorporates a detailed representation of the reactor building fire protection system sprays. The model utilizes ten separate spray systems to simulate the spray heads installed in the west and south basement corner rooms, and the four quadrants of the 565 and 593 ft elevations. The spray flow rate characteristics of each of the ten systems were developed from an analysis of the expected performance characteristics for the situation in which (a) only the diesel-driven pump is available, and (b) all spray heads are open on all systems. The results of that analysis indicate that (for the assumed conditions) the 593 ft elevation sprays would function only until the RSW tank inventory is exhausted.

5. THE PARAMETRIC STUDY

The model described in Section 4 was employed to investigate the impact of MK I primary containment failure dynamics on the Browns Ferry secondary containment's response to the initial (first 5 min) drywell blowdown phase of the short-term station blackout severe accident sequence. A test matrix of 15 cases was defined as described in Table 2. The size of the drywell rupture was varied from 0.5 m^2 (775 in^2) down to 0.0005 m^2 (0.78 in^2), while the time for ablation of the hole was varied from 1 s to 60 s. Additionally, various assumptions were made regarding the hydrogen concentration necessary for deflagration (1, 8, and 12 mole %) and the location at which the blowdown enters the secondary containment (torus room, one corner of reactor building second floor, or all zones of reactor building second floor).

The Browns Ferry secondary containment model described in Section 4 was augmented for this study by the addition of a single cell to represent the entire primary containment (drywell and wetwell). The initial primary containment conditions for the analyses were based on Browns Ferry short-term station blackout CONTAIN calculations performed by C. R. Hyman at ORNL.[2] The drywell pressure boundary is assumed to fail at 9.6 h into the accident due to erosion of the drywell shell by molten corium. This failure is modeled by opening a flow path between the primary containment cell and the appropriate cell or cells of the secondary containment model. The drywell conditions at the time of failure are as noted in Table 2, and the secondary containment is assumed to be at 14.7 psia (101 kPa), 80°F (300 K), and 80 % relative humidity at the start of the accident. The MELCOR calculations for each case were conducted for the period from accident initiation until 5 minutes after drywell failure.

6. RESULTS OF THE ANALYSIS

The results of the various case studies are summarized in Table 3. Cases 1, 2, and 3 (0.5 m^2 cases) all result in hydrogen burn-induced secondary containment pressures well in excess of the design value of 17.7 psia. Case 7 produced the lowest pressure response of any of the cases, because no hydrogen deflagrations were predicted to occur during the first 5 minutes after primary containment failure.

Exhibit 6 depicts the results of Cases 3, 4, 5, 8, and 6, in which a 60 s ablation time was assumed, and hole sizes of 0.5, 0.05, 0.005, 0.0028, and 0.0005 m^2 were employed. The abscissa of Exhibit 6 is reactor building elevation, where RB1 is the reactor building basement, PA-RM is the drywell personnel access room (an interior room) on the second floor (565 ft elevation) of the reactor building, RB2 is the remainder of the second floor of the reactor building, RB3, RB4 and RB5 are the third, fourth, and fifth floors of the reactor building, and RF is the refueling bay. The ordinate of Exhibit 6 is the maximum observed

Table 2. Secondary Containment Study Cases[1]

Case	Description
1	0.5 m^2 hole, 1 s ablation time
2	0.5 m^2 hole, 30 s ablation time
3	0.5 m^2 hole, 60 s ablation time
4	0.05 m^2 hole, 60 s ablation time
5	0.005 m^2 hole, 60 s ablation time
6	0.0005 m^2 hole, 60 s ablation time
7	0.0005 m^2 hole, 1 s ablation time
8	0.0028 m^2 hole, 60 s ablation time
9	Case 5 except 1/2 primary containment H_2
10	Case 5 except no burn propagation allowed
11	Case 5 except flame speed fixed at 3.0 m/s
12	Case 5 except blowdown to one corner of second floor of reactor building
13	Case 5 except blowdown into all of second floor of reactor building
14	Case 5 except burn triggers at 1 mole % H_2
15	Case 5 except burn triggers at 12 mole % H_2

[1]Except as noted, all cases assume:

(a) blowdown to torus room,
(b) deflagration trigger at 8 mole % H_2,
(c) 4.1 mole % H_2 for upward flame propagation,
(d) 6 mole % H_2 for horizontal flame propagation,
(e) 9 mole % H_2 for downward flame propagation,
(f) drywell failure at 9.6 h,
(g) primary containment conditions at failure — 81 psia (559 kPa), 381°F (467 K), 53 mole % hydrogen, 1 mole % oxygen, 25 mole % nitrogen, 1 mole % carbon dioxide, and 20 mole % steam

Table 3. Results of Case Studies — Reactor Building Response

Case No.	Peak Basement		Peak Reactor Building[1]	
	Pressure (psia)	Temperature (°F)	Pressure (psia)	Temperature (°F)
1	37.7	3683	27.2	2397
2	32.3	3288	28.9	2286
3	32.1	3445	26.8	2225
4	24.6	3362	18.1	1978
5	20.8	1452	16.5	337
6	22.1	1340	19.6	946
7	14.8	101	14.7	88
8	20.8	137	16.5	783
9	20.7	1352	16.5	330
10	20.9	4404	16.4	662
11	18.0	1275	17.2	895
12	15.6	125	15.7	1292
13	16.3	189	16.8	1295
14	15.3	4756	15.0	836
15	25.9	1929	18.4	659

[1]Excluding basement compartments.

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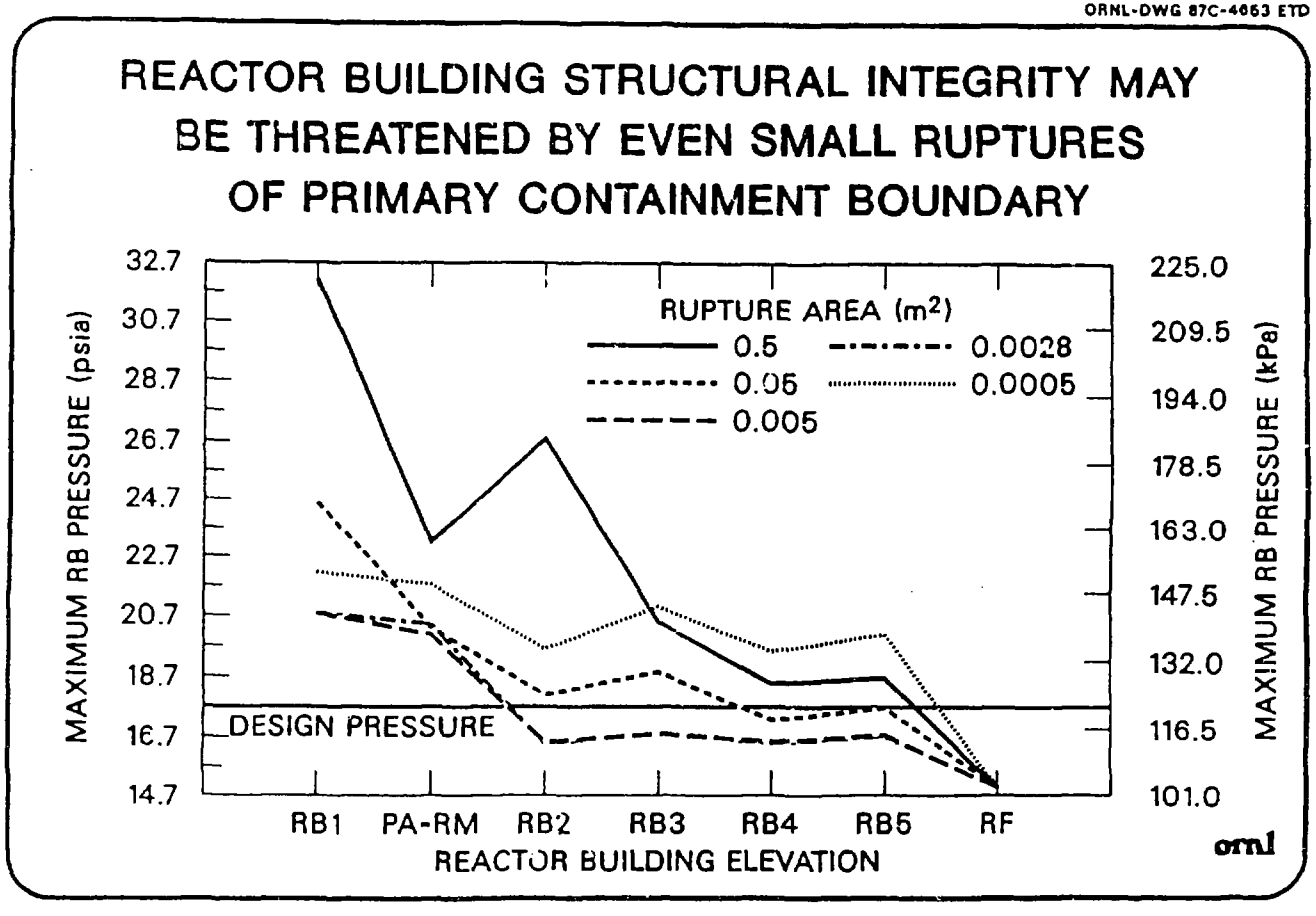

Exhibit 6

pressure on each respective floor of the reactor building during the duration of the 5 minute analysis period. (It should be noted that the pressures plotted in Exhibit 6 and the exhibits to follow may not have occurred at the same instant in time.)

A review of Exhibit 6 reveals that peak reactor building pressures in excess of the design pressure may be produced by a wide range of primary containment hole sizes (0.5, 0.05, and 0.0005 m^2). Interestingly, Exhibit 6 suggests that there may be an optimal hole size which minimizes the deflagration-induced secondary containment pressures. This inference is of little utility, however, since there is currently no available method for predicting the hole size resulting from corium ablation of the drywell liner.

The results of this evaluation indicate that reactor building survivability may be a function of the hydrogen concentration at which deflagrations initiate. This behavior is demonstrated by Exhibit 7, which depicts the results of Cases 5, 14, and 15. Case 5 is a default case in which a 0.005 m^2 hole is assumed to open over 60 s. Deflagration is allowed to occur at hydrogen concentrations of 8 mole %. Case 14 is identical to Case 5, except that deflagrations are allowed to occur at hydrogen concentrations of only 1 mole %. This case is a crude approximation of a situation in which the hydrogen is assumed to burn in a continuous fashion as it enters the torus room. Case 15 is a case in which hydrogen deflagration is delayed until 12 mole % concentrations are reached (as might occur in the absence of auto-ignition or ignition sources). Exhibit 7 demonstrates that, for a given primary containment hole size and ablation time, the survivability of the reactor building may depend on avoidance of delayed hydrogen deflagrations.

Not shown in Exhibit 7, but illustrated by Table 3, is the effect of continuous hydrogen burning (Case 14) on reactor building basement atmosphere temperatures. While continuous burning does reduce the magnitude of deflagration-induced reactor building pressure spikes, this reduction in pressure is coupled with a tremendous increase in thermal loading in the zone in which the burn is occurring. The maximum observed reactor building temperature (4756°F or 2898 K) occurs in conjunction with the continuous burning case. If maintained, temperatures of this magnitude would challenge the integrity of the pressure suppression pool torus and produce degassing of the structural concrete. Neither of these effects were considered in the present analysis.

Exhibit 8 displays the impact that the primary containment blowdown entrance site into the secondary containment has on peak deflagration-induced reactor building pressures. Each of the three cases depicted in Exhibit 8 assumes a 0.005 m^2 primary containment failure hole size and a 60 s ablation time. The lowest peak pressures are seen to result from the case in which the blowdown is assumed to enter the south quadrant of the second floor of the reactor building. Intermediate pressures are generated by the case in which the blowdown is assumed to enter all quadrants of the second floor of the reactor building. The highest pressures are produced by the case in which the primary containment

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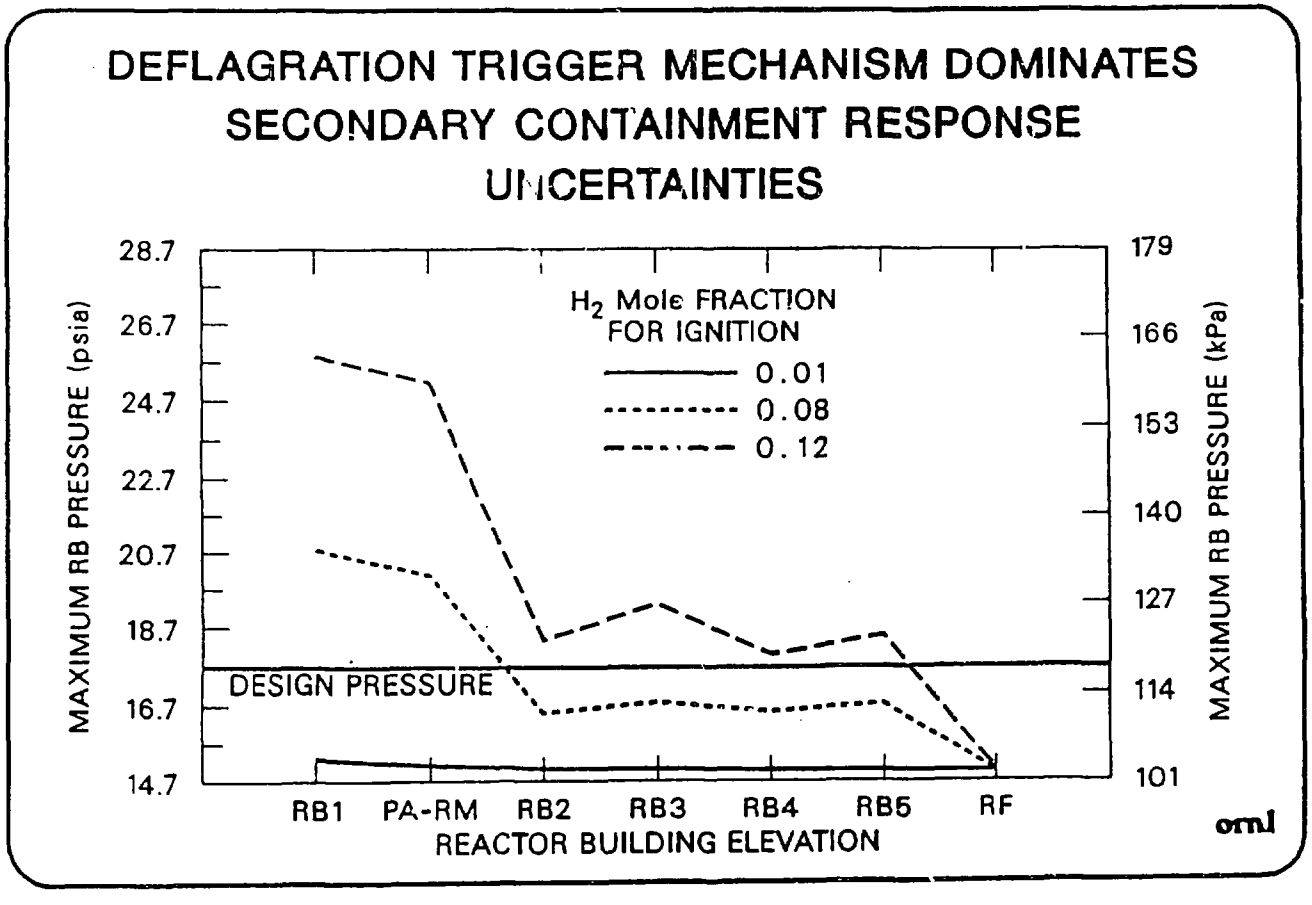

Exhibit 7

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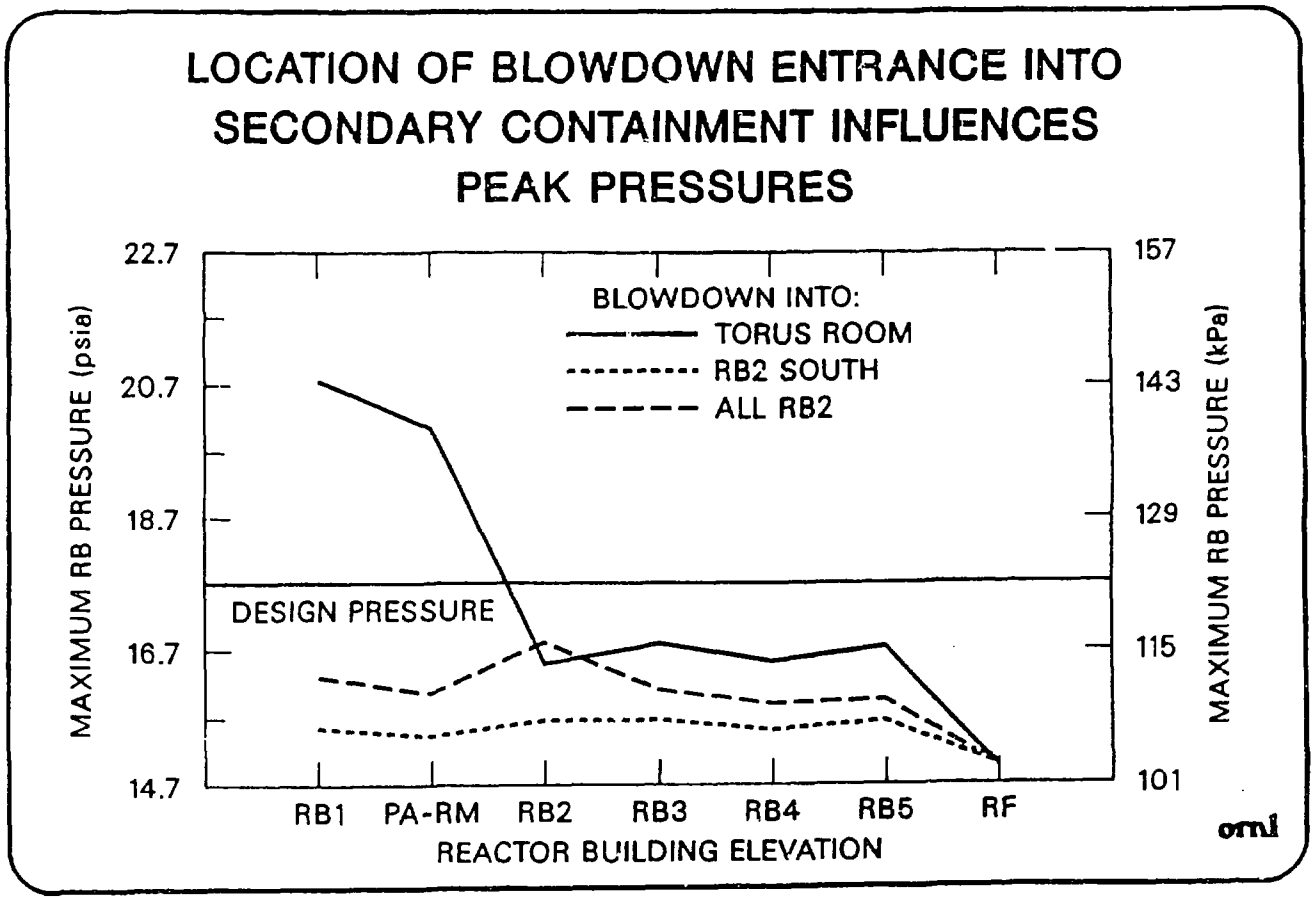

Exhibit 8

blowdown enters the torus room. Maximum pressures in the regions of the reactor building above ground level are below the design dynamic pressure of the concrete walls for all three cases.

7. SECONDARY CONTAINMENT SURVIVABILITY — UNCERTAINTIES

The results of the analysis presented here do not constitute a definitive assessment of reactor building survivability due to a host of unresolved phenomenological and modeling uncertainties. From the phenomenological standpoint, the major uncertainty is probably the characterization of the primary containment failure opening (hole size and ablation time). It must be noted, however, that a wide range of hole sizes result in peak deflagration-induced reactor building pressures significantly in excess of design values.

Secondly, the peak induced reactor building pressures are very sensitive to the assumed minimum hydrogen concentrations necessary for ignition. In the case of primary containment boundary failure due to corium attack of the drywell shell, the gases leaving the drywell would flow over hot core debris and might be heated to auto-ignition conditions (approximately 1000°F or 800 K). A spark source would be required for ignition of the resulting hydrogen mixtures for cases in which auto-ignition does not occur. While power would not be available during the station blackout scenario, the abundance of batteries and capacitive and inductive devices in the secondary containment should provide the necessary spark source. The length of the delay prior to ignition is an important unknown, since long delays would result in hydrogen-rich secondary containment gas concentrations and higher peak pressures when deflagrations do occur.

Modeling uncertainties which have the potential to significantly impact the results of this analysis include model topology issues and uncertainties in MELCOR's deflagration physics models. Previous ORNL secondary containment studies[10] have demonstrated the importance of detailed, architectural-based secondary containment models. The model employed in this study, while more detailed than any previous model employed by ORNL, does treat the reactor building torus room as a single, well mixed cell. The torus cell is the largest cell (volume) in the reactor building model, and approximately 83 lb (37.7 kg) of hydrogen are required to bring the torus room atmosphere up to default (8 mole % hydrogen) deflagration conditions. The intricacies of the communication between the torus room and the basement corner rooms are also not completely captured by this model. Sub-nodalization of this cell would result in more accurate representation of torus room and corner room interaction, and (perhaps) impact peak building pressures due to ignition of smaller quantities of hydrogen.

The second major area of modeling uncertainty which has the capacity to impact the results of this study is associated with MELCOR's hydrogen deflagration physics models. MELCOR employs the basic

deflagration models developed for HECTR[11] and CONTAIN, with the exception that MELCOR's flame speed correlation does not include a term which reduces flame speeds for steam-rich atmospheres. Most of the experimental data upon which the deflagration models are based was generated by small and intermediate scale experiments (less than 10 m^3 compartments). The scaling of flame speed and burn completeness correlations, burn-induced heat flux partitioning fractions (convective versus radiative), and hydrogen concentration ignition thresholds from these small experiments to compartments with volumes of 1000 to 6000 m^3 is subject to many uncertainties.

Finally, the results of this study suggest that primary containment venting might be employed as a solution to the secondary containment survivability issue. One can envision scenarios in which hydrogen would be vented via a "hard" (special purpose) wetwell vent, thereby reducing the amount of hydrogen available for combustion in the secondary containment should the primary containment boundary fail. The vent could (in theory) be closed prior to drywell liner failure to insure that subsequent hydrogen deflagrations in the reactor building basement would not result in torus or vent ducting failure and the opening of a direct vent path from the primary containment to the outside atmosphere. Although we intend to investigate this concept further, it should be noted that (a) corium attack of the drywell shell would not be precluded by containment venting, and (b) recent ORNL studies[2,7] indicate that significant hydrogen might be generated by the core/concrete reaction after the drywell liner is failed.

8. CONCLUSIONS

The impact of BWR MK I primary containment boundary failure dynamics on Browns Ferry's secondary containment integrity has been explored via a parametric study approach. The results of the study indicate that peak hydrogen deflagration-induced reactor building pressures exceed design pressures for a wide range of primary containment hole sizes and ablation times, but that reactor building survivability appears probable for some scenarios. The major uncertainty in the analysis is the assumption regarding the minimum hydrogen concentration necessary for deflagration. Low minimum hydrogen concentrations (an approximation to continuous burning) result in low reactor building peak pressures but extremely high temperatures. The location at which the primary containment blowdown enters the secondary containment influences the peak deflagration-induced reactor building pressures. Primary containment venting for the purpose of reducing the hydrogen inventory available for deflagration in the secondary containment may improve the probability of secondary containment survivability for some scenarios. Additional analysis is underway to explore the potential benefits of this procedure. Finally, existing hydrogen deflagration physics models incorporated in present codes are based on small and intermediate scale experiments. Significant uncertainties are implicit in the application of these models to the simulation of deflagrations in large compartments.

REFERENCES

1. *Browns Ferry Final Safety Analysis Report*, Sect. 5.3, Tennessee Valley Authority.

2. C. R. Hyman, "Multicell CONTAIN Analysis Of BWR MK I Drywell Response To Time-Dependent Vessel Release Of Core Debris," Presented at *Severe Fuel Damage, Containment Loads, and Source Term Research Program Review Meeting*, Silver Spring, Maryland, October 19-23, 1987.

3. *Mark I Containment Severe Accident Analysis*, Chicago Bridge and Iron Company, for the Mark I Owners Group, April 1987.

4. D. A. Powers, "Erosion of Steel Structures by High-Temperature Melts", *Nuclear Science and Engineering*, 88, 357-366 (1984).

5. G. A. Greene, K. R. Perkins, and S. A. Hodge, "Impact of Core-Concrete Interactions in the Mark I Containment Drywell On Containment Integrity and Failure Of The Drywell Liner", IAEA-SM-281/36, *International Symposium on Source Term Evaluation For Accident Conditions*, Columbus, Ohio, 28 October — 1 November, 1985.

6. F. E. Haskin, et al., "Development and Status of MELCOR", SAND86-2115C, Sandia National Laboratories, presented at the *Fourteenth Water Reactor Safety Information Meeting*, National Bureau of Standards, Gaithersburg, Maryland, October, 1986

7. L. J. Ott, "Advanced Severe Accident Response Models for BWR Application," Oak Ridge National Laboratory, presented at the *Fifteenth Water Reactor Safety Information Meeting*, National Bureau of Standards, Gaithersburg, Maryland, October 1987.

8. K. D. Bergeron, et al., *User's Manual for CONTAIN 1.0, A Computer Code for Severe Nuclear Reactor Accident Containment Analysis*, NUREG/CR-4085, Sandia National Laboratories, May, 1985

9. *Browns Ferry Final Safety Analysis Report*, p. 5.3-23

10. S. R. Greene, "The Role of BWR MK I Secondary Containments In Severe Accident Mitigation," Oak Ridge National Laboratory, presented at the *Fourteenth Water Reactor Safety Information Meeting*, National Bureau of Standards, Gaithersburg, Maryland, October, 1986.

11. S. E. Dingman, et al., *HECTR Version 1.5 User's Manual*, NUREG/CR-4507, SAND86-0101, Sandia National Laboratories, April, 1986.

Satorius, Mark

From: Mitlyng, Viktoria
Sent: Thursday, March 17, 2011 9:15 AM
To: All R3 Users
Subject: Updated talking points on Japan earth quake issues
Attachments: japan talking point 3-16.docx

Please do not print and distribute the attached document in written form. The talking points are intended for oral communication only.

Thank you.

Vika

Viktoria Mitlyng
Office of Public Affairs
US Nuclear Regulatory Commission
Region III
Lisle, IL 60532
Tel 630/829-9662
Fax 630/515-1026
e-mail: viktoria.mitlyng@nrc.gov

W/179

Quake_TP_3_16.docx

OPA

TALKING POINTS

JAPAN NUCLEAR SITUATION

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

- Based on calculations performed by NRC experts, we now believe that it is appropriate for U.S. residents within 50 miles of the Fukushima reactors to evacuate. Our recommendation is based on NRC guidelines for public safety that would be used in the United States under similar circumstances.

- Given the results of the monitoring and distance between Japan and Hawaii, Alaska, U.S. Pacific Territories and the U.S. West Coast, the NRC expects the U.S. to avoid any harmful levels of radioactivity. The NRC is aware of various internet postings depicting modeled radiation plumes for the ongoing events at the nuclear power plants in Japan. All of the models the NRC has seen are based on generic assumptions regarding the potential radiation release from the plants and as such are unable to predict actual radiation levels away from the site. The NRC is working closely with our federal partners to monitor radiation releases from the Japanese nuclear power plants.

- The NRC continues to believe, based on all available information, that the type and design of the Japanese reactors, combined with how events have unfolded, will prevent radiation at harmful levels from reaching U.S. territory.

- In accordance with established protocols, U.S. Customs and Border Protection (CBP) employs several types of radiation detection equipment in its operations at both air and sea ports, and uses this equipment, along with specific operational protocols, to resolve any security or safety risks that are identified with inbound travelers and cargo. Out of an abundance of caution, CBP has issued field guidance reiterating its operational protocols and directing field personnel to specifically monitor maritime and air traffic from Japan. CBP will continue to evaluate the potential risks posed by radiation contamination on inbound travelers and cargo and will adjust its detection and response protocols, in coordination with its interagency partners, as developments warrant.

- The Japanese government has formally asked for U.S. assistance in responding to nuclear power plant cooling issues triggered by an earthquake and tsunami on March 11. The NRC has eleven staff on the ground in Japan as part of the USAID team.

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

- The NRC is always looking to learn information that can be applied to U.S. reactors and we will analyze the information that comes from this incident.

- The NRC is working with other U.S. agencies to monitor radioactive releases from Japan and to predict their path.

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

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

From: Champ, Billie
To: Commission E-Reader Distribution; E-Reader Distribution
Subject: COMMISSION E-READER...THURSDAY, MARCH 17, 2011
Date: Thursday, March 17, 2011 12:10:42 PM
Attachments: Tab A 03-16-11 Rep. Blumenauer.pdf

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~~**Some of the information contained in the Reader is not publicly available.**~~
~~**If there are any questions, please contact SECY.**~~

READING FILE

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March 17, 2011

INCOMING CORRESPONDENCE

Tab "A" 03/16/11 -- Letter from Rep. Earl Blumenauer, concerns potential risk to U.S. West Coast communities from the explosions and release of radiation from the Fukushima Daiichi nuclear facility in Japan.

W/180

EARL BLUMENAUER
THIRD DISTRICT, OREGON

COMMITTEE ON WAYS AND MEANS
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March 16, 2011

Lisa Jackson
Administrator
Environmental Protection Agency
US EPA Ariel Rios Building
1200 Pennsylvania Ave, NW
Washington, DC 20004

Gregory Jaczko
Chairman
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Dear Administrator Jackson and Chairman Jaczko,

I write to inquire about the potential risk to U.S. West Coast communities from the explosions and release of radiation from the Fukushima Daiichi nuclear facility in Japan. In a region that is already breathing air pollution from China, my constituents are concerned about radiation contamination from the facility reaching the West Coast.

While a number of experts have indicated that contamination in the U.S. as a result of the Japanese catastrophe is unlikely, I would like to better understand the agencies' contingency plans and your plan for disseminating information to concerned citizens. At your earliest convenience, please respond to me with the following information:

- What is the U.S. Government doing to monitor radiation levels over the Pacific?
- What steps is the Government taking to plan for a scenario in which radiation is elevated to unsafe levels?
- How does the Government plan to provide information about this potential risk to citizens?

Thank you for your attention to this request. I look forward to being able to assure my constituents that the U.S. Government has a plan and to be able to tell them where they can find more information about the situation.

Sincerely,

Earl Blumenauer

Earl Blumenauer
Member of Congress

PRINTED ON RECYCLED PAPER

From:	Champ, Billie
To:	Commission E-Reader Distribution; E-Reader Distribution
Subject:	COMMISSION E-READER...TUESDAY, MARCH 15, 2011
Date:	Tuesday, March 15, 2011 12:12:32 PM
Attachments:	Tab A 03-11-11 Rep. Issa.pdf

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March 15, 2011

INCOMING CORRESPONDENCE

Tab "A" 03/11/11 -- Letter from Rep. Darrell Issa, concerns the Yucca Mountain Project.

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Congress of the United States
House of Representatives

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March 11, 2011

The Honorable Gregory Jaczko
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Chairman Jaczko:

The Committee on Oversight and Government Reform is conducting an investigation into the termination of the Yucca Mountain Project. In particular, the recent actions of the Nuclear Regulatory Commission (NRC) in connection with the Department of Energy's motion to withdraw the license application require further explanation.

The Nuclear Waste Policy Act of 1982 (NWPA), established the authority of the federal government, specifically the U.S. Department of Energy (DOE), to site, construct and operate a permanent geologic repository for the nation's spent nuclear fuel (SNF) and high level waste (HLW). In 1987, Congress amended the NWPA, designating Yucca Mountain in Nevada as the only site available for consideration.

In 2002, pursuant to the process defined by the NWPA, Congress and the President approved the recommendation of the Secretary of Energy to construct a repository at Yucca Mountain. In June 2008, DOE submitted a license application to the NRC to construct and operate the proposed repository. Yet, your actions and those of current Energy Secretary Steven Chu appear to undermine congressional intent.

The U.S. Court of Appeals for the D.C. Circuit stated in a 2004 opinion that "Congress has settled the matter, and we, no less than the parties, are bound by its decision."[1] On March 3, 2010, however, the Department of Energy filed a motion to withdraw the license application with prejudice in an attempt to ensure the Yucca Mountain Project could never be resurrected.[2] Affected parties challenged the legality of this action, and in June 2010, the NRC's Atomic Safety and Licensing Board (ASLB) unanimously denied DOE's motion, citing a lack of authority.[3]

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[1] *See Nuclear Energy Inst., Inc. v. Envtl. Prot. Agency*, 373 F.3d 1251, 1302 (D.C. Cir. 2004).
[2] U.S. Department of Energy's Motion to Withdraw (Mar. 3, 2010), *available at* http://www.energy.gov/news/8721.htm.
[3] ASLB Order (Granting Intervention to Petitioners and Denying Withdrawal Motion) (Jun. 29, 2010).

Eight months later, the Commission has still not decided whether to review the ASLB's decision. It has come to this Committee's attention that Commissioners William Ostendorff, Kristine Svinicki, and William Magwood filed their "preliminary" votes with the Secretary of the Commission last summer.[4] Although you filed your vote last summer as well, you delayed the resolution of this matter by later withdrawing your vote.[5] You proceeded to continue solitary deliberations until after the start of the new fiscal year and resubmitted your vote on October 29, 2010.[6] Despite having all preliminary votes submitted more than four months ago, and the enormous significance of the Commission's decision in this matter, you have failed to schedule an affirmation session to ratify those votes. Nevertheless, until the affirmation session is held, the ASLB's determination that the application cannot be withdrawn continues to stand.

While delaying a final vote on the ASLB decision, you instructed staff to proceed with an "orderly closure" of the NRC's license application review.[7] NRC staff are following your instruction "to continue [the staff's] activities on the Yucca Mountain license application" in accordance with the "Commission's decisions on the fiscal year 2011 budget request" during the Continuing Resolution, which, by your interpretation, dictates termination of the review.[8] In response to congressional and your fellow commissioners' questions about your instruction to the NRC staff,[9] you have stated that neither the FY 2010 Appropriations Act and associated committee reports nor the FY 2011 Continuing Resolution provided you with any express direction on how to expend taxpayer dollars on Yucca Mountain activities in FY 2011.[10] Your fellow commissioners[11] and a former NRC Chairman[12] have expressed their strong disagreement with this position publicly.

If you insist the staff continue down this path, I would expect the "orderly closure" you requested to include a complete accounting of the staff's work to date. Part of this effort would logically be the public release of Volume III of the Safety Evaluation Report, which contains the conclusions of the NRC staff regarding the technical merits of

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[4] Letter from Comm'r Kristine Svinicki to Senator James Inhofe (Nov. 4, 2010); letter from Comm'r William Ostendorff to Senator James Inhofe (Nov. 4, 2010); letter from Comm'r William Magwood to Senator James Inhofe (Nov. 5, 2010).
[5] Letter from Chairman Gregory Jaczko to Senator James Inhofe (Nov. 5, 2010).
[6] *Id.*
[7] *See* Memorandum from Comm'r Ostendorff to Chairman Jaczko *et al.*, "Disagreement with Staff Budget Guidance Under Fiscal Year 2011 Continuing Resolution" (Oct. 8, 2010) (hereinafter Ostendorff Memo).
[8] *Id.*; Memo from J.E. Dyer, Chief Financial Officer, and R.W. Borchardt, Executive Director for Operations, "Guidance Under a Fiscal Year 2011 Continuing Resolution" (Oct. 4, 2010).
[9] Letter from Rep. Jim Sensenbrenner to Chairman Gregory Jaczko (Oct. 13, 2010); letter from Comm'r Kristine Svinicki to Rep. Jim Sensenbrenner (Nov. 1, 2010); Ostendorff Memo, *supra* note 7.
[10] Letter from Chairman Gregory Jaczko to Rep. Joe Barton (Oct. 27, 2010).
[11] Letter from Comm'r Kristine Svinicki to Rep. Joe Barton (Nov. 1, 2010); letter from Comm'r William Ostendorff to Rep. Doc Hastings (Oct. 27, 2010).
[12] Open Letter to Journalists from Dale E. Klein, former Chairman, Nuclear Regulatory Commission (Oct. 29, 2010), *available at* http://www.nucleartownhall.com/blog/ex-nrc-chairman-klein-rebuffs-jaczko-yucca-shut-down-alibi/.

the license application. Thus far, the NRC has only released a redacted, pre-decisional version of the document in response to a Freedom of Information Act (FOIA) request.[13] The document's pre-decisional state directly contradicts Commissioner Ostendorff's October 27, 2010, letter informing Rep. Doc Hastings "on July 15, 2010, Volume III was transmitted to the Director.... [f]or concurrence and authorization to publish."[14] Furthermore, in the words of the ASLB, none of the evidence provided "comports with the Staff's characterization of SER Volume 3 being a preliminary draft."[15]

Shortly after taking office, President Obama pledged that "the public must be able to trust the science and scientific process informing public policy decisions."[16] Likewise, as Chairman, you have stressed the importance of "conduct[ing] the public's work in an open and transparent manner."[17] Unfortunately, your actions surrounding the termination of the Yucca Mountain Project fail to live up to this pledge.

In order to assist the Committee with its investigation, please provide the following information and documents:

1. A timeline of significant events related to the Commission's review of the ASLB's decision on DOE's motion to withdraw the license application, including but not limited to the following:
    a. Filing of each Commissioner's vote.
    b. Withdrawal of any Commissioner's vote.
    c. Active deliberation or discussions between Commissioners or their staff.

2. Documents and communications, including e-mails, relating to the Commission's review of the ASLB's decision on DOE's motion to withdraw the license application.
3. Documents and communications, including e-mails, relating to reasons for the delay between the filing of the final Commissioner's vote and the scheduling of the affirmation session.

4. A timeline of all significant events related to the "orderly closure" of the High-Level Waste Program and the use of Nuclear Waste Fund resources

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[13] Response to Freedom of Information Act / Privacy Act Request, No. 2011-0015 (Feb. 14, 2011), *available at* http://www.nrc.gov/reading-rm/adams/web-based.html (Accession no. ML110480651).
[14] Letter from Comm'r William Ostendorff to Rep. Doc Hastings (Oct. 27, 2010).
[15] ASLB Order (Directing NRC Staff's Show Cause) (Feb. 25, 2011).
[16] President Barack Obama, *Remarks on Signing of Stem Cell Executive Order and Scientific Integrity Presidential Memorandum* (Mar. 9, 2009), *available at* http://www.whitehouse.gov/the_press_office/remarks-of-the-president-as-prepared-for-delivery-signing-of-stem-cell-executive-order-and-scientific-integrity-presidential-memorandum/.
[17] Prepared Remarks, The Honorable Gregory Jaczko, Chairman, U.S. Nuclear Regulatory Commission, "A Firm Foundation, A Strong Regulatory Future," (Mar. 9, 2010) *available at* http://adamswebsearch2.nrc.gov/idmws/DocContent.dll?library=PU_ADAMS^pbntad01&LogonID=3d46d1e295e9ff82d1bd118bda083450&id=100680285.

under the Continuing Resolution, including but not limited to the following:

a. Communication to or among the Commissioners or their respective staffs.
b. Internal communication to NRC staff.

5. Documents and communications, including e-mails, relating to all significant dates concerning the "orderly closure" of the High-Level Waste Program and the use of Nuclear Waste Fund resources under the Continuing Resolution.

6. Documents and communications, including e-mails, exchanged among or originated by the Commissioners, their respective staffs, and Commission staff relating to the funding of the High-Level Waste Program in FY2011. This request includes any reviews or recommendations provided by the Office of the General Counsel.

7. Documents and communications, including e-mails, exchanged among or originated by the Commissioners, their respective staffs, and Commission staff relating to the release of Volume III of the SER

8. A statement by each individual responsible for reviewing and signing Volume III of the SER specifying whether he/she received the document for final concurrence and whether and when he/she gave that concurrence.

9. Documents and communications, including e-mails, related to the decision to develop a report separate from the SER to document the NRC staff's technical review activities completed to date.

10. Volume III of the SER, in unredacted form.

The Committee on Oversight and Government Reform is the principal oversight committee of the House of Representatives and may at "any time" investigate "any matter" as set forth in House Rule X.

The Committee requests that the NRC produce Volume III of the SER in its unredacted, electronic form no later than noon on March 23, 2011. We ask that you provide the remaining requested information and documents as soon as possible, but no later than 5:00 p.m. on April 1, 2011. When producing documents to the Committee, please deliver production sets to the Majority Staff in Room 2157 of the Rayburn House Office Building and the Minority Staff in Room 2471 of the Rayburn House Office Building. The Committee prefers, if possible, to receive all documents in electronic format. An attachment to this letter provides additional information about responding to the Committee's request.

If you have any questions about this request, please contact John Ohly of the Committee Staff at (202) 225-5074. Thank you for your attention to this matter.

Sincerely,

Darrell Issa
Chairman

Enclosure

cc: The Honorable Elijah E. Cummings, Ranking Minority Member

The Honorable William C. Ostendorff, Commissioner
U.S. Nuclear Regulatory Commission

The Honorable George Apostolakis, Commissioner
U.S. Nuclear Regulatory Commission

The Honorable Kristine Svinicki, Commissioner
U.S. Nuclear Regulatory Commission

The Honorable William D. Magwood, IV, Commissioner
U.S. Nuclear Regulatory Commission

DARRELL E. ISSA, CALIFORNIA
CHAIRMAN

ELIJAH E. CUMMINGS, MARYLAND
RANKING MINORITY MEMBER

ONE HUNDRED TWELFTH CONGRESS

Congress of the United States

House of Representatives

COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM

2157 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515-6143

Majority (202) 225-5074
Minority (202) 225-5051

Responding to Committee Document Requests

1. In complying with this request, you should produce all responsive documents that are in your possession, custody, or control, whether held by you or your past or present agents, employees, and representatives acting on your behalf. You should also produce documents that you have a legal right to obtain, that you have a right to copy or to which you have access, as well as documents that you have placed in the temporary possession, custody, or control of any third party. Requested records, documents, data or information should not be destroyed, modified, removed, transferred or otherwise made inaccessible to the Committee.

2. In the event that any entity, organization or individual denoted in this request has been, or is also known by any other name than that herein denoted, the request shall be read also to include that alternative identification.

3. The Committee's preference is to receive documents in electronic form (i.e., CD, memory stick, or thumb drive) in lieu of paper productions.

4. Documents produced in electronic format should also be organized, identified, and indexed electronically.

5. Electronic document productions should be prepared according to the following standards:

   (a) The production should consist of single page Tagged Image File ("TIF"), files accompanied by a Concordance-format load file, an Opticon reference file, and a file defining the fields and character lengths of the load file.

   (b) Document numbers in the load file should match document Bates numbers and TIF file names.

   (c) If the production is completed through a series of multiple partial productions, field names and file order in all load files should match.

6. Documents produced to the Committee should include an index describing the contents of the production. To the extent more than one CD, hard drive, memory stick, thumb drive, box or folder is produced, each CD, hard drive, memory stick, thumb drive, box or folder should contain an index describing its contents.

7. Documents produced in response to this request shall be produced together with copies of file labels, dividers or identifying markers with which they were associated when they were requested.

8. When you produce documents, you should identify the paragraph in the Committee's request to which the documents respond.

9. It shall not be a basis for refusal to produce documents that any other person or entity also possesses non-identical or identical copies of the same documents.

10. If any of the requested information is only reasonably available in machine-readable form (such as on a computer server, hard drive, or computer backup tape), you should consult with the Committee staff to determine the appropriate format in which to produce the information.

11. If compliance with the request cannot be made in full, compliance shall be made to the extent possible and shall include an explanation of why full compliance is not possible.

12. In the event that a document is withheld on the basis of privilege, provide a privilege log containing the following information concerning any such document: (a) the privilege asserted; (b) the type of document; (c) the general subject matter; (d) the date, author and addressee; and (e) the relationship of the author and addressee to each other.

13. If any document responsive to this request was, but no longer is, in your possession, custody, or control, identify the document (stating its date, author, subject and recipients) and explain the circumstances under which the document ceased to be in your possession, custody, or control.

14. If a date or other descriptive detail set forth in this request referring to a document is inaccurate, but the actual date or other descriptive detail is known to you or is otherwise apparent from the context of the request, you should produce all documents which would be responsive as if the date or other descriptive detail were correct.

15. The time period covered by this request is included in the attached request. To the extent a time period is not specified, produce relevant documents from January 1, 2009 to the present.

16. This request is continuing in nature and applies to any newly-discovered information. Any record, document, compilation of data or information, not produced because it has not been located or discovered by the return date, shall be produced immediately upon subsequent location or discovery.

17. All documents shall be Bates-stamped sequentially and produced sequentially.

18. Two sets of documents shall be delivered, one set to the Majority Staff and one set to the Minority Staff. When documents are produced to the Committee, production sets shall be delivered to the Majority Staff in Room 2157of the Rayburn House Office Building and the Minority Staff in Room 2471of the Rayburn House Office Building.

19. Upon completion of the document production, you should submit a written certification, signed by you or your counsel, stating that: (1) a diligent search has been completed of all documents in your possession, custody, or control which reasonably could contain responsive documents; and (2) all documents located during the search that are responsive have been produced to the Committee.

Definitions

1. The term "document" means any written, recorded, or graphic matter of any nature whatsoever, regardless of how recorded, and whether original or copy, including, but not limited to, the following: memoranda, reports, expense reports, books, manuals, instructions, financial reports, working papers, records, notes, letters, notices, confirmations, telegrams, receipts, appraisals, pamphlets, magazines, newspapers, prospectuses, inter-office and intra-office communications, electronic mail (e-mail), contracts, cables, notations of any type of conversation, telephone call, meeting or other communication, bulletins, printed matter, computer printouts, teletypes, invoices, transcripts, diaries, analyses, returns, summaries, minutes, bills, accounts, estimates, projections, comparisons, messages, correspondence, press releases, circulars, financial statements, reviews, opinions, offers, studies and investigations, questionnaires and surveys, and work sheets (and all drafts, preliminary versions, alterations, modifications, revisions, changes, and amendments of any of the foregoing, as well as any attachments or appendices thereto), and graphic or oral records or representations of any kind (including without limitation, photographs, charts, graphs, microfiche, microfilm, videotape, recordings and motion pictures), and electronic, mechanical, and electric records or representations of any kind (including, without limitation, tapes, cassettes, disks, and recordings) and other written, printed, typed, or other graphic or recorded matter of any kind or nature, however produced or reproduced, and whether preserved in writing, film, tape, disk, videotape or otherwise. A document bearing any notation not a part of the original text is to be considered a separate document. A draft or non-identical copy is a separate document within the meaning of this term.

2. The term "communication" means each manner or means of disclosure or exchange of information, regardless of means utilized, whether oral, electronic, by document or otherwise, and whether in a meeting, by telephone, facsimile, email, regular mail, telexes, releases, or otherwise.

3. The terms "and" and "or" shall be construed broadly and either conjunctively or disjunctively to bring within the scope of this request any information which might

otherwise be construed to be outside its scope. The singular includes plural number, and vice versa. The masculine includes the feminine and neuter genders.

4. The terms "person" or "persons" mean natural persons, firms, partnerships, associations, corporations, subsidiaries, divisions, departments, joint ventures, proprietorships, syndicates, or other legal, business or government entities, and all subsidiaries, affiliates, divisions, departments, branches, or other units thereof.

5. The term "identify," when used in a question about individuals, means to provide the following information: (a) the individual's complete name and title; and (b) the individual's business address and phone number.

6. The term "referring or relating," with respect to any given subject, means anything that constitutes, contains, embodies, reflects, identifies, states, refers to, deals with or is pertinent to that subject in any manner whatsoever.

Bagchi, Goutam

From: Bagchi, Goutam
Sent: Thursday, March 17, 2011 10:53 AM
To: NRO_DSER Distribution
Cc: Kammerer, Annie; Burnell, Scott; Cullingford, Michael; Ali, Syed; Hogan, Rosemary
Subject: Some Seismic Safety Criteria of Japan Nuclear Safety Commission (NSC)
Attachments: JapanNSCSitingRGL-ST-I_0.pdf; JapanNSCSafetyClassRGL-DS-I_01.pdf; JapanNSCseismicDesignRGL-DS-I_02.pdf

This information is for Official Use Only

Dear Colleagues,

Those of you that are interested in getting more technical information may want to browse through some of the attached files of regulatory guides (RG) published by the Japan Nuclear Safety Commission (NSC). In this message I am trying to present what I gleaned from the RGs. Please note that the front pages of the RGs may show the original publication dates, such as 1978 etc., inside pages should show the latest revision dates – 2006, 2009 etc.

- **Siting Review Criteria**: Focuses on proximity to population zone and potential radiation impact, not site suitability from natural hazards (hydrology, meteorology or Seismology stand point)
- **Safety Classification:** Divided into classes 1, 2 and 3. Required function for Class 3 are) Functions to mitigate reactor pressure increase
  2) Functions to suppress reactor power increase
  3) Functions to make up reactor coolant
  Safety Class 3 design philosophy, "Class 3: Ensure and maintain reliability equivalent to or higher than that of ordinary industrial facilities"
- Seismic Design: Safety Class 3 SSCs are designed to static forces with varying numbers of safety factors from 3 to 1.0

Japan's seismic design of structures for resistance ground vibration is very robust -2007 July event at Kashiwazaki shows this. Vibratory ground motion and tsunami from large earthquakes are relatively frequent events in Japan and they occur simultaneously. At this point I am not clear as to the extent to which the older vintage plants considered the combined effects. I do not know what back fits were implemented at the Fukushima like plants when the NSC upgraded its seismic criteria in 2006 (?)

W/181

Another factor seems to be qualification of electrical and mechanical equipment in mild and harsh environments, as is required under 10 CFR 50.49. At Fukushima the electrical safety systems (cables?) became wet ad did not work even when the diesel generator worked for about an hour.

There are very significant differences in the way reactor oversight is conducted – review of maintenance and in-service inspection of safety related SSCs (10 CFR 50.55a imposes ASME Code criteria to ISI).

Please forgive me, I messed up the formatting in the bulleted portion of the text above. Regards,

Thank you,
Goutam Bagchi

NSC

NSCRG: L-ST-I.0

Regulatory Guide for Reviewing Nuclear Reactor Site Evaluation and Application Criteria

Published in May 1964

The Nuclear Safety Commission of Japan

Revision History
Latest Revision on March 27, 1989 by the Nuclear Safety Commission

Disclaimer
This is an unofficial translation of the official Nuclear Safety Commission Regulatory Guide for the benefit of interested readers. For all questions regarding meaning and phrasing, please refer to the official version in Japanese.

Revision History

Revised on March 27, 1989, by the Nuclear Safety Commission

Authorized on May 27, 1964, by the then Atomic Energy Commission

In April 1958, the Atomic Energy Commission established the Specialty Subcommittee on Reactor Safety Standards to enact scientific and technical standards for the safety of reactor facilities. On November 2, 1963, the Committee submitted a report regarding the "Regulatory Guide for Nuclear Reactor Siting Evaluation and Application Criteria" as a preliminary stage before establishing the standards for nuclear reactors to be placed on land.

The Atomic Energy Commission studied the report and specified the "Regulatory Guide for Nuclear Reactor Siting Evaluation and Application Criteria". as in the Separate Sheet 1.

The Commission also specified tentative criteria regarding the radiation dosage, etc., as in the Separate Sheet 2, which are required in application of this Guideline.

Guideline for Nuclear Reactor Siting Evaluation

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2.	Guideline for Site Review	1
3.	Application	2
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A safety review is conducted prior to the establishment of a nuclear reactor to be placed on land.

This Guideline is used in this safety review by the Council on Reactor safety Examination to examine the adequacy of the nuclear reactor siting conditions in relation to rare accident.

1. Basic Concept

1.1 Fundamental Siting Conditions

Regardless of the establishment location, Nuclear reactors are required to be designed, constructed operated and maintained to prevent rare accidents. The following site conditions are, however, required in principle to ensure public safety in case of rare accident:

(1) There have as yet been no event liable to induce large accident and no such event is expected to occur in the future. There have also been very few events deemed liable to expand disaster;

(2) In relation to their safety guarding facilities, nuclear reactors shall be located at a sufficient distance from the public; and

(3) The environment of the nuclear reactor site including its immediate proximity shall be such that appropriate measures for the public can be implemented as required.

1.2 Basic Goal

Based on a policy of ensuring public safety even in case of accident and promoting a sound nuclear development, this Guideline provides the following three basic goals:

a) Not to cause radiation damage to the neighboring public, even when assuming a serious accident (hereinafter termed "Major Accident")that is deemed to have a possibility of occurrence under the worst scenario from technological point of view, by considering the events in the site vicinity, the characteristics of the nuclear reactor and related safety guarding facilities.

b) And to prevent significant radiation hazard to the neighboring public when an accident (hereinafter termed "Hypothetical Accident"), which exceeds the Major Accident level and is not expected to occur from technological point of view. is hypothesized, for example, by hypothesizing that some of safety guard facilities which are assumed to be effective in postulating a Major Accident do not function and corresponding release of radioactive materials occurs.

c) In case of a Hypothetical Accident , effect on the collective dose shall be sufficiently small

2. Guideline for Site Review

When examining the adequacy of the site conditions, it is necessary to ensure that the following three conditions are satisfied at least in order to achieve the previously described basic goals.

2. 1 Regarding the area surrounding a nuclear reactor, within "the range in a specified distance" from the nuclear reactor shall be the non-residential area. Here, the range of specified distance means a range of distance where person may be exposed to radiation damage if they remain at the point of that distance under a Major Accident, and "non-residential area" means the area where the public do not reside in principle.

2.2 The region within the range in specified distance from the nuclear reactor and outside the

non-residential area shall be the low population zone. Here, "the range in specified distance" means that wherein the public may be exposed to significant radiation hazard in the case of a Hypothetical Accident unless certain countermeasures are provided. "The low population zone" means the region where appropriate countermeasures can be provided to prevent significant radiation hazard (for instance, a low population density zone).

2.3 The nuclear reactor site shall be separated by specified distance from the dense population zone. Here, the specified distance means the distance where the cumulative value of whole-body dose in case of a hypothetical accident shall be small enough to be deemed acceptable based on the viewpoint of collective dose.

3. Application

This Guideline shall be applied for the siting review of nuclear reactors having l0, 000 KW or larger thermal output. In case of nuclear reactors under l0, 000 KW thermal output, this Guideline shall be used as a reference in their siting review.

Tentative Judging Criteria to apply the Regulatory Guide for Nuclear Reactor Site Evaluation and Application Criteria

The criteria shall be used when the Guideline on the Separate Sheet 1 is applied by the Council on Reactor Safety Examination to review the safety of nuclear reactors to be placed on land.

1. The following dosage values shall be applied as the criteria in judging "the range with the specified distance" in Guideline 2.1.

   - For Thyroid (child): 1.5 Sv
   - For Whole body: 0.25 Sv

2. The following dosage values shall be considered as the general criteria in judging "the range in specified distance" in Guideline 2.2.
   - For Thyroid (adult): 3 Sv
   - For Whole body: 0.25 Sv
3. The criteria in judging "to be separated by specified distance" in Guideline 2.3 shall be referred to overseas examples (for instance, for 20,000man-Sv).

Supplement:

(i) The criteria above are provided from the administrative aspect with comparison and investigation on the currently available information regarding the radiation effect, types and kinds of the diffusion of radioactive materials from nuclear reactors in accidents and overseas examples of these kinds, and shall be reviewed accordingly by promoting research in this field further in Japan and considering international trend as well, since the biological effect of radiation and collective dose remain especially somewhat unclear at this time,

(ii) The criteria above are provided based on a concept different from that for the emergency measures taken in an actual nuclear reactor accident (for example, dose in relation to food & drink intake limitation and evacuation measures, etc.)

(iii) The criteria above are used for the safety review prior to nuclear reactor establishment to examine the adequacy of the siting conditions in relation to a rare accident. The criteria for judgment regarding prevention of public radiation damage in the normal reactor operation are provided in the Law for the Regulation of Nuclear Source Materials, Nuclear Fuel Material and Nuclear Reactors (No. 166, in1957) and the Prime Ministers Ordinance and the Notification of the Science and Technology Agency based on this law.

(iv) The criteria 1 and 2 above are provided for nuclear reactors which use ordinary uranium fuel. It is necessary to consider different criteria when another criteria for thyroid and whole body are considered important from the damage aspect.

NSC

NSCRG: L-DS-I.01
Regulatory Guide for Reviewing Classification of Importance of Safety Function of Light Water Nuclear Power Reactor Facilities

Published in August 1990

The Nuclear Safety Commission of Japan

Revision History
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Disclaimer
This is an unofficial translation of the official Nuclear Safety Commission Regulatory Guide for the benefit of interested readers. For all questions regarding meaning and phrasing, please refer to the official version in Japanese.

Revision History

Revised on March 9th, 2009
Revised on September 19, 2006
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Regulatory Guide for Reviewing Classification of Importance of Safety Function for Light Water Nuclear Power Reactor Facilities

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I. Objective

The objective of this Regulatory Guide is to establish relative importance as to various functions to ensure safety (hereinafter referred to as "safety function") of light water nuclear power reactor (hereinafter referred to as "LWR") facilities from the safety standpoint and, thereby, provide basis for imposing suitable requirements on the design of structures, systems and components (hereinafter referred to as "SSCs") required to perform their safety functions.

II. Position and scope of application

This Regulatory Guide provides fundamental criteria for determining importance of safety functions in applying various requirements set forth in "Regulatory Guide for Reviewing Safety Design of Light Water Nuclear Power Reactor Facilities"(hereinafter referred to as "Safety Design Guide") in practice in the license review of applications for Establishment Permit (including Modification Permit) of LWRs.

III. Classification of the importance of safety functions

1. Categorization of safety functions

SSCs bearing safety functions are classified into two categories according to the nature of their safety functions as outlined below:

(1) SSCs whose failure could cause abnormal conditions at nuclear reactor facilities, thereby lead to undue radiation exposure to the public or site personnel: abnormality prevention systems (hereinafter referred to as "PS").
(2) SSCs whose function is to prevent, in case of abnormal conditions at nuclear reactor facilities, an escalation of such conditions or put such conditions under control immediately, thereby prevent or mitigate possible undue radiation exposure to the public or site personnel: abnormality mitigation systems (hereinafter referred to as "MS").

2. Classification of safety importance

SSCs falling into PS and MS categories are further classified into Class 1, Class 2 and Class 3 according to the importance of their safety functions and designated as shown in Table 1. Definitions and safety functions of the SSCs belonging to the respective classes are shown in Table 2.

Table 1 Classification of the importance of safety functions

Classification by importance \ Categorization by function		SSCs with safety functions		SSCs without safety functions
		PS (with abnormality prevention functions)	MS (with abnormality mitigation functions)	
Safety-related SSCs	**Class 1** **Class 2** **Class 3**	**PS-1** **PS-2** **PS-3**	**MS-1** **MS-2** **MS-3**	-
Non-safety-related SSCs		-	-	SSCs with non-safety functions alone

Table 2 Definitions and functions for classification of the importance of safety functions (1/3)

Classification		Definition	Function
Class 1	**PS-1**	SSCs whose damage or failure could cause events leading to: (a) considerable core damage or (b) significant fuel failures.	1) Functions to form reactor coolant pressure boundary
			2) Functions to prevent excessive reactivity insertion
			3) Functions to maintain core geometry
	MS-1	1) SSCs capable of urgently shutting down the reactor, removing residual heat and preventing overpressure within the reactor coolant pressure boundary in the event of abnormal conditions, thereby preventing undue radiological influence on the off-site public.	1) Emergency shutdown of the reactor
			2) Functions to maintain sub-criticality
			3) Functions to prevent overpressure within the reactor coolant pressure boundary
			4) Functions to remove residual heat after reactor shutdown
			5) Functions to cool reactor core
			6) Functions to confine radioactive materials, shield radiation and reduce radioactive release
		2) Other SSCs essential to safety	1) Functions to generate actuation signals for the engineered safety features and reactor shutdown system
			2) Supporting functions especially important to safety

Class 2	**PS-2**	1) SSCs whose damage or failure could cause events, without considerable core damage or significant fuel failures, leading to excessive release of radioactive materials to the off-site areas.	(1) Functions to contain reactor coolant (Except for: small-diameter pipes excluded from the reactor coolant pressure boundary such as instrumentation pipes; other pipes and equipment which are not directly connected to the boundary.)
			2) Functions to store radioactive materials, without direct connections to the reactor coolant pressure boundary
			3) Functions to handle fuels safely

Table 2 Definitions and functions for classification of the importance of safety functions (2/3)

Classification		Definition	Function
Class 2	PS-2	2) SSCs which are required to function during normal operation and anticipated operational occurrences and whose failure could lead to degraded core cooling.	1) Functions to reseat safety valves and relief valves
	MS-2	1) SSCs capable of sufficiently reducing radiological influence on the off-site public in case of damages or failures of PS-2 SSCs	1) Functions to make up water for fuel storage pool
			2) Functions to prevent radioactive materials release
		2) SSCs especially important to cope with abnormal conditions	1) Functions to monitor plant conditions in case of an accident
			2) Functions to mitigate abnormal conditions
			3) Functions to shutdown reactor safely from outside the control room
Class 3	PS-3	1) SSCs which are not part of PS-1 and PS-2 SSCs and whose failure could become initiating events of abnormal conditions.	1) Functions to retain reactor coolant (other than PS-1 and PS-2)
			2) Functions to circulate reactor coolant
			3) Functions to store radioactive materials
			4) Functions to supply electric power (except for emergency power supply)
			5) Functions for plant instrumentation and control (except for safety protection function)
			6) Auxiliary functions for plant operation
		2) SSCs capable of controlling the concentration of radioactive materials in reactor coolant as low as acceptable for normal operation.	1) Functions to prevent the dispersion of fission products into reactor coolant
			2) Functions to clean up reactor coolant

Table 2 Definitions and functions for classification of the importance of safety functions (3/3)

Classification		Definition	Function
Class 3	MS-3	1) SSCs capable of mitigating anticipated operational occurrences in conjunction with MS-1 and MS-2.	1) Functions to mitigate reactor pressure increase
			2) Functions to suppress reactor power increase
			3) Functions to make up reactor coolant

		2) SSCs required to cope with abnormal conditions	Functions important to emergency measures and monitoring of abnormal conditions

IV. Principles for the Application of Classification

To put the classification shown in Table 2 into practice, the following requirements shall be met in principle:

1. Scope and classification of supporting systems

The SSCs designed to directly fulfill the safety functions in Table 2 will be hereinafter referred to as 'competent systems'. The SSCs necessary, directly or indirectly, for a competent system to fulfill its safety functions will be hereinafter referred to as 'supporting systems'.

The scope and classification of supporting systems are specified as follows:

(1) Supporting systems directly needed for a competent system to fulfill its safety functions are considered to have the importance equivalent to that of competent systems.

(2) Supporting systems needed for a competent system to maintain or assure its reliability but not directly needed to fulfill its safety functions are considered to have the importance lower than that of competent systems. However, supporting systems for a competent system of class 3 is considered to be class 3.

2. SSCs with two or more safety functions

SSCs with two or more safety functions shall meet every design requirement for the safety functions to be fulfilled.

3. Requirement of separation and isolation

Adequate consideration shall be given to functional isolation and physical separation between two or more SSCs with safety functions as well as between those with and without safety functions so that the expected safety functions of any SSCs of equivalent or higher importance are not impaired by the operation or failure of the others, thereby not threatening the safety of nuclear reactor facilities.

4. Connection between different classes

When SSCs of different classes are connected, design requirements equivalent to those for higher class shall be applied to lower class. Alternatively, adequate functional isolation by means of, for example, isolation devices equivalent to higher class shall be considered so that the safety functions of SSCs of higher class are not impaired by the failure of lower class SSCs.

V. Design considerations for SSCs with safety functions

1. Fundamental objectives

Basic design or design principles for the SSCs in each class shall be such that the following fundamental objectives shall be achieved in the light of ensuring safety functions through established design, construction and testing techniques and operational management.

(1) Class 1: Ensure and maintain reliability as high as reasonably achievable
(2) Class 2: Ensure and maintain high reliability.
(3) Class 3: Ensure and maintain reliability equivalent to or higher than that of ordinary industrial facilities.

2. Application of Classification to Safety Design Guide

SSCs with safety functions shall reflect necessary design considerations to achieve the fundamental objectives described in section 1 above. Hence, the classification in this guide is applied to Safety Design Guide as specified below:

(1) Design considerations for reliability

The systems indicated below are considered to be 'systems with safety functions of especially high importance' that are referred to in item (2) of Guideline 9 of Safety Design Guide.

(a) Among PS-1 SSCs, the valves that are open during normal operation and closed in case of an accident to perform the function as a part of the reactor coolant pressure boundary.
(b) MS-1
(c) Among MS-2 SSCs, the systems that perform the function to monitor plant conditions in case of an accident

(2) Design considerations against natural phenomena

The SSCs indicated below are considered to be 'SSCs with safety functions of especially high importance' that are referred to in item (2) of Guideline 2 of Safety Design Guide.

(a) Class1
(b) Among class 2 SSCs, SSCs that are susceptible to natural phenomena in particular and whose functions are difficult to maintain by alternative measures or extremely difficult to restore

(3) Design considerations for electrical systems

'Safety functions of especially high importance' and 'safety functions of high importance', which are referred to in item (1) and item (4) respectively of Guideline 48 of Safety Design Guide, are as indicated below.

Commentary

I. Objective

In license review of the applications for Establishment Permit of LWRs, Safety Design Guide is applied to examine the adequacy of the proposed safety design provisions for the nuclear reactor facilities involved. The requirements specified in Safety Design Guide should be applied properly according to the relative importance of SSCs to safety. It is therefore necessary to properly classify the safety functions to be performed by SSCs according to their importance to safety.

It is the objective of this "Regulatory Guide for Reviewing Classification of Importance of Safety Function for Light Water Nuclear Power Reactor Facilities" (which will be referred to as 'Importance Classification Guide') to provide the fundamental criteria as to the importance of safety functions in applying Safety Design Guide and establish the bases for adequate requirements to be met in the design of SSCs with safety functions.

II. Position and scope of application of this Guide

As mentioned above, this guide should be applied in the license review of the applications for Establishment Permit of LWRs in conjunction with Safety Design Guide. Needless to say, there are various safety requirements to be met in the stages not only for design but also for construction and operation. These requirements must be appropriate and consistent according to the importance of safety functions to be fulfilled by the SSCs involved. This guide, which is primarily applied in the license review for Establishment Permit of LWR as mentioned above, is also considered to serve as a reference when specific safety requirements are set in the detailed design and subsequent stages.

Outlined below are some points that require particular attention when this guide is practically applied:

Firstly, it should be noted that the classification of safety function importance shown in Table 2 of this guide and the examples of SSCs shown in the attached table are based on the concept of LWRs that are considered to be standard in design when this guide was established. Therefore, in order to establish proper classification for nuclear reactor facilities with different designs, correct and thorough understanding of the purport of this guide is indispensable.

Secondly, the classification specified in this guide reflects a comprehensive review of expert judgment as to how individual safety functions play their roles for the overall safety of the nuclear reactor facility. There may appear to be disagreement between the classification in this guide and some other classifications with respect to specific aspects of SSCs. Such examples may be found in the importance classification for seismic design specified in "Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities" (hereinafter referred to as 'Seismic Design Guide') and the classification for structural design of nuclear components specified in Ministry of Economy, Trade and Industry departmental order 62. It is necessary to fully

(a) Safety functions of especially high importance

i) PS-1

ii) MS-1

iii) Among MS-2 functions,

a) Functions to make up water for the fuel storage pool

b) Functions to monitor plant conditions in case of an accident

c) Functions to check reactor coolant release from relief valves among functions to mitigate abnormal conditions

d) Functions for safe reactor shutdown from outside of the control room

(b)Safety functions of high importance

i) Class 1

ii) Class 2

understand the differences between them in terms of purpose, purport, characteristics focused, etc. Mechanical application or diversion of one to another should be avoided.

III. Classification of safety function importance

This guide covers all the SSCs related to the safety of nuclear reactor facilities in any way. Considering that the requirements for them depend on the nature of functions to be performed, the basis of the classification is focused on the functions necessary to ensure safety (safety functions).

SSCs with safety functions are broadly classified into two categories; prevention systems (PS) with the functions to prevent abnormal conditions from taking place and mitigation systems (MS) with the functions to cope with abnormal conditions upon their occurrence. This classification reflects a consideration that the requirements for the functions of these two categories are not the same. Furthermore, safety importance is classified into three classes for each of the two categories. There are no safety requirements for SSCs which are outside of these categories. Examples of typical SSCs with the functions shown in Table 2 are listed for reference in the attached table.

IV. Principles for application of classification

Although the basic points to be noticed in applying the classification in this guide are as outlined in II above, more detailed principles to be observed in its practical application are summarized below:

1. Scope and classification of supporting systems

In this guide, the SSCs designed to directly fulfill required safety functions are referred to as 'competent systems'. In case of loss of coolant accident (LOCA), for example, the function to inject cooling water and cool the core is performed by the emergency core cooling system (ECCS). Therefore, the ECCS is the competent system with respect to the core cooling function during a LOCA.

However, required safety functions may not always be fulfilled by competent systems alone. For the ECCS to fulfill its safety functions, other provisions are, more or less, necessary such as: the safety protection system for generating actuation signals; electric systems (including emergency on-site power system) for supplying power; auxiliary cooling systems for cooling components; instrumentation for monitoring and assuring the reliability of the systems; testing equipment; foundations and supports for fixing components; building for containing the system and associated ventilation systems. As shown in this example, those SSCs needed, directly or indirectly, for a competent system to fulfill its safety functions are referred to as 'supporting systems' in this guide.

However, it should be noted that even if SSCs are regarded as supporting systems by the above definition, they should be categorized as competent systems provided that they have a wide

range of SSCs relying on their supporting functions. One of the examples is 'other SSCs essential to safety' as part of MS-1 in Table 2 of this guide.

All supporting systems other than those mentioned above are divided into two groups: (a) supporting systems which are directly needed by a competent system for fulfilling its safety functions and (b) the others. The importance of the former group shall be considered to be equivalent to that of the competent systems, whereas the importance of the latter group can be considered to be lower. However, among the supporting systems in the latter group, those of which competent systems are class 3 shall be considered as class 3 because they have safety-related functions.

'Supporting systems directly needed for a competent system to fulfill its safety functions', as mentioned above, imply indispensable SSCs without which the competent system would not be able to perform or maintain its functions, such as instrumentation for startup and operational control, driving systems, component cooling systems and equipment fuel systems. 'The importance of the supporting systems directly needed for a competent system to fulfill its safety functions shall be considered to be equivalent to that of the competent systems', as mentioned above, implies that the competent system together with their supporting systems as a whole shall ensure and maintain the required reliability and that equivalent design considerations shall be given to both the competent system and their supporting systems in order to satisfy, as a whole, the requirements for the competent system.

For instance, provided that a competent system shall be designed not to lose its safety functions with the assumption of a single failure in the system, it is necessary that an assumption of a single failure in the supporting systems directly needed for the competent system to fulfill its safety functions would not lead to a loss of safety functions of the competent system. However, this is not to require an assumption of independent failures in both a competent system and its supporting systems.

2. SSCs with two or more safety functions

Many of SSCs with safety functions may have multiple different safety functions. For instance, take safety valves and relief valves connected to the reactor coolant pressure boundary. They serve as PS as part of the pressure boundary under normal conditions and serve as MS to mitigate overpressure under abnormal conditions. Some system design may also include a pump as part of ECCS as well as part of residual heat removal system. That is to say, SSCs with multiple different safety functions shall meet the respective design requirements imposed on all safety functions that they are expected to fulfill.

3. Requirement of separation and isolation

If it appears that there could be interaction between one of SSCs with safety functions and the others, the influence from any of them shall not impair the safety functions expected for other SSCs of equivalent or higher importance. Hence, it is required that SSCs with safety functions should be designed giving adequate considerations to functional isolation, physical separation or their combination so that their safety functions are not affected by other SSCs of equivalent or

lower importance (including those having no safety functions) .

Examples of aforementioned 'functional isolation' are: systems connected by tie line are isolated from each other by appropriate arrangement of valves; instrumentation systems are divided by insulation amplifier or the like; relays/breakers are used to provide electric isolation between two electric circuits. 'Physical separation' refers to providing an appropriate geometrical layout or physical barriers such as walls and weirs.

The requirements in this section do not necessarily mean that SSCs with safety functions must have independence in the strict sense of the word. The requirements can be considered to be met if it is evident that expected safety functions in design are not impaired by any possible mutual effects.

4. Connection between different classes

Practical methods to be followed for functional isolation in connecting SSCs of different classes are as specified in IV-3 in this guide. The reliability of isolation portions shall be equivalent to that of higher class.

V. Design Considerations for SSCs with safety functions

1. Fundamental objectives

Once safety functions necessary to ensure the safety of nuclear reactor facilities and their relative importance have been determined, various requirements are imposed upon the SSCs that have such safety functions. The ultimate objective of these requirements is to ensure sufficiently high reliability according to the importance of respective safety functions.

This guide, which provides guidance on the practical application of Safety Design Guide pertaining to the importance of safety functions, aims at the" basic design or basic design principles for nuclear reactor facilities. Needless to say, high reliability cannot be achieved only with design considerations but requires consistent efforts through the respective stages of construction and operational management, where such efforts may be mutually complementary. The fundamental objectives specified in this section should be attained not only by design but also by quality assurance activities in the subsequent stages eventually. The basic design or design principles should be such that consideration is given to adequate implementation of necessary activities in the subsequent stages and that the feasibility of achieving the fundamental objectives specified in this guide by these integral efforts can be confirmed.

In general, SSCs, including not only nuclear reactor facilities but also other industrial facilities, are subject to certain codes and standards, which are based on domestic laws and regulations, and/or private and foreign codes and standards considered to be appropriate so that adequate reliability can be ensured. SSCs of class 3 specified in this guide are those for which at least the ordinary industrial level of reliability is considered to be necessary and which thus come under the application of the Building Standards Act, Japanese Industrial Standards, ordinary electric works regulations, etc. As far as nuclear

reactor facilities are concerned, however, it is a general practice to impose reliability requirements higher than the ordinary industrial level on SSCs important to safety in view of the significance of safety. In Seismic Design Guide, for example, it is required that SSCs of classes S and B withstand design seismic forces severer than specified in the Building Standards Act. The Ministry of Economy, Trade and Industry departmental order 62 also imposes severe requirements for mechanical design on components of high importance. This guide, basically similar in concept to those legal requirements, also demands that SSCs of classes 1 and 2 be more reliable than those of ordinary industrial facilities. Specific measures to be taken to ensure the required level of reliability in respective stages of design, construction and operational management depend on the structure, working principles, service conditions, characteristics, etc. of individual SSCs. Therefore, specific measures to meet the individual reliability requirements shall be adequately determined in the light of the fundamental objectives of this guide. For example, when the concrete measures or requirements for maintenance of SSCs are determined for operation management phase, it is adequate to refer to risks such as operational experience and/or PSA results maintaining the safety function specified in this guide. This reflects recent progress in PSA technology as well as the viewpoint of enhancement of scientific rationality, consistency and transparency in nuclear safety and appropriate allocation of limited resources.

2. Application of classification to Safety Design Guide

Adequate design considerations should be given to SSCs with safety functions reflecting their features in order to attain the fundamental objectives specified in V-1 of this guide. Although basic requirements for design considerations are indicated in Safety Design Guide, practical applications are indicated in this guide as referred to in Safety Design Guide.

(1) Design considerations for reliability

Guideline 9 of Safety Design Guide requires in items (2) that the 'systems with safety functions of especially high importance' be designed with redundancy or diversity and with independence, and in item (3) that they be designed to be capable of fulfilling their safety functions even in case of unavailability of off-site power, in addition to an assumption of a single failure of any of the components that comprise the systems. These requirements are in general applied to the systems of MS-1 and part of the systems of PS-1 and MS-2.

Parts of the PS-1 SSCs to which the above requirements are applied are the valves that are normally open and those closed, in case of an accident, thereby forming a part of the reactor coolant pressure boundary. In the systems equipped with such valves, the reactor coolant pressure boundary is defined as the range up to and including the second isolation valves as viewed from the reactor side. This means that redundancy is required for the valves of this kind.

Parts of the MS-2 SSCs to which the above requirements are applied are the systems that have the function of monitoring the plant conditions in case of an accident. They are the systems required for monitoring the condition of the three most important functions for ensuring safety: reactor shutdown, core cooling and radioactivity confinement. With regard to the reliability of

instrumentation and control systems, Safety Design Guide requires that monitoring or estimation of reactor shutdown and core cooling conditions in particular shall be ensured by use of two or more kinds of parameters. This is a requirement for diversity in monitoring the reactor shutdown and core cooling conditions. In addition, "Regulatory Guide for Reviewing Radiation Monitoring in Accidents of Light Water Nuclear Power Reactor Facilities" requires redundancy of the principal radiation monitoring systems which provide the information to confirm the integrity of radioactivity barriers.

(2) Design considerations against natural phenomena

Guideline 2 of Safety Design Guide requires in item (2) the design considerations against postulated natural phenomena other than earthquake and specifies the design consideration for 'SSCs with safety functions of especially high importance'. SSCs of class 1, in general, come under the application of these requirements, so do those of class 2 which are susceptible to natural phenomena as well. Generally speaking, buildings and outdoor structures are considered to be susceptible to natural phenomena. Among class 2 structures and buildings, both the exhaust stack of the auxiliary building of PWR and the exhaust stack of BWR excluding the support function for the exhaust pipe of the standby gas treatment system correspond to above-mentioned SSCs as competent systems. Moreover, buildings belonging to class 2 correspond to this kind of SSCs as supporting systems.

(3) Design considerations for electrical systems

Guideline 48 of Safety Design Guide requires in item (1) that SSCs with 'safety functions of especially high importance' shall be capable of receiving electric power supplies from emergency on-site power systems. The safety functions to which this requirement is applied are in general the functions of class 1 and part of the functions of class 2. The functions of class 2 to which the requirement for emergency on-site power supply is applied are: the function for water makeup for the spent fuel pool and the functions especially important to cope with abnormal conditions. The systems and components with the latter functions are: a part of the instruments for monitoring the plant conditions in case of an accident mentioned in (1) above; a system for shutting down the reactor from outside the control room; PWR pressurizer relief valves (manual operation function) and their block valves.

Attached Table: Examples of classification of safety function importance in PWRs and BWRs (1/14)

Classification	Prevention system						
	Definition	**Function**	**SSC (PWR)**	**Significant supporting system (PWR)**	**SSC (BWR)**	**Significant supporting system (BWR)**	**Remarks**
PS-1	SSCs whose damage or failure may cause events potentially leading to: (a) considerable core damage or (b) significant fuel failures	1) Functions for reactor coolant pressure boundary	Components and pipelines forming the reactor coolant pressure boundary (except for small-diameter pipes and equipment for instrumentation and control)		Components and pipelines forming the reactor coolant pressure boundary (except for small- diameter pipes and equipment for instrumentation and control)		
		2) Functions to prevent excessive reactivity insertion	Control rod drive mechanism pressure housing		Control rod coupling		
		3)Functions to maintain core geometry	Core support structures (core barrel, upper core support plate, upper core support column, upper core plate, lower core plate, lower core support column, lower core support plate), fuel assembly (except for fuel)		Core support structures (core shroud, shroud support, upper grid plate, core support plate, control rod drive guide tube), fuel assembly (except for fuel)		

Attached Table: Examples of classification of safety function importance in PWRs and BWRs (2/14)

Classification	Mitigation system						
	Definition	**Function**	**SSC (PWR)**	**Significant supporting system (PWR)**	**SSC (BWR)**	**Significant supporting system (BWR)**	**Remarks**
MS-1	1) Structures, systems and components capable of urgently shutting down the reactor, removing residual heat and preventing overpressure in the reactor coolant pressure boundary in the event of abnormal conditions, thereby preventing undue radiological influence to the off-site public	1) Functions to shut down the reactor urgently	Reactor shutdown system by control rods (control rod cluster and control rod drive system (scram function)		Reactor shutdown system by control rod (control rod and control rod drive system (scram function)		
		2) Functions to maintain sub-criticality	Reactor shutdown system (control rod system, boron injection function of the chemical and volume control system and the emergency core cooling system)		Reactor shutdown system (control rod system, standby liquid control system)		
		3) Functions to prevent overpressure within the reactor coolant pressure boundary	Pressurizer safety valve (opening function)		Safety relief valve (opening function as safety valve)		

Attached Table: Examples of classification of safety function importance in PWRs and BWRs (3/14)

Classification	Mitigation system						
	Definition	**Function**	**SSC (PWR)**	**Significant supporting system (PWR)**	**SSC (BWR)**	**Significant supporting system (BWR)**	**Remarks**
MS-1		4)Functions to remove residual heat after reactor shutdown	Systems for removing residual heat (residual heat removal system, auxiliary feed-water system, main steam system and feed-water system up to the isolation valve in the secondary system of the steam generator, main steam safety valve, main steam relief valve (manual relief function))		Systems for removing residual heat (residual heat removal system (cooling mode at reactor shutdown), reactor core isolation cooling system, high pressure core spray system, safety relief valve (manual relief function), automatic depressurization system (manual relief function))		
		5) Functions to cool reactor core	Emergency core cooling system (low pressure coolant injection system, high pressure coolant injection system, accumulator injection system)		Emergency core cooling system (low pressure core spray system, low pressure coolant injection system, high pressure core spray system, automatic depressurization system)		

Attached Table: Examples of classification of safety function importance in PWRs and BWRs (4/14)

Classification	Mitigation System						
	Definition	**Function**	**SSC (PWR)**	**Significant supporting system (PWR)**	**SSC (BWR)**	**Significant supporting system (BWR)**	**Remarks**
MS-1		6) Functions to confine radioactive materials, shield radiation and reduce radioactivity release	Reactor containment, annulus , reactor containment isolation valves, reactor containment spray system , annulus recirculation system, safety-related auxiliary equipment room cleanup system, flammable gas concentration control system	Reactor containment exhaust stack	Reactor containment, reactor containment isolation valves, reactor containment spray cooling system , reactor building, standby gas treatment system , standby recirculation gas treatment system, flammable gas concentration control system	Exhaust stack (support function for the exhaust pipe of the standby gas treatment system)	
	2) Other structures , systems and components essential to safety	1) Functions to generate actuation signals for the engineered safety features and reactor shutdown system	Reactor protection system		Reactor protection system		

Attached Table: Examples of classification of safety function importance in PWRs and BWRs (5/14)

Classification	Mitigation System						
	Definition	**Function**	**SSC (PWR)**	**Significant, supporting system (PWR)**	**SSC (BWR)**	**Significant supporting system (BWR)**	**Remarks**
MS-1		2) Supporting functions especially important to safety	Emergency on-site power system, control room and its shielding and ventilating system, component cooling water system, sea water system, direct current power supply system, instrument air system (each related to MS- 1)	Diesel generator fuel transport system, diesel cooling system, water intake system (including outdoor trench)	Emergency on-site power system, control room and its shielding and emergency ventilating system, emergency component cooling water system, direct current power supply system (each related to MS-1)	Diesel generator fuel transport system, diesel cooling system, water intake system (including outdoor trench)	

Attached Table: Examples of classification of safety function importance in PWRs and BWRs (6/14)

Classification	Prevention System						
	Definition	Function	SSC (PWR)	Significant supporting system (PWR)	SSC (BWR)	Significant supporting system (BWR)	Remarks
PS -2	1) Structures, systems and components whose damage or failure could cause events leading to excessive release of radioactive materials to off-site areas, but hardly leading to considerable core damage or significant fuel failure.	1) Functions to containment reactor coolant (except for small- diameter pipes that are excluded from the reactor coolant pressure boundary, such as those for instrumentation, and other pipes and equipment not directly connected to the boundary)	Extraction and purification systems of the chemical and volume control System		Main steam system, reactor coolant cleanup system (each outside containment isolation valve only)		

Attached Table: Examples of classification of safety function importance in PWRs and BWRs (7/14)

Classification	Prevention System						
	Definition	**Function**	**SSC (PWR)**	**Significant supporting system (PWR)**	**SSC (BWR)**	**Significant supporting system (BWR)**	**Remarks**
PS-2		2) Functions to storage radioactive materials, without direct connection to the reactor coolant pressure boundary	Radioactive waste treatment system (with large radioactivity inventory)*1, spent fuel pit (including spent fuel rack)	Spent fuel pit cooling System	Radioactive waste treatment system (with large radioactivity inventory)*1, spent fuel pool (including spent fuel storage rack)	Spent fuel pool cooling system	Radioactive gaseous waste treatment systems come under this category at present.
		3) Functions to handling fuel safely	Fuel handling system		Fuel handling system		
	2) Structures, systems and components whose functioning is required during normal operations and anticipated operational occurrences and whose failure may lead to degraded core cooling.	1) Functions to reseat safety valves and relief valves	Pressurizer safety valve, pressurizer relief valve (each related to reseating function)		Safety relief valve (related with reseating function)		

Attached Table: Examples of classification of safety function importance in PWRs and BWRs (8/14)

Classification	Mitigation System						
	Definition	**Function**	**SSC (PWR)**	**Significant, supporting system (PWR)**	**SSC (BWR)**	**Significant supporting system (BWR)**	**Remarks**
MS -2	1) SSCs capable of sufficiently reducing radiological exposure to the off-site public in case of damage or failure of structures, systems and components belonging to PS-2	1) Functions to make up water for the fuel storage pool	Spent fuel pit makeup water system		Emergency makeup water system		*2. PWR containment area monitor and BWR containment atmosphere radioactivity monitor come under this category at present.
		2) Functions to prevent radioactive materials release	Systems for reducing radioactivity release in case of a fuel assembly drop accident, exhaust stack (auxiliary building)		Radioactive gaseous waste treatment system isolation valve, exhaust stack (except for support function for the exhaust pipe of the standby gas treatment system)		
	2) Structures, systems and components especially important to cope with abnormal conditions	1) Functions to monitor plant status in case of an accident	Part of the monitoring instruments for use during accident *2		Part of the monitoring instruments for use during accident *2		

Attached Table: Examples of classification of safety function importance in PWRs and BWRs (9/14)

Classification	Mitigation System						
	Definition	**Function**	**SSC (PWR)**	**Significant supporting system (PWR)**	**SSC (BWR)**	**Significant supporting system (BWR)**	**Remarks**
MS-2		3) Functions to shutdown reactor safely from outside the control room	Remote shutdown system (related to safe shutdown function)		Remote shutdown system (related to safe shutdown function)		

Attached Table: Examples of classification of safety function importance in PWRs and BWRs (10/14)

Classification	Prevention System						
	Definition	**Function**	**SSC (PWR)**	**Significant supporting system (PWR)**	**SSC (BWR)**	**Significant supporting system (BWR)**	**Remarks**
PS-3	1) Structures, systems and components not belonging to PS-1 and PS-2 whose failure could become initiating events of abnormal conditions	1) Functions to Retain reactor coolant (other than PS-1 and PS -2)	Instrumentation piping, sampling line		Instrumentation piping, sampling line		*3. Radio- active liquid and solid waste treatment systems come under this category at present
		2) Functions to circulate reactor coolant	Primary coolant pump and its supporting systems		Reactor coolant recirculation system		
		3) Functions to store radioactive materials	Radioactive waste treatment system (with small radioactivity inventory) *3		Suppression pool water drain system, condensate water storage tank, radioactive waste treatment system (with small radioactivity inventory) *3		

Attached Table: Examples of classification of safety function importance in PWRs and BWRs (11/14)

Classification	Prevention System						
	Definition	**Function**	**SSC (PWR)**	**Significant supporting system (PWR)**	**SSC (BWR)**	**Significant supporting system (BWR)**	**Remarks**
PS-3		4) Functions to supply electric power (except for emergency power supply)	Main steam system (downstream of isolation valve), feed-water system (up to isolation valve), power transmission line, transformer, switch yard		Turbine, power generator and its exciter, condensate system (including condenser), feed-water system, circulating water system, power transmission line, transformer, switch yard		
		5) Functions for plant instrumentation and control (except for safety protection function)	Reactor control system, reactor instrumentation, process instrumentation		Reactor control system (including rod worth minimizer), reactor neutron monitoring system, reactor plant process instrumentation		

Attached Table: Examples of classification of safety function importance in PWRs and BWRs (12/14)

Classification	Prevention System						
	Definition	**Function**	**SSC (PWR)**	**Significant supporting system (PWR)**	**SSC (BWR)**	**Significant supporting system (BWR)**	**Remarks**
PS-3		6) Auxiliary functions for plant operation	Auxiliary steam system, instrument air system (other than MS-1)		Station boiler, instrument air system		
	2) Structures, systems and components capable of control the concentration of radioactive materials in reactor coolant as low as acceptable for normal operation	1) Functions to prevent the dispersion of fission products into reactor coolant	Fuel cladding		Fuel cladding		
		2) Functions to clean up reactor coolant	Purification system of the chemical and volume control system (purification function)		Reactor water cleanup system, condensate demineralizer system		

Attached Table: Examples of classification of safety function importance in PWRs and BWRs (13/14)

Classification	Mitigation System						
	Definition	**Function**	**SSC (PWR)**	**Significant supporting system (PWR)**	**SSC (BWR)**	**Significant supporting system (BWR)**	**Remarks**
MS-3	1) Structures, systems and components capable of mitigating anticipated operational occurrences in conjunction with MS-1 and MS-2	1) Mitigation of reactor pressure increase	Pressurizer relief valve (automatically operated)		Safety relief valve (relief valve function), turbine bypass valve		
		2) Suppression of reactor power increase	Turbine run-back system, control rod withdrawal inter-locks		Reactor coolant recirculation system (recirculation pump trip function), rod block monitor		
		3) Reactor coolant makeup	Feed system of the chemical and volume control system, primary coolant feed system		Control rod drive hydraulic control system		

Attached Table: Examples of classification of safety function importance in PWRs and BWRs (14/14)

Classification	Mitigation System						
	Definition	**Function**	**SSC (PWR)**	**Significant supporting system (PWR)**	**SSC (BWR)**	**Significant supporting system (BWR)**	**Remarks**
MS-3	2) SSCs necessary for coping with abnormal conditions	1) Functions important to emergency in arrangement and monitoring of abnormal conditions	Nuclear power plant emergency station, sampling system, communication system, radiation monitoring system, part of the monitoring instruments for use during accident, fire extinguishing system, safe escape route, emergency lighting		Nuclear power plant emergency station, sampling system, communication system , radiation monitoring system, part of the monitoring instruments for use during accident, fire extinguishing system, safe escape route, emergency lighting		

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Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities

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1. Introduction

This Guide provides the basis for judging the adequacy of the seismic design policy of the application for the establishment license (including the application of its alteration) of light water power reactors in the safety review process.

The former version 'Regulatory Guide for Reviewing Seismic Design of Nuclear Power Rector Facilities (decided by the Nuclear Safety Commission (NSC) on 20 July 1981 and partially revised on 29 March 2001, hereinafter referred to as the "Former Guide")' was effectuated after revision in July 1981, based on the state-of-the-art evaluating methods of static seismic forces etc., of the original version, which had been formulated in September 1978 by the then Atomic Energy Commission (AEC).

This new version comprehensively reflects latest seismological and earthquake engineering knowledge accumulated as well as remarkable improvement and development of seismic design technologies of nuclear power reactor facilities.

The New Guide shall be subject to further revision, as appropriate, reflecting the new knowledge and experiences in accordance with new findings.

2. Scope of Application

This Guide shall be applied to the light water nuclear reactor facilities for power production ("Facilities").

The basic concept of this Guide could be also referred to for nuclear reactor facilities other than light water reactors as well as other nuclear related facilities.

Even if the license application does not fully comply with this guide, it could be acceptable if it ensures equivalent or higher seismic safety than the requirements of this guide by reflecting technological improvements or development.

3. Basic Policy

Those Facilities designated as important from the seismic design standpoints shall be designed to bear the seismic forces exerted from the earthquake ground motion and to maintain their safety functions, which could be postulated appropriately to occur with a very low possibility in the service period of the Facilities from the seismological and earthquake engineering

standpoints, considering such as geological features, geological structures, seismicity, etc. in the vicinity of the proposed site.

Any Facilities shall be designed to bear the design base seismic forces with sufficient margin, which are assumed appropriately for each seismic classification from the standpoint of radiological impacts to the environment due to earthquakes.

Buildings and structures shall be founded on the grounds which have sufficient supporting capacities.

(Commentary)

I. Basic Policy

(1) Formulation of earthquake ground motions for seismic design

The seismic design shall be based on the principle to avoid any risks of serious radiological exposure to the public in the vicinity of the Facilities due to the external disturbance initiated by an earthquake, by appropriately formulating 'the ground motion' for the seismic design, which could be postulated appropriately to occur with a very low probability in the service period of the Facilities and could have serious affects to the Facilities.

This policy is equivalent to the 'basic policy' in the Former Guide which required the seismic design in its provision that 'nuclear power reactor facilities shall maintain sufficient seismic integrities against any postulated seismic forces so that no serious accidents would be induced'.

(2) Existence of "Residual Risks"

From a seismological standpoint, the possibility of stronger earthquake ground motions which may exceed the one formulated as above (1) exists. That is, in formulating the seismic design earthquake ground motions, the "Residual Risks" exist, which may cause serious damages to the Facilities by the ground motion exceeding the formulated design basis ground motions, or massive radioactive release from the Facilities, or cause as a consequence radiological exposure hazards to the public in the vicinity of the Facilities.

Therefore, every effort should be made, at the design of the Facilities (in the basic design stage and subsequent stages), to minimize the "residual risks" to the extent "as low as practically possible" by appropriate attention to the possibility of ground motions exceeding the formulated design basis. .

4. Classification of Importance in Seismic Design

Importance in seismic design of the Facilities shall be classified as in the following, considering the possible impacts of radiation to the environment caused by an earthquake.

(1) Classification of Functions

Class S: The Facilities containing radioactive materials or their relevant Facilities, loss of functions of which might lead to the release of the radioactive materials to the environment; the Facilities necessary to prevent such events; and the Facilities with significant roles to mitigate the consequences of radioactive release in case such accidents occur,

Class B: The Facilities of the same functional categories as above Class S, with lower roles,

Class C: The Facilities other than Class S or B, necessary to ensure equivalent safety as conventional industrial facilities.

(2) Facilities of Classes

Following are the specific Facilities in the above-defined classification of importance in the seismic design,

(a) Class S Facilities:

i) Equipment/piping systems composing the 'reactor coolant pressure boundaries' (as defined in the Regulatory Guide for Reviewing Safety Design of Light Water Nuclear Power Reactor Facilities),
ii) the Facilities to store spent fuels,
iii) the Facilities to insert negative reactivity to quickly shut down the reactor and the Facilities to maintain the reactor in the shutdown mode,
iv) the Facilities to remove the decay heat from the reactor core after reactor is shut down,
v) the Facilities to remove the decay heat from the reactor core after the accident of the loss of reactor coolant pressure boundaries,
vi) the Facilities to function as the pressure barrier for preventing the immediate release of radioactive materials when the reactor coolant pressure boundaries are broken, and
vii) the Facilities, other than those in the above category vi), to mitigate the radioactive release to the environment at an accident which may cause radioactive release.

(b) Class B Facilities:
i) The Facilities directly connected to the reactor coolant pressure boundaries, which contain or may contain radioactive materials therein,
ii) The Facilities containing radioactive wastes, but not those facilities which have sufficiently low risks of radiological exposure to the public due to their break as compared with the annual exposure dose limit outside the peripheral observation area, because of their limited inventory of radioactive waste or their storage capabilities,
iii) The Facilities relevant to radioactive material other than radioactive waste and their break may cause excessive radiological exposure to the public and the operational personnel,
iv) The Facilities to cool the spent fuels, and
v) The Facilities other than Class S, to mitigate external release of radioactive materials to the environment at an accident.

(c) Class C Facilities:
Those Facilities other than Class S or B

5. Formulation of Design Basis Earthquake Ground Motion (DBEGM)

The ground motion to be established as the seismic design basis of the Facilities shall be formulated appropriately as the one, postulating to occur in a very low probability over the service period of the Facilities from the seismological and earthquake engineering point of view on geology, geological structures, seismicity, etc. in the vicinity of the proposed site, and having risks to give serious damages to the Facilities (the "Design Basis Earthquake Ground Motion (DBEGM) Ss").

DBEGM Ss shall be formulated on the following principles.

(1) DBEGM Ss shall be formulated as the following two types of earthquake ground motions in the horizontal and vertical directions on the free surface of the base stratum at the proposed site: The "Earthquake ground motions ((2) below) with the site specific earthquake source locations"; and the "Earthquake ground motions ((3) below) with no such specific source locations.

(2) The DBEGM Ss for the earthquake ground motions with the site specific epicenter shall be formulated on the following principles.
(a) Earthquakes (more than one) are assumed which may have severe impacts to the proposed site, taking account of the characteristics of active faults, the earthquakes experienced in the past and at present in the vicinity, and classifying these earthquakes by their outbreak modes (hereinafter referred to as "Earthquakes for investigation").

(b) Following consideration shall be made concerning the 'characteristics of the active faults around the proposed site' in (a) above.

i) The active faults to be considered in the seismic design shall be identified as the one whose activities since the late Pleistocene epoch can not be denied. The faults can be identified depending upon whether or not the displacement and deformation exist by the faults in the stratum or on the geomorphic surface formed during the last interglacial period.

ii) The active faults shall be thoroughly investigated by integrating geomorphological, geological and geophysical methods, etc. to make clear their locations, shapes, activity characteristics, etc. as a function of the distance from the proposed site.

(c) For each "Earthquake for investigation" selected in (a) above, DBEGM Ss shall be formulated by the following two evaluation methodologies, respectively: i) with the response spectra; and ii) by the method with fault models. In evaluating the earthquake ground motions, sufficient consideration shall be made to the various characteristics due to the earthquake breakout modes, seismic wave propagation channels, etc. (including the regional peculiarities).

i) Evaluation of earthquake ground motions with response spectra

For respective "Earthquakes for investigation," response spectra shall be evaluated by appropriate methods and the design response spectra shall be defined based on these spectra. Earthquake ground motions shall be evaluated appropriately in considering their characteristics such as duration times, time dependent change of amplitude-enveloping curves suitably.

ii) Evaluation of earthquake ground motions by the method with fault models

For respective "Earthquakes for investigation," earthquake ground motions shall be evaluated by setting the epicenter characteristics parameters with appropriate methods.

(d) Uncertainties (dispersion) in formulating the DBEGM Ss as elaborated in (c) above shall be considered by appropriate methods.

(3) The DBEGM Ss for the Earthquake ground motions with no specific epicenters shall be formulated by: collecting the observation records near the epicenter which are obtained from the past earthquakes inside the inland earth's crust, where the correlation of the epicenter and the active faults is difficult to specify; defining the response spectra based on those records by taking into account the ground material characteristics of the proposed site; and with due consideration to the earthquake ground motion characteristics such as the duration time, time dependent change of amplitude-enveloping curves, etc.

(Commentary)

II. Formulation of the DBEGM Ss

(1) Characteristics of the DBEGM Ss.

The Former Guide requested as the design basis earthquake ground motions two categories of Earthquake Ground Motion S1 and S2. The New Guide, however, these two Ground Motions were integrated as the DBEGM Ss, aiming at the enhancement of defining the Earthquakes for Investigation, evaluation of ground motions, etc.

This DBEGM Ss is the premise ground motion for the seismic design to ensure seismic safety of the Facilities. Its formulation requires sufficient checks of its adequacy, with reference to the latest knowledge in specific review cases.

(2) Relevant terminologies in formulating the DBEGM Ss

(a) The 'Free surface of the base stratum' for formulating the design basis earthquake ground motion DBEGM Ss is a hypothetically assumed free surface with no surface layers or structures thereon of the base stratum, which is almost flat with no significant unevenness and with a considerable expanse. The 'Base stratum' here is defined as a solid foundation, not significantly weathered, the shear wave velocity Vs of which exceeds 700m/s.

(b) The 'Active faults' are those faults which have moved repeatedly in the recent geological age and may move in the future, too.

(3) Formulating principles of the DBEGM Ss

(a) In defining the Earthquakes for Investigation, the characteristics of active faults and the records of past earthquakes in the area concerned should be investigated carefully, and comprehensive reviews shall be made on the existing research results concerning the distribution of middle, small and fine sizes of earthquakes in the vicinity of the proposed site, stress fields, modes of earthquake occurrence (including the plate shapes, movement and mutual interactions), etc .

(b) The Earthquakes for Investigation shall be selected according to the following classifications considering the modes of earthquakes etc.

i) Inland Earth's Crust Earthquake

An 'Inland earth's crust earthquake' is an earthquake which occurs in the upper crust earthquake generation layers, including those in the near offshore coasts.

ii) Inter-plate Earthquake

An 'Inter-plate earthquake' is the one which occurs in the interfacial plane of two plates.

iii) Oceanic Plate Earthquake

An 'Oceanic plate earthquake' is the one which occurs inside a subducting (or having subducted) oceanic plate, and is classified into the following two types: An 'earthquake in the subducting oceanic plates,' which occurs near the axis of a sea trench or in its near offshore areas; or an 'earthquake in the subuducted oceanic plates (in-slab earthquakes),' which occurs in the land side of the axis of a sea trench.

(c) In evaluating those earthquakes whose epicenter is near the proposed site and its failure process could have large impacts to the evaluation of the ground motions, the utilization of the fault model should be prioritized.

(d) In considering the 'uncertainties (dispersion) concerned with the formulating process of the DBEGM Ss', the causes of uncertainties (dispersion) and their degrees of possible impacts to the DBEGM Ss shall be duly considered by an appropriate method.

(e) The 'Earthquake ground motions with no specific epicenters' are introduced as the one which should be considered commonly in all application cases irrespective of the detailed investigation results of around the proposed site. This is because even the detailed investigation with due consideration to the geological conditions of the proposed site area can not fully evaluate in advance all probable inland earth's crust earthquakes which could break out near the proposed site.

The justification of thus specified DBEGM Ss should be checked for each application, referring to the most update information. On that occasion, reference should be made to the probabilistic evaluation as needed regarding the ground motions near the epicenter, which are caused by the source faults with no clear traces on the ground surface..

(f) The exceedance probabilities of the 'Earthquake ground motions with or without the site specific epicenter' should be referred to in each safety review case, since it is desirable to grasp, to what extent of exceedance probabilities the response spectra of each seismic ground motion formulated corresponds.

(g) In investigating and evaluating existing materials etc. for the selection of Earthquakes for investigation and formulating the DBEGM Ss, their accuracies should be duly considered and referred to. If the evaluation results are different from the existing ones, their grounds should be accountable.

(h) Peculiar frequency characteristics of the seismic response should be reflected as needed, if found in the grounds which support the Facilities and/or their structures, to the formulation of the DBEGM Ss.

(4) Evaluation of the faults assumed as the epicenter

(a) An in-depth investigation should be made on the active faults, the basis of the evaluation of the faults to be assumed as the epicenter, combining the survey of existing reference materials, tectonic geomorphologic investigation, the earth's surface geological feature investigation, and geophysical investigation, etc. depending on the distance from the proposed site. Especially the area near the proposed site should be investigated precisely and in detail. The extent of the "area near the proposed site" should be defined suitably considering the correlation with the DBEGM Ss formulated as the 'Earthquake ground motions with no specific epicenter'.
(b) Active folds and active flexures, etc. relevant to seismic movement should also be included in the above-mentioned investigation (a) and should be considered in the evaluation of the faults assumed as the epicenter, depending on their properties.
(c) The properties of the faults should be evaluated appropriately by grasping the underground structures etc. in respective regions. Special consideration is required if the earthquakes are assumed from the properties of faults in the area where the faults are not distinctly locatable.
(d) If an empirical formula is used in assuming the magnitude of earthquakes from the fault lengths, etc., the unique features of the empirical formula should be duly considered.
(e) If the investigation of active faults is not powerful enough to collect sufficient information for setting the epicenter characteristics, including their shape evaluation, uncertainties incurred in setting the epicenter characteristics should be duly considered.

6. Seismic Design Philosophy

(1) Primal Policies

The Facilities shall be designed to fulfill the following primal policies of the seismic design for respective seismic Classes.

(a) The Facilities in Class S shall maintain their safety functions under the seismic forces caused by the DBEGM Ss. Furthermore, they shall bear the seismic forces caused by the "Elastically Dynamic Design Earthquake Ground Motion Sd (EDEGM Sd)" and the static seismic forces (defined below).
(b) The Facilities of Class B shall bear the static seismic forces shown below. Furthermore, those Facilities, which may resonate with earthquakes, shall be evaluated for its influence.
(c) The Facilities of Class C shall bear the static seismic forces shown below.
(d) The integrity of the Facilities in the upper Class shall not be impaired by the damages of the lower Class Facilities.

(2) Definition of Seismic Forces

Seismic forces for the seismic design of the Facilities shall be defined in the following way.

(a) Seismic forces caused by the DBEGM Ss

Seismic forces due to the DBEGM Ss shall be defined by appropriately combining the DBEGM Ss in horizontal and vertical directions.

(b) Seismic forces caused by the EDEGM Sd

The EDEGM Sd shall be established with the engineering judgments based on the DBEGM Ss. And the seismic forces caused by the EDEGM Sd shall be also defined by appropriately combining the horizontal seismic forces with the vertical seismic forces.

(c) Static seismic forces

Static seismic forces shall be defined as in the following.

i) Buildings and structures

Horizontal seismic forces shall be defined by multiplying the seismic story shear coefficient Ci by the following factors corresponding to the importance classification of the facilities, and further multiplying the weight above the story concerned.

Class S 3.0

Class B	1.5
Class C	1.0

Here, the seismic story shear coefficient Ci shall be obtained from the standard shear coefficient Co as 0.2, taking into account the vibration characteristics of the buildings and structures, geological categories of the ground, etc.

As for the facilities of Class S, horizontal and vertical seismic forces shall be assumed to work simultaneously in the adverse directions. The vertical seismic forces shall be defined by the vertical seismic intensity which is obtained from the reference seismic intensity of 0.3, and by considering the vibration characteristics of the buildings and structures, geological categories of the ground, etc. The vertical seismic intensity is assumed to be constant over the height.

ii) Components and piping system

The seismic forces of respective Classes shall be defined by multiplying the above-mentioned seismic story shear coefficient Ci and the factors corresponding to the importance classification of the Facilities as the horizontal seismic intensity, and by increasing 20% the horizontal seismic intensity concerned and the above-mentioned vertical seismic intensity, respectively.

Horizontal and vertical seismic forces shall be assumed to work simultaneously in the adverse directions. The vertical seismic intensity shall be assumed to be constant, however, over the height.

(Commentary)

III. Design Principles

(1) the necessity of establishing the EDEGM Sd

The Former Guide defined two categories of Earthquake Ground Motions S1 and S2, corresponding to the seismic importance classifications of the buildings, structures, components and piping systems. The New Guide, however, defines only one Design Base Earthquake Ground Motion DBEGM Ss

The basic principle in the seismic design is to ensure maintaining seismic safety functions of the seismically important Facilities under the seismic forces by this DBEGM Ss. The elastically dynamic earthquake ground motion (EDEGM) Sd is additionally defined to ensure, with higher confidence, maintaining seismic safety functions of the Facilities under this DBEGM Ss. The EDEGM Sd is closely related with the DBEGM Ss from the engineering standpoint.

(2) Formulation of the EDEGM Sd

Article 6 of this New Guide requires the Facilities 'to bear the seismic forces,' which means that the Facilities are designed in the elastic range as a whole against certain seismic forces. Here, "design in the elastic range" means to limit the stress of individual Facility components below the allowable limits by the stress analysis of the Facilities as an elastic body. The above-mentioned allowable limits do not imply the elastic limits in the strict definition. It is allowable, if the Facilities remain in the elastic range on the whole even though part of the Facilities exceeds the elastic range.

The New Guide requires each Class S Facility 'to bear the seismic forces' by the EDEGM Sd, which is established based on the engineering judgment. The "elastic limit condition" is the condition that the impacts of the Earthquake Ground Motions on the Facilities and the subsequent consequences of the Facilities can be evidently evaluated. Maintaining the seismic safety functions of the Facilities can be made more confident under the seismic forces by the DBEGM Ss, by confirming that the Facilities retain the elastic limit condition as a whole under the seismic forces by the EDEGM Sd. In other words, the EDEGM Sd assumes a part of the roles which the Design Earthquake Ground Motion S1 of the Former Guide played in the seismic design.

The EDEGM Sd should be established by multiplying the DBEGM Ss by engineering coefficients defined for individual Facilities and their composing elements in consideration of the ratio of the input seismic loads to the safety functional limits and the elastic limits. In defining the engineering coefficients, reference can be made to the exceedance probability used in the formulation of the DBEGM Ss.

Specific values and their grounds of the EDEGM Sd thus formulated should be made clearly accountable in respective specific application cases.

The ratio of the response spectra of the EDEGM Sd and the DBEGM Ss (Sd/Ss) should be adequately large in considering the characteristics required to EDEGM Sd. Its target value should be not less than 0.5.

The EDEGM Sd may be established for individual components of the Facilities depending on their specific characteristics to be considered in seismic design.

The Clause 6(1)(b) above requests that those Class B Facilities, which may resonate with earthquakes, shall be evaluated for its influence. The earthquake ground motion for this evaluation may be established by multiplying the EDEGM Sd by a factor of 0.5.

(3) Calculation of the seismic forces by the DBEGM Ss and the EDEGM Sd

In calculating the seismic forces due to the DBEGM Ss and the EDEGM Sd by the seismic response analysis, the appropriate analytical methods should be selected in consideration of its applicability and limitations, etc. and adequate investigation should be made to set appropriate conditions for analysis.

When the 'free surface of the base stratum' is significantly deep as compared with the Facilities foundations, the amplification characteristics of the ground motions by the ground above the base stratum should be investigated sufficiently and be reflected to the evaluation of the seismic response as needed.

(4) Static seismic forces

The static seismic forces for the buildings and structures should be calculated as shown (a) and (b) below.

The buildings and structures should be checked so that they reserve the adequate safety margin of retained horizontal strengths against the necessary strengths depending on the importance of the Facilities. The retained horizontal strengths required should be calculated as in (c) below.

(a) Horizontal seismic forces

i) The datum plane for calculating the horizontal seismic forces should be the ground surface in principle. If it is necessary to consider the characteristics of the building and the structures such as their constitutions or their correlation to the surrounding grounds, an alternative appropriate datum plane should be defined and be reflected to the calculation.

ii) Horizontal seismic forces on the above-the-datum-plane parts of the Facilities should be obtained as the total seismic forces acting on the part concerned depending on its elevation. The following formula should be used in the calculation.

$Qi = n \cdot Ci \cdot Wi$

where,

Qi: Horizontal seismic forces acting on the part above the datum plane,

n: Coefficients depending on the importance classifications of the Facilities (3.0 for Class S, 1.5 for Class B and 1.0 for Class C).

Ci: Seismic story shear coefficients, given by

$Ci = Z \cdot Rt \cdot Ai \cdot Co$,

where,

Z: Seismic Zone factor (1.0 regardless of the region),

Rt: Vibration characteristic factors of the buildings, to be obtained pursuant to the appropriate standards and codes safety, where the 'appropriate

standards and codes for safety' corresponds to the Building Standard Law, etc. However, if a different value, representing the vibration characteristics of the buildings and/or the structures, is obtained in consideration of their structural properties, the seismic response characteristics and the ground properties, and if the value is lower than that obtained by the method specified by the Building Standard Law, etc., Rt could be reduced to this value, but not less than 0.7.

Ai: Factors representing the vertical distribution of seismic story shear coefficients, to be calculated, like Rt, by the appropriate standards, codes or the alternative appropriate methods, and

Co: Standard shear coefficient (0.2),

Wi: Total of dead loads and live loads supported by the part in question.

iii) Horizontal seismic forces on the below-the-datum-plane parts of the Facilities should be evaluated by the following formula.

$Pk = n \cdot k \cdot Wk$,

where,

Pk: Horizontal seismic forces acting on the subject part,

n: Coefficients depending on the importance Classifications of the Facilities (3.0 for Class S, 1.5 for Class B and 1.0 for Class C).

k: Horizontal seismic coefficients given by

$$k \geqq 0.1 \cdot \left[1 - \frac{H}{40}\right] \cdot Z,$$

where

H: Depth of the subject part below the datum plane (in meters), 20m maximum (20m for all parts deeper than 20 meters), and

Z: Seismic Zone factor (1.0, regardless of the region), and

Wk: Sum of the dead loads and live loads of the subject part concerned.

If the vibration characteristics could be appropriately calculated in consideration of the structural characteristics of the buildings and structures, the seismic response characteristics and the ground properties, the calculated value could be used instead.

(b) Vertical seismic forces

The vertical seismic forces in evaluating the static forces to the Class S Facilities should be obtained by the vertical seismic intensity given by

$Cv = Rv \cdot 0.3$,

where

Cv: Vertical seismic intensity, and

Rv: A factor representing the vertical vibration characteristics of the buildings (1.0). However, if a value less than 1.0 is verified based on the special investigation or study, Rv could be reduced to the value (but not less than 0.7).

(c) Retained horizontal strengths required

Retained horizontal strengths required should be defined by the method specified in the 'appropriate standards and codes for safety,' which refers to the Building Standard Law, etc.

In evaluating the retained horizontal strengths required, the seismic importance dependent coefficients to be multiplied by the seismic story shear coefficient should be set as 1.0 in all Earthquake-proof cases, Class S, B and C, and the standard shear force coefficient Co should be 1.0.

7. Load Combination and Allowable Limits

Following are the basic concepts of combining of loads and allowable limits which shall be considered in assessing the adequacy of seismic safety design policies.

(1) Buildings and Structures

(a) Class S Buildings and Structures

i) Load combination with the DBEGM Ss and allowable limits

Under the combined loads of standing and operating conditions with the seismic forces due to the DBEGM Ss, the buildings and structures concerned shall have sufficient margin of deformation acceptability (deformation at the ultimate strengths) as the total system, and adequate safety margin against the ultimate strengths of the buildings and structures.

ii) Load Combination with the EDEGM Sd and allowable limits

The allowable limits shall be defined by the allowable unit stresses specified in competent standards and codes for safety under the combined loads of the normal and operating conditions with the seismic loads due to the EDEGM Sd or Static seismic forces and their consequent stresses. .

(b) Class B or Class C Buildings and Structures

Same as above (a)-ii) under the combined loads of normal and operating conditions with the Static seismic forces and their consequent stresses.

(2) Components and Piping Systems

(a) Class S Components and Piping Systems

i) Load Combination with the DBEGM Ss and allowable limits

The functions of the Facilities shall not be impaired by the excessive deformations, cracks or failures, even when the most part of structures would reach their yield conditions for plastic deformation under the combined loads of normal operating conditions, anticipated transient conditions or accident conditions with the seismic loads due to the DBEGM Ss, and their consequent stresses. The allowable limits for the active components etc. shall be established by the acceleration limits etc. for retaining of necessary functions, which are verified by the tests etc. under the response acceleration due to the DBEGM Ss.

ii) Load Combination of EDEGM Sd and allowable limits

The allowable limits shall be established by the yield stress or the stress with equivalent safety, under the combined loads at normal operating conditions, anticipated transient conditions or accident conditions, and the seismic loads due to the EDEGM Sd or the Static seismic forces.

(b) Class B or Class C Components and Piping Systems

The allowable limits shall be established by the yield stress or the stress with equivalent safety, under the combined loads in normal operating conditions or anticipated transient conditions, and the seismic loads due to the Static seismic forces.

(Commentary)

IV. Load Combination and Allowable Limits

(1) In considering the 'respective loads under anticipated transient and accident conditions', the loads by the possible earthquake-originated events and the long-standing loads in the wake of accidents shall be combined with the seismic loads, even if the accidents are not caused directly by the earthquakes .

However, the loads under accident conditions may not be necessary to consider combining with the seismic loads, if the probability of their concurrent loads are extremely low when considering the occurrence probability of this accidental event, its duration time, and the exceedance probability of the earthquake.

(2) The "competent standards and codes" to specify the allowable unit stress, being referred to in defining the allowable limits for the combined loads of buildings and structures with the EDEGM Sd, etc. (7(1)(a)-ii) above), are specifically the Building Standard Law, etc.

(3) The "Ultimate strengths' in the clause 7(1)(a)-i) above regarding the combined loads of the buildings and structures with the DBEGM Ss means the bounding maximum bearing loads, under which deformation and strain of the structures would increase dramatically, an ultimate

condition of the structures, when the loads to the structure are added gradually.

(4) The "yield stress or the stress with equivalent safety" is required concerning the allowable limits of components and piping systems (7(2)(a)-ii) above). Specifically this refers to the 'Technical Standards on Structures of Nuclear Power Generation Facilities,' etc., being prescribed in the Electricity Utilities Industry Law.

8. Consideration of the accompanying events of earthquakes

The Facilities shall be designed with sufficient consideration to the accompanying events of earthquakes in the following terms.

(1) Safety functions of the Facilities shall not be significantly impaired in the seismic events by the possible collapses of the surrounding grounds above the foundations.

(2) Safety functions of the Facilities shall not be significantly impaired by tsunami which could be reasonably postulated to hit in a very low probability in the service period of the Facilities.

Hopkins, Jon

NRR

From: Hopkins, Jon
Sent: Thursday, March 17, 2011 2:08 PM
To: Cullingford, Michael
Subject: RE: Some Seismic Safety Criteria of Japan Nuclear Safety Commission (NSC)

Thanks, Mike.

From: Cullingford, Michael
Sent: Thursday, March 17, 2011 10:55 AM
To: Hopkins, Jon
Subject: FW: Some Seismic Safety Criteria of Japan Nuclear Safety Commission (NSC)

fyi

From: Bagchi, Goutam / NRO
Sent: Thursday, March 17, 2011 10:53 AM
To: NRO_DSER Distribution
Cc: Kammerer, Annie; Burnell, Scott; Cullingford, Michael; Ali, Syed; Hogan, Rosemary
Subject: Some Seismic Safety Criteria of Japan Nuclear Safety Commission (NSC)

~~**This information is for Official Use Only**~~

Dear Colleagues,

Those of you that are interested in getting more technical information may want to browse through some of the attached files of regulatory guides (RG) published by the Japan Nuclear Safety Commission (NSC). In this message I am trying to present what I gleaned from the RGs. Please note that the front pages of the RGs may show the original publication dates, such as 1978 etc., inside pages should show the latest revision dates – 2006, 2009 etc.

- **Siting Review Criteria**: Focuses on proximity to population zone and potential radiation impact, not site suitability from natural hazards (hydrology, meteorology or Seismology stand point)
- **Safety Classification:** Divided into classes 1, 2 and 3. Required function for Class 3 are) Functions to mitigate reactor pressure increase
  2) Functions to suppress reactor power increase
  3) Functions to make up reactor coolant

W/182

Safety Class 3 design philosophy, "Class 3: Ensure and maintain reliability equivalent to or higher than that of ordinary industrial facilities"

- Seismic Design: Safety Class 3 SSCs are designed to static forces with varying numbers of safety factors from 3 to 1.0

Japan's seismic design of structures for resistance ground vibration is very robust -2007 July event at Kashiwazaki shows this. Vibratory ground motion and tsunami from large earthquakes are relatively frequent events in Japan and they occur simultaneously. At this point I am not clear as to the extent to which the older vintage plants considered the combined effects. I do not know what back fits were implemented at the Fukushima like plants when the NSC upgraded its seismic criteria in 2006 (?)

Another factor seems to be qualification of electrical and mechanical equipment in mild and harsh environments, as is required under 10 CFR 50.49. At Fukushima the electrical safety systems (cables?) became wet ad did not work even when the diesel generator worked for about an hour.

There are very significant differences in the way reactor oversight is conducted – review of maintenance and in-service inspection of safety related SSCs (10 CFR 50.55a imposes ASME Code criteria to ISI).

Please forgive me, I messed up the formatting in the bulleted portion of the text above. Regards,

Thank you,
Goutam Bagchi

Scott, Michael

From: Scott, Michael
Sent: Thursday, March 17, 2011 4:50 PM
To: Tene, Kimberly
Subject: FW: THANK YOU and ACTION: Sample Speaker Thank you Letter and Template for Unanswered Session Questions
Attachments: image001.jpg; Sample Speaker TY Ltr.doc; Sample Format for Qs&As.docx

Importance: High

Assume you already have this.

The person I called has not yet returned my call.

From: Langlie, Liz
Sent: Thursday, March 17, 2011 1:00 PM
To: Prescott, Paul; Hall, Victor; Zhang, Deanna; Rebstock, Paul; Hilton, Nick; Cool, Donald; Dehmel, Jean-Claude; Jankovich, John; Poole, Brooke; Dube, Donald; Lois, Erasmia; Stutzke, Martin; Hudson, Daniel; Drouin, Mary; Nove, Carol; Scarbrough, Thomas; Lee, Mike; Dean, Bill; McCree, Victor; Satorius, Mark; Collins, Elmo; Denissen, Christie; Munson, Clifford; Ake, Jon; Manoly, Kamal; Kokajko, Lawrence; Miller, Kenn; Daley, Robert; Tappert, John; Casto, Chuck; Kahler, Robert; Dozier, Jerry; Imboden, Andy; Stone, AnnMarie; Galloway, Melanie; Howe, Andrew; Tjader, Theodore; Mrowca, Lynn; Sieracki, Diane; Cheok, Michael; Cai, June; Dion, Jeanne; Pederson, Perry; Costello, Ralph; Hiser, Allen; Carpenter, Gene; Frumkin, Daniel; Held, Wesley; Scales, Kerby; Roquecruz, Carla; Concepcion, Milton; Day, Kerstun; Shaffer, Vered; Cullingford, Michael; Bailey, Stewart; Cloyd, SherVerne; Tetter, Keith; Moyer, Carol; Carpenter, Robert; Stevens, Gary; Kennedy, James; Barkley, Richard; Markley, Michael; Doolittle, Elizabeth; Som, Swagata; Rivera-Varona, Aida; Mroz (Sahm), Sara; Sangimino, Donna-Marie; Drucker, David; Evans, Jonathan; Thompson, Catherine; Cai, June; Emche, Danielle; VandenBerghe, John; Tregoning, Robert; Oudinot, Daniele; Mills, Daniel; Gall, Jennifer; Calvo, Antony; Anooshehpoor, Rasool; Miller, Barry; Sakai, Stacie; Williams, Donna; Cartwright, William; Tene, Kimberly; Sallman, Ahsan; Sall, Basia; Reed, Wendy; Snyder, Amy; Cupidon, Les; Shropshire, Alan; Chang, Richard; Barrett, Harold; Xu, Jim; Lu, Shanlai; Park, Sunwoo; Hernandez, Raul; Gall, Jennifer; Ruland, William; Zigh, Ghani; Gingrich, Chester; Whitman, Josh; Esmaili, Hossein; Gibson, Kathy; Brock, Terry; Khanna, Meena; Klein, Paul; Hardies, Robert; Kozal, Jason; Powell, Raymond; Pederson, Cynthia; Guthrie, Eugene; Daley, Robert; Vegel, Anton; Brown, Frederick; Kelly, Joseph; Srinivasan, Makuteswara; Lobel, Richard; Laur, Steven; Mitchell, Reggie; Rheaume, Cynthia; Noggle, James; Libby, Earl; Case, Michael; Mizuno, Geary; Benowitz, Howard; Whitney, James; Schnetzler, Bonnie; Giantelli, Adelaide; Barry, Terrence; Chang, Richard; Schaperow, Jason; Tinkler, Charles; Santiago, Patricia; Patel, Jigar
Cc: Givvines, Mary; Kipfer, Lorna; Oliveto, Betsy; Reckley, William; Murphy, Martin; Sydnor, Russell; Zimmerman, Roy; Bush-Goddard, Stephanie; Cullingford, Michael; Ruland, William; Karlin, Alex; Demoss, Gary; Norris, Wallace; Camper, Larry; Virgilio, Martin; Markley, Michael; Haney, Catherine; Wilson, George; Tappert, John; McDermott, Brian; Sheron, Brian; Holian, Brian; Harrison, Donnie; Elliott, Robert; Campbell, Andy; Doane, Margaret; Erlanger, Craig; Case, Michael; Klein, Alex; Mrowca, Lynn; Ulses, Anthony; Uhle, Jennifer; Gibson, Kathy; Gavrilas, Mirela; Virgilio, Martin; Holahan, Gary; Morris, Scott; Pederson, Cynthia; Scott, Michael; Dennig, Robert; Dyer, Jim; Nicholson, Thomas; Matthews, David; Johnson, Clay; Coffin, Stephanie; Bonaccorso, Amy; Anderson, Patricia; Schum, Constance; Wright, Jason; Padilla, William; Doan, Brian; Coates, Carlotta; Emche, Danielle; Doolittle, Elizabeth; Galloway, Melanie; Case, Michael; Dudes, Laura; Lorson, Raymond; Cullingford, Michael; Machalek, Woody; Wilson, George; Knowles, Eric; Valentin, Andrea; Betsy Oliveto
Subject: THANK YOU and ACTION: Sample Speaker Thank you Letter and Template for Unanswered Session Questions
Importance: High

Dear Session Coordinators and Chairs,

The 2011 RIC was very successful and I thank you on behalf of Lorna Kipfer, Betsy Oliveto and the RIC Planning Committee for greatly adding to that success! We have received many compliments on the technical session content and we appreciate the hard work you and your speakers put into making RIC sessions educational, timely and interesting.

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It is now time for conference wrap up actions, which include thanking all speakers for their participation and responding to unanswered session questions, which will be posted on the RIC website. Attached is a sample speaker thank you letter for your reference – feel free to customize the letter to meet your needs. Please send thank you notes to your speakers in the next couple of weeks and let us know via email when this action has been completed – *we do not need to be copied on thank you notes.* Feel free to send your thank you letters via regular mail or email.

Also attached is a question and answer template. If you have unanswered questions from your session, please respond in the *Option A* format listed on the attached template; or, if all questions were answered at your session onsite, please respond in the *Option B* format. Please send your responses to me at liz.langlie@nrc.gov by March 23.

Our goal is to have audio and video of plenary sessions, audio of technical sessions, transcripts for plenary and technical sessions, updated technical presentations and unanswered questions on the external website by the end of March. We understand that it is an extremely busy time for many of you as a result of the Japan earthquake and tsunami, so please let us know if you are unable to send responses to unanswered questions by March 23.

I enjoyed working with each of you on the RIC technical sessions this year and I hope to work with you again on RIC 2012! Please don't hesitate to contact me or Lorna Kipfer if you have any questions and thank you again for your efforts to make the RIC such a successful conference.

Best,
Liz

Liz Langlie
Program Specialist, NRR/PMDA
U.S. Nuclear Regulatory Commission (NRC)
301/415-7237
O-13E9
liz.langlie@nrc.gov

RIC 2011
Marriott Bethesda North
Hotel & Conference Center
March 8–10

SAMPLE THANK YOU LETTER TO TECHNICAL SESSION SPEAKERS

DATE

NAME
TITLE
ORGANIZATION
ADDRESS

Dear Mr./Mrs./Ms. _____:

Thank you for presenting at the U.S. Nuclear Regulatory Commission's 23rd Annual Regulatory Information Conference (RIC), March 8 – 10, 2011, in Rockville, Maryland. This year the total number of participants reached over 2,900 participants including international representatives from 28 countries.

Initial feedback from participants indicates that this year's RIC was another resounding success. Your dedication and support helps the NRC "raise the bar" each year to develop a comprehensive program filled with discussion topics that are timely and relevant.

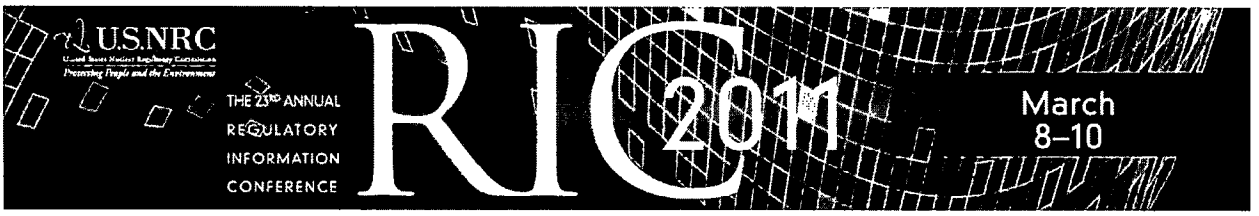
Your presentation on "__(speaker presentation title)_____" during the ___(session number and title)_____ session provided important information and another perspective about initiatives that are underway in the nuclear arena. [optional: *The interest of the attendees was evident by the range of questions raised during the question-and-answer period following the panel presentations.]*

All final presentation slides and questions that were not addressed during the conference are being compiled and will be posted on the NRC's RIC website at: http://www.nrc.gov/public-involve/conference-symposia/ric/index.html. Again, thank you for your participation at NRC's 2011 Regulatory Information Conference. It is your commitment and support that helped to make the RIC a success.

We hope you will join us for the 24th Annual RIC March 13-15, 2012, scheduled to be held at the Bethesda North Marriott Hotel and Conference Center, Rockville, Maryland.

Warm regards,

Session Chair or Coordinator (as appropriate)



SUGGESTED FORMATS FOR PROVIDING QUESTIONS AND ANSWERS

Option A - Please follow the sample format below for sessions that have unanswered questions:

Session Day and Time: *[ex: Tuesday, March 8, 1:30 p.m. - 3:00 p.m.]*

Session Number and Title: *[ex: T1 10 CFR Part 21 and Commercial-Grade Degradation]*

Session Chair: *[enter name and office of Session Chair]*

Session Coordinator: *[enter name, office, telephone number and email address of Session Coordinator]*

Question 1:

Answer 1:

Question 2:

Answer 2:

Option B - Please follow the sample format below for sessions where all the questions received were answered during the session:

Session Day and Time: *[ex: Tuesday, March 8, 1:30 p.m. - 3:00 p.m.]*

Session Number and Title: *[ex: T1 10 CFR Part 21 and Commercial-Grade Degradation]*

Session Chair: *[enter name and office of Session Chair]*

Session Coordinator: *[enter name, office, telephone number and email address of Session Coordinator]*

All questions received were answered during the session.

Greenwood, Carol

From: Gibson, Kathy
Sent: Thursday, March 17, 2011 4:56 PM
To: Ramirez, Annie
Cc: Armstrong, Kenneth
Subject: RE: Request for info
Attachments: Kathy Halvey Gibson.vcf

Thanks Annie, Ken can you add Annie's info to the spreadsheet?

-----Original Message-----
From: Ramirez, Annie
Sent: Wednesday, March 16, 2011 5:53 PM
To: Gibson, Kathy
Cc: Armstrong, Kenneth
Subject: RE: Request for info

I apologize for the delay on the answer but I have been caught in training all week. I will be more than willing to provide assistance at the OpCenter, and it could be any shift (I live close by HQ). Although it will be a great exposure experience I recognize I have not that much into depth of experience to go to Japan and help.

I am a Chemical Engineer with mild experience in T/H and severe accidents.

Thanks!

Annie

-----Original Message-----
From: Gibson, Kathy
Sent: Wednesday, March 16, 2011 8:59 AM
To: RES_DSA
Subject: Request for info
Importance: High

It seems I need to clarify my information request.

Please let Ken know 3 things:

Are you willing to work in the Ops Center (if asked)? If so what shifts?

Are you willing to go to Japan (if asked)?

We need this by noon.
What is your area of expertise?

W184

Schaperow, Jason

From: Schaperow, Jason
Sent: Thursday, March 17, 2011 2:02 PM
To: Chang, Richard
Cc: Tinkler, Charles
Subject: RE: From Kathy

O.K. Also, Charlie and I talked to Kathy about the following issue:

Randy Gauntt is on the hook to teach the Reactor Safety Course (together with Dana Powers) here at the NRC next week. He will be flying here on Sunday and will be teaching the course all week. We recommended to Kathy that someone replace Randy in teaching this course, so that Randy could be available to work on the Fukushima Daiichi accident response. She said she would take the lead in working on this issue.

From: Chang, Richard
Sent: Thursday, March 17, 2011 1:57 PM
To: Schaperow, Jason
Subject: RE: From Kathy

Jason,

Talked to Charlie about it, and he told me he would take care of it.

Thanks,
Richard

From: Schaperow, Jason
Sent: Thursday, March 17, 2011 1:53 PM
To: Chang, Richard
Subject: RE: From Kathy

O.K.

From: Chang, Richard
Sent: Thursday, March 17, 2011 12:23 PM
To: Schaperow, Jason; Tinkler, Charles
Subject: From Kathy

Charlie and Jason,

I just got word from Kathy:

She does not want any MACCS2 calculations from Sandia; and she does NOT want Nate going home to Sandia because of us.

Thanks,
Richard Chang
Program Manager
RES/DSA/SPB
301-251-7980

W185

Schaperow, Jason

From: Schaperow, Jason
Sent: Thursday, March 17, 2011 11:00 AM
To: Nakanishi, Tony
Cc: Tinkler, Charles; Chang, Richard; Wagner, Katie
Subject: RE: Use of sand/water for 1F4 SFP

Your question will be forwarded to the Ops Center for them to address. Thanks, Jason

---

From: Nakanishi, Tony
Sent: Thursday, March 17, 2011 8:44 AM
To: Schaperow, Jason
Cc: Tinkler, Charles; Chang, Richard
Subject: Re: Use of sand/water for 1F4 SFP

It's 9:40 pm Thursday. I could call you if you'd like.

From: Schaperow, Jason
To: Nakanishi, Tony
Cc: Tinkler, Charles; Chang, Richard
Sent: Thu Mar 17 08:19:55 2011
Subject: RE: Use of sand/water for 1F4 SFP

We are thinking about your question. What time and day is it now in Tokyo?

From: Nakanishi, Tony
Sent: Thursday, March 17, 2011 7:11 AM
To: Schaperow, Jason
Subject: Use of sand/water for 1F4 SFP

Hi Jason,
I am in Tokyo as a part of the the NRC delegation. I spoke with Eva Brown earlier. Please send me any info on the evaluating the use of sand/water for the Unit 4 SFP.
Thanks,
Tony

W/186

Schaperow, Jason

From: Schaperow, Jason
Sent: Thursday, March 17, 2011 1:54 PM
To: Wagner, Katie
Subject: RE: Use of sand/water for 1F4 SFP

Thanks.

From: Wagner, Katie
Sent: Thursday, March 17, 2011 1:35 PM
To: HOO Hoc
Cc: Schaperow, Jason
Subject: FW: Use of sand/water for 1F4 SFP

Ops Personnel,

I have been directed by management to forward this email to you.

Thanks,

Katie Wagner
General Engineer
U.S. Nuclear Regulatory Commission
(301) 251.7917
Katie.Wagner@nrc.gov

From: Schaperow, Jason
Sent: Thursday, March 17, 2011 11:03 AM
To: Wagner, Katie
Subject: FW: Use of sand/water for 1F4 SFP

Hi Katie,
Kathy Gibson directed me to send the question below to you. Tony Nakanishi is an NRC employee who is now assigned to be in Tokyo. My understanding is that you will be forwarding this email with the question below to the NRC Operations Center for them to address. Please send me an email to confirm that you have done this.

Thanks,
Jason

From: Nakanishi, Tony
Sent: Thursday, March 17, 2011 8:44 AM
To: Schaperow, Jason
Cc: Tinkler, Charles; Chang, Richard
Subject: Re: Use of sand/water for 1F4 SFP

It's 9:40 pm Thursday. I could call you if you'd like.

From: Schaperow, Jason
To: Nakanishi, Tony
Cc: Tinkler, Charles; Chang, Richard
Sent: Thu Mar 17 08:19:55 2011
Subject: RE: Use of sand/water for 1F4 SFP

W/182

We are thinking about your question. What time and day is it now in Tokyo?

From: Nakanishi, Tony
Sent: Thursday, March 17, 2011 7:11 AM
To: Schaperow, Jason
Subject: Use of sand/water for 1F4 SFP

Hi Jason,
I am in Tokyo as a part of the the NRC delegation. I spoke with Eva Brown earlier. Please send me any info on the evaluating the use of sand/water for the Unit 4 SFP.
Thanks,
Tony

Schaperow, Jason

From: Schaperow, Jason
Sent: Thursday, March 17, 2011 1:55 PM
To: Wagner, Katie
Subject: RE: Use of sand/water for 1F4 SFP

O.K. Thanks.

From: Wagner, Katie
Sent: Thursday, March 17, 2011 1:50 PM
To: Schaperow, Jason
Subject: RE: Use of sand/water for 1F4 SFP

Jason,

I apologize for the delay in forwarding the email, I just read it. In the future if something that looks this urgent comes in please feel free to add the "High Priority" designation for the email or call me.

Thanks,
Katie

From: Schaperow, Jason
Sent: Thursday, March 17, 2011 11:03 AM
To: Wagner, Katie
Subject: FW: Use of sand/water for 1F4 SFP

Hi Katie,
Kathy Gibson directed me to send the question below to you. Tony Nakanishi is an NRC employee who is now assigned to be in Tokyo. My understanding is that you will be forwarding this email with the question below to the NRC Operations Center for them to address. Please send me an email to confirm that you have done this.

Thanks,
Jason

From: Nakanishi, Tony
Sent: Thursday, March 17, 2011 8:44 AM
To: Schaperow, Jason
Cc: Tinkler, Charles; Chang, Richard
Subject: Re: Use of sand/water for 1F4 SFP

It's 9:40 pm Thursday. I could call you if you'd like.

From: Schaperow, Jason
To: Nakanishi, Tony
Cc: Tinkler, Charles; Chang, Richard
Sent: Thu Mar 17 08:19:55 2011
Subject: RE: Use of sand/water for 1F4 SFP

We are thinking about your question. What time and day is it now in Tokyo?

From: Nakanishi, Tony
Sent: Thursday, March 17, 2011 7:11 AM

W/188

To: Schaperow, Jason
Subject: Use of sand/water for 1F4 SFP

Hi Jason,
I am in Tokyo as a part of the the NRC delegation. I spoke with Eva Brown earlier. Please send me any info on the evaluating the use of sand/water for the Unit 4 SFP.
Thanks,
Tony

Greenwood, Carol

From: Gibson, Kathy
Sent: Thursday, March 17, 2011 11:54 AM
To: Armstrong, Kenneth
Subject: Fw: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing

---

From: Schaperow, Jason
To: Gibson, Kathy
Sent: Thu Mar 17 11:18:49 2011
Subject: RE: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing

I am NOT interested in going to Japan.

From: Gibson, Kathy
Sent: Wednesday, March 16, 2011 8:06 AM
To: RES_DSA
Subject: Fw: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing
Importance: High

More info on staffing the Ops Center.

Please provide the information I requested previously on your willingness to help. If you are not interested, unavailable or don't have relevant expertise to work in the Ops Center or go to Japan, please send a negative reply so we have a full accounting for the division.

Thanks!

From: Sheron, Brian
To: Case, Michael; Coe, Doug; Correia, Richard; Gibson, Kathy; Lui, Christiana; Richards, Stuart; Sangimino, Donna-Marie; Scott, Michael; Uhle, Jennifer; Valentin, Andrea
Sent: Wed Mar 16 07:41:18 2011
Subject: FW: Follow-up from 4 pm teleconference on Ops Center Long Term Staffing

Here is the list of expertise the Op center is looking for.

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,

W/189

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

Schaperow, Jason

From: Schaperow, Jason
Sent: Thursday, March 17, 2011 11:46 AM
To: Armstrong, Kenneth
Subject: FW: Request for info

Importance: High

I am NOT interested in going to Japan. (Sorry I am so late in responding.)

-----Original Message-----
From: Gibson, Kathy
Sent: Wednesday, March 16, 2011 8:59 AM
To: RES_DSA
Subject: Request for info
Importance: High

It seems I need to clarify my information request.

Please let Ken know 3 things:

Are you willing to work in the Ops Center (if asked)? If so what shifts?

Are you willing to go to Japan (if asked)?

We need this by noon.
What is your area of expertise?

w/190

Lee, Richard

From: Salay, Michael
Sent: Thursday, March 17, 2011 9:32 AM
To: Lee, Richard
Subject: Liner melt through documents

Link for liner melt-through: http://www.osti.gov/bridge/purl.cover.jsp?purl=/10107249-6WNNci/native/

Michael Salay
United States Nuclear Regulatory Commission
Washington, DC 20555
MS: C3-C07M
michael.salay@nrc.gov
tel: 301-251-7543
fax: 301-251-7436

W/191

Schaperow, Jason

From: Schaperow, Jason
Sent: Thursday, March 17, 2011 8:39 AM
To: Gibson, Kathy
Cc: Tinkler, Charles; Chang, Richard; Gonzalez, Sergio
Subject: RE: MACCS Code

Hi Kathy,

I spoke with Charlie at 10:00 last night. He said he checked and MACCS can calculate out to 8000 miles. We usually run it out to 1000 miles. Validation out beyond 30 miles or so gets to be questionable.

Yesterday, Sandia got source terms together for a MACCS calculation. We think we are now in pretty good shape for some MACCS calculations. However, it appears that our key MACCS expert (Nate Bixler) is on travel, possibly here in the DC area. Richard and I are tracking him down now, and should be able to find him once it is around 8:00 Mountain Time (Albuquerque).

Jason

From: Gonzalez, Sergio
Sent: Thursday, March 17, 2011 8:29 AM
To: Chang, Richard; Schaperow, Jason; Nosek, Andrew; Navarro, Carlos
Cc: Santiago, Patricia
Subject: MACCS Code

Good Morning:

Kathy wants to now by 8:30am

How far out can MACCS calculate? What is the limitation? Validation data?

Thanks,

Sergio E. Gonzalez

Program Manager (NSPDP), Special Projects Branch
Division of Systems Analysis
Office of Nuclear Regulatory Research
Phone- 301-251-7453
Sergio.Gonzalez@nrc.gov

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Satorius, Mark

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

Richard Turtil
State Liaison – Liaison Team
Incident Response Center

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Schaperow, Jason

From: Schaperow, Jason
Sent: Thursday, March 17, 2011 11:14 AM
To: Hasselberg, Rick
Subject: RE: Emergency Response Work Schedule - Expanded Compressed CBA, 6.10.3

Thanks for thinking of me. Kind of crazy right now, isn't it.

From: Hasselberg, Rick
Sent: Tuesday, March 15, 2011 2:22 PM
To: Schaperow, Jason
Subject: FW: Emergency Response Work Schedule - Expanded Compressed CBA, 6.10.3

FYI -

From: NTEU, Dale Yeilding
Sent: Tuesday, March 15, 2011 1:08 PM
To: McDermott, Brian; Weber, Michael
Cc: Hasselberg, Rick; Sullivan, Randy; Bolduc, Angela; Buchholz, Jeri; Wiggins, Jim; Davidson, Lawrence; Muessle, Mary; Mamish, Nader; Fopma, Melody
Subject: Emergency Response Work Schedule - Expanded Compressed CBA, 6.10.3

Brian McDermott,
With regards to our discussion just now, employees responding to the emergency in Japan and staffing the NRC Emergency Operations Center 24/7 should be provided an opportunity to elect an Expanded-Compressed Work Schedule IAW CBA, Article 6.10.3 and Yellow Announcement 2003-032 dated May 7, 2003 (below and attached). This schedule was developed to be appropriate for emergency response work to provide flexibilities for both accomplishing the agency mission and ensuring employees can basically work a first 80 schedule with less complicated applications for overtime that many higher graded responding employees may find limited.

Employees will also appreciate the lifting of the bi-weekly pay cap to an annual pay cap to permit higher graded employees to be paid for overtime while responding to this situation in Japan.
---Dale Yeilding

National Treasury Employees Union

Dale Yeilding
NTEU Chapter President

Phone (301) 415-3600
E-mail NTEU@nrc.gov
Office OWFN O1G22

NTEU Working Today
For a Better Tomorrow

W/194

Greenwood, Carol

From: Gibson, Kathy
Sent: Friday, March 18, 2011 1:30 PM
To: 'rogaunt@sandia.gov'; Uhle, Jennifer
Cc: 'sypicke@sandia.gov'; Santiago, Patricia
Subject: Re: Perspectives in Reactor Safety Course Next Week

Randy,
Our Office of Human Resources has the contract with you, not RES. I have already gave them a heads up about this issue. You will have to talk to them about cancelling the course or providing alternate instructors. It is not our contract. Pat talked to OHR and they indicated that they are not cancelling the course.

We share your concern.

Kathy

From: Gauntt, Randall O <rogaunt@sandia.gov>
To: Uhle, Jennifer
Cc: Pickering, Susan Y <sypicke@sandia.gov>; Gibson, Kathy; Santiago, Patricia
Sent: Fri Mar 18 13:03:58 2011
Subject: Perspectives in Reactor Safety Course Next Week

Jennifer,
In anticipation of more Fukushima drama next week, please consider cancelling the training course next week – I know it's not your class, but I can anticipate Dana and I needing to be available for emergency consulting next week and this will be a disaster if we have walk out of class midway.

Randy

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release in entirety

Kock, Andrea

From: Franovich, Mike
Sent: Monday, April 18, 2011 3:21 PM
To: Ostendorff, William
Cc: Nieh, Ho; Kock, Andrea; Zorn, Jason
Subject: Japan One Pager 1500 EDT 4-18-11
Attachments: Japan One Pager 1500 EDT 4-18-11.pdf

Only change from a.m. version for 4-18-11. No details have been offered on the new "composite" assessment document.

"PMT, via the line organization continues to work on the final "Composite" document. Comments from Line Organization Staff due COB 4/18. Due to Chairman by Wed March 20."

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Refer to NSIR

April 18, 2011 1500 EDT

One-Pager - Fukushima Daiichi

ET Overview and Priorities

- ET turnover: WebEoc turnover list, one-pager, list of major documents, tasker list, ET Log Book.
- Plant and fuel pool conditions are generally unchanged.
- Headquarters Operations Center transition activities continue. Documented the process for tasking actions to Line Organizations. See Ops Center Transition Plan Document (WebEOC).
- Sen. Mikulski visited NRC Monday, April 18. Met with Chairman, then senior officials, then Ops Center for short tourUSAID will transition support for NRC Japan Site Team to NRC (OCFO/OIP) on May 1. USAID will continue to support until May 1.
- Slides on Interim Comprehensive Safety Assessment, TEPCO "Roadmap", and METI statement sent to Commission Assistants.
- Unit 3 using robot to ascertain radiation, temperature, and damage in plant.
- Fukushima-Daiichi site staffing currently sits at 778.

RST Overview and Priorities

- Continued monitoring of Units. Unit 3 drywell head temperature is trending down. Otherwise, no major change in status.
- NSIR reviewing the "composite" document, *Guidance for the Re-Entry and Return of US Citizens to Areas Around Fukushima Daiichi NPP*. Comments from NRC offices being incorporated. After Chairman approval, provide to Federal family for review.
- "Interim Comprehensive Assessment" document lead is Tim Collins. RST feedback ongoing.
-
- Consortium provided Roadmap for comment.
- Robots being used to map radiation/oxygen levels in specific locations in all 3 units and taking video.

PMT Overview and Priorities

- Supporting request from Japan Team to provide assistance for determining intermediate phase ingestion pathway dose determination. (Task #4701, request sent to NRR POC). Japan Team also reaching back to DOE as PAG results is being reported in DOE SITREPs.
- PMT, via the line organization is supporting NARAC in updating source terms, and reviewing new source terms. No update over weekend, line organization to touch base with NARAC on Monday.
- PMT, via the line organization continues to work on the final "Composite" document. Comments from Line Organization Staff due COB 4/18. Due to Chairman by Wed March 20.
- Japan Team is actively tracking radiation readings and also refining source terms. Sandia reps are slated to leave Japan on Wed, April 20.

LT Overview and Priorities

- Mark Schaffer (at IAEA) has requested permission to share the NRC SitRep with the Chinese government, OIP is working). OIP was advised this document should not be shared.
- Congressman Markey's office: One outstanding question "was there a pressure vessel rupture on Unit 2"? RST provided GEH analysis to LT, and LT forwarded the analysis by email to OCA to follow-up with Congressman Markey's staff. ET requested advice from OCA on how to proceed.
- LT requested Steve Reynolds of the Japan Site Team to facilitate transferring the role for leading the Consortium calls to the Embassy.
- GEH analysis of Unit 2 core sent to technical consortium.

Beasley, Benjamin

From: Beasley, Benjamin
Sent: Friday, March 18, 2011 9:38 AM
To: Kauffman, John
Subject: RE: Response from "Contact a GIP Representative"

Thank you!

-----Original Message-----
From: Kauffman, John
Sent: Friday, March 18, 2011 9:09 AM
To: miller@decysive.com
Cc: Beasley, Benjamin
Subject: RE: Response from "Contact a GIP Representative"

Ronald,

The events in Japan resulting from the Tohoku earthquake are still ongoing. Unfortunately, until the event is reconstructed, we simply do not have the needed information to answer your question, i.e. detailed design information on their reactor buildings and spent fuel pools, the ground motion experienced at the site, or detailed reports of direct damage or effects on plant nuclear structures, systems, and components from the earthquake. Similarly, we do have reports from the operators on the amount of water that sloshed out of the pools.

There will undoubtedly be many lessons learned from the tragic events at Fukushima Daiichi, and NRC will be conducting a thorough review of our regulatory programs that ensure the safety of nuclear power plants.

John V. Kauffman
Senior Reactor Systems Engineer
US NRC/RES/DRA/OEGIB
Washington, DC 20555 Mail Stop: C-2A07M
Phone: 301-251-7465
Fax: 301-251-7410

-----Original Message-----
From: GIP Resource [mailto:GIP.Resource@nrc.gov]
Sent: Thursday, March 17, 2011 4:00 PM
To: Kauffman, John; Reisifard, Mehdi; Lane, John; Perkins, Richard; Killian, Lauren; Beasley, Benjamin; Smith, April; Bensi, Michelle; Ibarra, Jose
Subject: FW: Response from "Contact a GIP Representative"

From: miller@decysive.com[SMTP:MILLER@DECYSIVE.COM]
Sent: Thursday, March 17, 2011 4:00:18 PM
To: GIP Resource
Subject: Response from "Contact a GIP Representative"
Auto forwarded by a Rule

W/197

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

(miller@decysive.com) on Thursday, March 17, 2011 at 16:00:17

---

comments: W.R.T. the situation in Japan at Fukushima Daiichi etc., what fraction of the water volume could be expected to have been sloshed out of the spent fuel pools during the 9.0 earthquake oscillations, leaving the remaining water fraction (without replenishment) to evaporate/boil at a faster rate, leading to uncovered fuel rods, hydrogen production, fires, etc.?

name: Ronald L. Miller

organization: Decysive Systems

address1: 813 Calle David

address2:

city: Santa Fe

state: NM

zip: 87506

country: USA

phone: 505.988.7502

Beasley, Benjam

From: Beasley, Benjamin
Sent: Friday, March 18, 2011 7:03 AM
To: Kauffman, John
Subject: FW: Response from "Contact a GIP Representative"

John,

Please forward this to the appropriate party (Ops Center or OPA).

Ben

-----Original Message-----
From: GIP Resource [mailto:GIP.Resource@nrc.gov]
Sent: Thursday, March 17, 2011 4:00 PM
To: Kauffman, John; Reisifard, Mehdi; Lane, John; Perkins, Richard; Killian, Lauren; Beasley, Benjamin; Smith, April; Bensi, Michelle; Ibarra, Jose
Subject: FW: Response from "Contact a GIP Representative"

From: miller@decysive.com[SMTP:MILLER@DECYSIVE.COM]
Sent: Thursday, March 17, 2011 4:00:18 PM
To: GIP Resource
Subject: Response from "Contact a GIP Representative"
Auto forwarded by a Rule

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

(miller@decysive.com) on Thursday, March 17, 2011 at 16:00:17
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comments: W.R.T. the situation in Japan at Fukushima Daiichi etc., what fraction of the water volume could be expected to have been sloshed out of the spent fuel pools during the 9.0 earthquake oscillations, leaving the remaining water fraction (without replenishment) to evaporate/boil at a faster rate, leading to uncovered fuel rods, hydrogen production, fires, etc.?

name: Ronald L. Miller

organization: Decysive Systems

address1: 813 Calle David

address2:

city: Santa Fe

state: NM

zip: 87506

country: USA

W/198

phone: 505.988.7502

Kock, Andrea

From:	Franovich, Mike
Sent:	Sunday, April 17, 2011 2:47 AM
To:	Ostendorff, William
Cc:	Nieh, Ho; Kock, Andrea; Zorn, Jason
Subject:	FW: Final Slides - NRC INTERIM COMPREHENSIVE ASSESSMENT OF FUKUSHIMA EVENT
Attachments:	JapenGlobalAssessmentFinalApril15.pptx

The latest set of slides for Sec Clinton, et al. There appears to be one minor change from the previous set of slides in that the core damage estimates being used appear to be the TEPCO provided estimated of 70, 30, 25 percent for units 1, 2, 3 respectively. Hopefully the IAEA package is also used to supplement as it provides more comprehensive information than these slides convey.

From: Casto, Chuck
Sent: Saturday, April 16, 2011 10:57 PM
To: ET07 Hoc; HOO Hoc
Cc: Moore, Scott; Zimmerman, Roy; Virgilio, Martin; Reynolds, Steven
Subject: *Final slides for the ET - please pass along*

Attached are the final slides I sent to the Ambassador's secretary. They will have them for the on-site briefing package. If SoS wants a few minutes we will give quick verbal. Otherwise Ast. Sec. Donohue (DOE) is traveling with her and will have these details. We've briefed him and his staff previously so he is up to speed. It is expected that she will at least say something to the NRC folks.....The ambassador recommended to her that she discuss the NRC.

Thanks
chuck

W/199

Beasley, Benjamin

From: Beasley, Benjamin
Sent: Friday, March 18, 2011 7:50 AM
To: Stutzke, Martin
Subject: FW: RES support for commission meeting on Monday 3/21.

Marty,

I know you are occupied. This is what I called about Thursday. George Wilson is handling the Commission briefing for Pat. Kamal is at his son's wedding in California. George called me to ask that you be in his pit crew at the briefing to answer questions that may arise regarding GI-199.

Ben

From: Coyne, Kevin
Sent: Thursday, March 17, 2011 2:10 PM
To: Beasley, Benjamin
Subject: RE: RES support for commission meeting on Monday 3/21.

Ben –

Are you, John, and/or Marty able to support the Commission meeting?

From: Beasley, Benjamin
Sent: Thursday, March 17, 2011 11:14 AM
To: Wilson, George
Cc: Kauffman, John; Killian, Lauren; Manoly, Kamal; Coyne, Kevin; Stutzke, Martin
Subject: FW: RES support for commission meeting on Monday 3/21.

George,

As I mentioned on the phone call, we took the liberty of drafting a key message for the GI-199 Comm Plan. It is provided in John's message below.

I will talk to Kevin Coyne (acting director) and Marty about support for the Commission briefing. Let us know if you need anything else for the briefing or the Comm Plan.

Ben

From: Kauffman, John
Sent: Thursday, March 17, 2011 10:15 AM
To: Beasley, Benjamin
Subject: RE: RES support for commission meeting on Monday 3/21.

Ben,

For GI-199 and the Fukushima Daiichi earthquake and tsunami a key message could be (this is from Annie's document (answers 3 and 22 combined)),

> US plants are designed for appropriate earthquake shaking levels and are safe. Currently the NRC is conducting a program called Generic Issue 199, which is reviewing the adequacy of the earthquake design of US NPPs in central and eastern North America based on the latest data and analysis techniques. The NRC will look closely at all aspects of the response of the plants in Japan to the

W/200

- earthquake and tsunami to determine if any actions need to be taken in US plants and if any changes are necessary to NRC regulations.

Key messages from the GI-199 Communications Plan (slightly tweaked) are:

(1) In August 2010, the Safety/Risk Assessment for GI-199 was completed. That assessment found that operating nuclear power plants are safe: Plants have adequate safety margin for seismic issues. The NRC's Safety/Risk Assessment confirmed that overall seismic risk estimates remain small and that adequate protection is maintained.

(2) Though still small, some seismic hazard estimates have increased: Updates to seismic data and models indicate increased seismic hazard estimates for some operating nuclear power plant sites in the Central and Eastern United States.

(3) Assessment of GI-199 will continue: Plants are safe (see key message 1), but the NRC has separate criteria for evaluating whether plant improvements may be imposed. The NRC's Safety/Risk Assessment used readily available information and found that for about one-quarter of the currently operating plants, the estimated core damage frequency change is large enough to warrant further attention. Action may include obtaining additional, updated information and developing methods to determine if plant improvements to reduce seismic risk are warranted.