

(2,042 Pages)

Group CZ

(Records Withheld
In Part)

From: LIA07 Hoc
Sent: Thursday, March 17, 2011 12:21 PM
To: LIA01 Hoc; LIA11 Hoc
Subject: FW: RFI Support
Attachments: FCM Tracking Sheet_17 March 2011.xlsx

Categories: FOIA

And another...

-Jim

From: Skypek, Thomas M [mailto:SkypekTM@state.gov]
Sent: Thursday, March 17, 2011 12:03 PM
To: LIA07 Hoc
Subject: FW: RFI Support

This email is UNCLASSIFIED.

From: Skypek, Thomas M
Sent: Thursday, March 17, 2011 12:01 PM
To: 'nitops@nnsa.doe.gov'
Subject: RFI Support

Deputy Secretary Steinberg/Assistant Secretary Campbell are looking for an idea of where USG stands in respond to the FCM request. Need support populating NRC pieces of this.

Tom

Tom Skypek
U.S. Department of State
ISN/WMDT FCM Program
Office: (703) 875-4915
skypektm@state.gov

This email is UNCLASSIFIED.

FCM Request Tracking Matrix

| Capability/Items Requested by GOJ | | DOD | DOE | HHS |
|-----------------------------------|---|--------|-----|-----|
| <u>Urgent Issue</u> | Water and Boron spraying to Spent Fuel Pond | | | |
| | Discharge of water to Spent Fuel Pond from the pump on the ground | | | |
| | Transportation of large volume pumps from Onagawa to Fukushima-Daiichi NPS (about same volume as five trailers) | (b)(5) | | |
| | Large amount of pure water (e.g. Water in the barge carrier) | | | |
| <u>Preparation Work</u> | Removal of scrap and waste in the high radiation area (e.g. by robot) | | | |
| | Remote control camera with ability of capture image in the demolition debris | | | |
| | Remote control camera with ability of capture image in the high radiation area (e.g. by radio control helicopter with camera) | | | |
| <u>Recovery Work</u> | Temporary house unit for changing radiation protection clothing, radiation survey meter, and radiation protection worker | | | |
| | Recover of damaged reactor building (support work) | | | |
| | Temporary shielding (e.g. shielding suit from radiation at work like heavy machine operation) | (b)(5) | | |
| | Gasoline, diesel oil | | | |
| | Pocket dosimeter | | | |
| | Protection clothing, Charcoal mask, radiation protection sox/shoes/glove | | | |

| | | | | |
|---------------------------------|---|--------|--|--|
| <u>Material & Equipment</u> | Generator | | | |
| | Battery | | | |
| | Pumps | (b)(5) | | |
| <u>Evacuation Support</u> | Transportation for people who want to evacuate out of 30 km radiation area (appx. 5500 persons) | | | |
| <u>Medical Issue</u> | Survey meter | | DOE-Health Physics Equipment (for contamination surveys) | |
| | Decontamination work | | 1 DTRA CMAT team on the ground (2 en route) - not yet performing decon but have capability 140 pax from CBIRF ready to deploy | |

| | | | | |
|-------------------------|--|--|--|--|
| <p><u>Radiation</u></p> | <p>Environmental monitor (Air, Sea, Ground)</p> | | <p>DOE Aerial Measuring System is deployed as well as 5 x2-man field monitoring teams DOE reports that they have had both fixed and rotary wing air monitoring assets (manned) in Japan performing assessments very near the site since yesterday. Data from those over flights will be available soon and an assessment can be done to determine if additional airborne monitoring capability is required. DOE does not have drones. DOE will have an answer on the robots and unmanned equipment today. (e-mail David Kenagy, ISN/NESS/Thursday, March 17, 2011 9:58 AM)</p> | |
| <p><u>Common</u></p> | <p>Transportation of tool, material and equipment mentioned above to the designated area</p> | | | |

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•Transported high pressure pumps from Fukuoka to Yokota

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|--|--|--|--|--|
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~~SENSITIVE BUT UNCLASSIFIED~~

'openings

IA to YOKOTA

~~SENSITIVE BUT UNCLASSIFIED~~

From: LIA07 Hoc
Sent: Thursday, March 17, 2011 12:19 PM
To: LIA01 Hoc; LIA11 Hoc
Subject: FW: Fwd: Army Assistance (UNCLASSIFIED)
Attachments: image001.jpg

Categories: FOIA

???

From: RMTFACTSU_ELNRC [mailto:RMTFACTSU_ELNRC@ofda.gov]
Sent: Thursday, March 17, 2011 11:50 AM
To: LIA07 Hoc
Subject: RE: Fwd: Army Assistance (UNCLASSIFIED)

Are we being asked to act on this? Does the NRC need or want this support?

From: LIA07 Hoc [mailto:LIA07.Hoc@nrc.gov]
Sent: Thursday, March 17, 2011 11:02 AM
To: RMTFACTSU_ELNRC
Cc: OST02 HOC
Subject: FW: Fwd: Army Assistance (UNCLASSIFIED)
Importance: High

FYI

From: OST02 HOC
Sent: Thursday, March 17, 2011 11:01 AM
To: LIA07 Hoc
Subject: FW: Fwd: Army Assistance (UNCLASSIFIED)
Importance: High

Jim, please forward to our US AID POC.

From: HOO Hoc
Sent: Thursday, March 17, 2011 10:10 AM
To: LIA07 Hoc; OST01 HOC; OST02 HOC; OST03 HOC
Subject: FW: Fwd: Army Assistance (UNCLASSIFIED)
Importance: High

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



From: Coggins, Angela
Sent: Thursday, March 17, 2011 10:01 AM
To: HOO Hoc
Subject: Fw: Fwd: Army Assistance (UNCLASSIFIED)
Importance: High

Forwarding this just in case it might be helpful. If you could pass this on to US AID, if that's appropriate, that would be great. (b)(6) - not a work contact)

Angela Coggins
Policy Director
Office of Chairman Gregory B Jaczko
US Nuclear Regulatory Commission
angela.coggins@nrc.gov/301-415-1828

From: Kelly Sajonia (b)(6)
To: Coggins, Angela
Sent: Thu Mar 17 09:06:28 2011
Subject: Fwd: Army Assistance (UNCLASSIFIED)

Angela,

Blake wanted me to forward this along to you. Feel free to contact Blake if you have questions.

Kelly Sajonia

(b)(6)

Begin forwarded message:

From: "Sajonia, Charles B CTR US USA" (b)(6)
Date: March 17, 2011 8:43:39 AM EDT
To: (b)(6)
Subject: Army Assistance (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Kelly,

As discussed, please pass this information to Angela. Dr. Alan Epstein (v-card attached) is part of an Army Medical R&D team that specializes in radiological defense matters, including the development of new protection and treatment technologies. Our Ft. Detrick office (USAMRMC) can facilitate an Interagency Agreement to make experts such as Dr. Epstein, as well as specialized equipment and materials, available to other agencies.

Blake Sajonia
Office of Research and Technology Applications, U.S. Army Medical Research and Materiel Command
(USAMRMC)
ATTN: MCMR-JA
504 Scott Street
Fort Detrick, Maryland 21702-5012
Office: 301-619-7130
Mobile: (b)(6)
(b)(6)

Classification: UNCLASSIFIED
Caveats: NONE

Attachment Dr. Alan Epstein.vcf(4874 bytes) cannot be converted to PDF format.

From: LIA11 Hoc
Sent: Thursday, March 17, 2011 10:25 AM
To: RMTFACTSU_ELNRC
Cc: (b)(6); Kozal, Jason
Subject: FW: HELP: Sen Roberts iodine for AMCITS

Guys is this something you can help with? There seems to be a import license issue for a US company sending KI to US citizens to Japan. Read the bottom to better understand the issue.

Beth

From: Harrington, Holly
Sent: Thursday, March 17, 2011 10:08 AM
To: RMTFACTSU_ELNRC; Burnell, Scott; McIntyre, David; PMT01 Hoc; Marshall, Jane
Cc: LIA11 Hoc
Subject: RE: HELP: Sen Roberts iodine for AMCITS

Believe this belongs with the federal liaison folks

From: RMTFACTSU_ELNRC [mailto:RMTFACTSU_ELNRC@ofda.gov]
Sent: Thursday, March 17, 2011 10:06 AM
To: Harrington, Holly; Burnell, Scott; McIntyre, David; PMT01 Hoc; Marshall, Jane
Subject: HELP: Sen Roberts iodine for AMCITS

Holly, PMT: Can you help with this?

From: Shane, Lynnea L [mailto:ShaneLL@state.gov]
Sent: Thursday, March 17, 2011 10:03 AM
To: RMT_PACTSU
Cc: Gatz, Karen L
Subject: Sen Roberts iodine for AMCITS

Hello OFDA colleagues

We are getting a few inquiries from congressional offices regarding requests to get various supplies to Japan. In this case there is a customs issue with the Japanese government to allow this brand of iodine pills into the country. Is this something that we should refer to you? Have you heard of a need for these pills in Japan? Should we refer them to a different office?

Thanks very much for your assistance.

Lynnea Shane
Director, Senate Liaison Office
Bureau of Legislative Affairs
U.S. Department of State
Russell Senate Office Building room 189
Tel. 202-228-1602

This email is UNCLASSIFIED.

From: Owens, Theda (Roberts) [mailto:Theda_Owens@roberts.senate.gov]
Sent: Thursday, March 17, 2011 7:54 AM
To: Shane, Lynnea L
Subject: RE: JAPAN EARTHQUAKE UPDATE 10 - March 16, 2011

Lynnea,

Thank you for taking my call yesterday. Due to the urgency of this request, I was hoping if there was any way to expedite via leg affairs, you might be able to help me do so. If that doesn't make a difference, I understand. But if you can push it faster in any way, that is much appreciated.

Thanks again. If you need anything at all from me, please do not hesitate to ask.
~Theda

Situation:

"We (Beckloff Associates) are a regulatory and scientific consulting firm in Overland Park, KS. We have a client, Fleming Pharmaceuticals, Fenton, MO, that produces a product called ThyroShield®, which is an oral solution of potassium iodide. This product is an FDA approved drug for the use of protecting an individual from harmful effects from uptake of radioactive iodine. As you can imagine, this drug is of very high value to people in Japan at this time and Fleming Pharmaceuticals has been inundated with interest in this product.

Some of the contacts they have received are from US-based companies that wish to purchase and send the product to their employees that live and work in Japan. The need to receive this medication is quite urgent under the current circumstances. However, this particular medication from Fleming is not approved in Japan. They need to make this shipment (and perhaps later additional shipments) as soon as possible – perhaps within 24 -48 hours.

The issue that we are facing is to get this through the Japanese Customs as well as, and in particular, the Japanese Ministry of Health, Labour and Welfare (MHW) agency when the shipment arrives and to get it quickly to the people that need it. We would like to point out that this will not be distributed to the general Japanese public but only to the employees and presumably their families of the US companies in Japan. Particularly, the shipment requires a Import License from the MHW.

We would be most appreciative if you could provide any assistance in obtaining an Import License from the MHW in an expedited fashion."

From: Shane, Lynnea L [mailto:ShaneLL@state.gov]
Sent: Wednesday, March 16, 2011 5:39 PM
To: Owens, Theda (Roberts)
Subject: FW: JAPAN EARTHQUAKE UPDATE 10 - March 16, 2011

Hi Ms Owens,

Below is our latest update on the situation in Japan that also includes our contact points including the dedicated email for congressional offices. JapanUSCcongressional@state.gov. You can forward the details of your case directly to that address.

Thanks
Lynnea

Lynnea Shane
Director, Senate Liaison Office

Bureau of Legislative Affairs
U.S. Department of State
Russell Senate Office Building room 189
Tel. 202-228-1602

This email is UNCLASSIFIED.

From: Penoyar, Sandra
Sent: Wednesday, March 16, 2011 1:33 PM
Subject: JAPAN EARTHQUAKE UPDATE 10 - March 16, 2011

In order to focus attention on congressional inquiries and provide you with prompt updates about constituents affected by the March 11 earthquake and tsunami in Japan, **we have created a dedicated email address:** JapanUSCcongressional@state.gov. If you have already been in contact with us via JapanEmergencyUSC@state.gov, there is no need to resend; we have your information on file. In addition, we will add your email address to the State Department Liaison Office's daily Japan updates. If anyone else on your staff would like to be added to the distribution list for this, please email: PenoyarS@state.gov.

We want to update you on the efforts of U.S. consular officers in the affected areas of Japan. There are currently four consular assistance teams in Miyagi and Ibaraki prefectures; they are using information from our inquiry database to seek out U.S. citizens we believe are in those areas, going door-to-door, talking with local security and healthcare officials, and visiting shelters and evacuation centers. To date, we have not received any reports of U.S. citizen deaths. The Sendai team is providing emergency consular assistance at the Sendai International Relations Association offices (SIRA) in Sendai, and there are also teams at the Narita and Haneda airports to assist U.S. citizens who are seeking to depart Japan.

Regarding the nuclear incidents in and around Fukushima, the Japan Nuclear Industrial Safety Agency (NISA) <http://www.nisa.meti.go.jp/english/> recommends that people who live within 20 kilometers of the Fukushima Nuclear Power Plant in Okumacho evacuate the area immediately, and that people in the zone between 20 and 30 km of the plant stay indoors at home or at work. The Japanese authorities have confirmed that the situation remains serious. The U.S. government and all experts are fully engaged in analyzing the issues, including those regarding Fukushima reactor, in close consultation with the Japanese Government.

We continue to send out updated messages through our Warden network in Japan; these messages, along with other useful information, can be viewed on our website: <http://travel.state.gov> under "Japan Earthquake and Pacific Tsunami." Additional information is available through the U.S. Embassy Tokyo website at: <http://japan.usembassy.gov/>. Japan situation and congressional contact information will be updated regularly on <http://travel.state.gov/congress/>.

How to help: We encourage cash donations. The web site www.interaction.org has a list of organizations accepting contributions. The American Red Cross is accepting donations of \$10 by texting REDCROSS to 90999.

USAID's Office of Foreign Disaster Assistance (OFDA) is coordinating the overall response management and humanitarian assistance effort. AID/OFDA can be reached at RMT_PACTSU@ofda.gov (underscore between RMT and PACTSU), Phone: 202 712 0039.

JAPAN EARTHQUAKE UPDATE 10

Japanese Police reported 3771 dead, 7843 missing, and 2044 injured. Embassy Tokyo has received no reports of U.S. citizen fatalities. Internally displaced persons number 530,000.

In a very rare televised address, the Japanese Emperor told citizens not to give up hope in the face of the earthquake and tsunami. He expressed deep concern about the nuclear situation.

Significant aftershocks continue, including a 6.0 magnitude event 60 miles offshore Tokyo at 2352 EDT March 15.

Most airports continue to operate, but ground transport is erratic due to gas and electricity shortages. Tokyo Metro asked commuters to avoid peak hours.

Currently, TEPCO can only supply 33 million kilowatts, leaving a shortfall of 4 million kilowatts. Several hundred thousand phone and internet connections remain disconnected.

Damage from the earthquake is expected to exceed the \$119 billion damage from the 1995 Kobe earthquake.

FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANT STATUS

A fire at reactor No. 4 led TEPCO to pull workers temporarily from the site, according to press. NRC is working to confirm the status of the fire and cooling water.

Forecasts for March 16 show winds blowing seaward.

Smoke began rising from reactor No. 3. Japanese Chief Cabinet Secretary Edano said the reactor's containment vessel might have been damaged.

Japanese Defense Minister Kitazawa said Self Defense Forces might be deployed to the Fukushima plant. Media report SDF helicopters have aborted water drops over reactor No. 3 due to safety concerns.

Minister Kitazawa said U.S. Forces Japan fire trucks delivered March 14 will be used to pump water to cool reactors No. 3 and No. 4. Trained TEPCO operators are now en route to the site.

Media report failure of containment at reactors No. 2 and 3. NRC is unable to confirm the levels of damage and radiation. Information flow and data gathering remain problematic.

U.S. AND INTERNATIONAL RESPONSE

Japan requested foreign consequence management support, transport of pumps, boron, fresh water, remote cameras, global hawk surveillance, evacuation support, medical support, decontamination, and radiation monitoring. U.S. Forces Japan is evaluating the request.

In a press conference, Ambassador Roos said the U.S. government and people were "stepping up in countless ways for the Japanese people." Recognizing conflicting reports, Amb. Roos committed to providing as much up-to-date information as possible.

U.S. Urban Search and Rescue (USAR) teams concluded their assignment in Iwate Prefecture without finding survivors. The teams will be reassigned to work with Chinese and UK USAR teams.

The Philippines and Malaysia announced they would monitor Japanese food imports for radiation.

To date, 102 countries and 14 international organizations have offered assistance.

CONSULAR ISSUES

Australia updated its travel advisory, noting the government had authorized the voluntary departure of dependants of Australian officials in Tokyo.

France advised its citizens to return home or relocate to the south of Japan. Air France planes are en route to Japan to assist in repatriation.

Austria is moving its embassy to Osaka due to radiation concerns.

The Chinese Embassy is sending buses to move its nationals from Miyagi, Fukushima, Ibaraki, and Iwate prefectures.

In addition to Ibaraki, Miyagi and Iwate prefectures, U.S. consular teams are in Tokyo area airports and Misawa Air Base.

Consulate General Hong Kong and AIT Taipei issued warden messages citing host government reports that there are no local threats from the nuclear situation in Japan.

This email is UNCLASSIFIED.

From: Marshall, Jane
Sent: Thursday, March 17, 2011 10:10 AM
To: 'RMTFACTSU_ELNRC@ofda.gov'
Subject: Re: HELP: Sen Roberts iodine for AMCITS

Why not send through State as a diplomatic shipment?
Sent from my NRC Blackberry

From: RMTFACTSU_ELNRC <RMTFACTSU_ELNRC@ofda.gov>
To: Harrington, Holly; Burnell, Scott; McIntyre, David; PMT01 Hoc; Marshall, Jane
Sent: Thu Mar 17 10:06:27 2011
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This email is UNCLASSIFIED.

From: LIA11 Hoc
Sent: Thursday, March 17, 2011 10:02 AM
To: LIA01 Hoc
Subject: FW: Military call

Categories: FOIA

FYI

From: RMTFACTSU_ELNRC [mailto:RMTFACTSU_ELNRC@ofda.gov]
Sent: Thursday, March 17, 2011 9:54 AM
To: LIA11 Hoc
Cc: Kozal, Jason
Subject: RE: Military call

Beth....talk to Bill Froh, the DOE rep sitting next to you and get a contact from Naval Reactors HQ have been working with.

(b)(5)

This is handled best by someone at HQ like a Trish Milligan or Cindy Jones.

From: LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]
Sent: Thursday, March 17, 2011 9:40 AM
To: RMTFACTSU_ELNRC
Cc: Kozal, Jason
Subject: FW: Military call

Jason can you help with answering this question? Thanks!

Beth

From: Harrington, Holly
Sent: Thursday, March 17, 2011 9:27 AM
To: LIA11 Hoc
Subject: FW: Military call

From: Royer, Deanna
Sent: Thursday, March 17, 2011 9:21 AM
To: Harrington, Holly
Subject: Military call

Inez Sookma
Defense Logistics Agency

(b)(6)

717-770-4244

Re: Who is responsible for decontaminating Yokosuka Base
She does have access to classified phone line if needed.

Deanna Royer
Contract Secretary
301-415-8200

From: RMPACTSU_ELNRC <RMPACTSU_ELNRC@ofda.gov>
Sent: Thursday, March 17, 2011 9:52 AM
To: LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc; LIA08 Hoc; Harrington, Holly; McIntyre, David; Burnell, Scott; Marshall, Jane; Gott, William; Grant, Jeffery
Subject: UPDATED: Japan EQ Press Guidance
Attachments: 110317 0930 EDT Japan EQ Press Guidance.doc
Categories: FOIA

Subject: UPDATED: Japan EQ Press Guidance

As of 0500 hours EDT on March 17, the Government of Japan (GoJ) National Police Agency reported 5,457 dead, 9,508 missing persons, and 2,409 injured people due to the earthquake and tsunami. In addition, the earthquake damaged or destroyed more than 86,000 buildings and 1,200 roads throughout northeastern Japan.

In addition, the earthquake damaged or destroyed more than 60,000 buildings and approximately 1,100 roads throughout northeastern Japan.

On March 16, the U.S. Embassy in Tokyo issued a statement, noting that the U.S. Nuclear Regulatory Commission (NRC), the U.S. Department of Energy (DoE), and other technical experts in the U.S. Government have reviewed the scientific and technical information in response to the deteriorating situation at the Fukushima nuclear power plant. The U.S. Embassy in Tokyo recommended, as a precaution, that American citizens who live within 50 miles (80 kilometers) of the plant evacuate the area or take shelter indoors if safe evacuation is not practical.

USG ASSISTANCE

The U.S. Agency for International Development is working with agencies across the U.S. Government—including the Departments of State, Defense, and Energy and the Nuclear Regulatory Commission—to assure that we are able to provide necessary assistance to the Government of Japan in the aftermath of the devastating earthquake and tsunami.

Within hours of the earthquake, USAID established a Response Management Team (RMT) in Washington, DC to help coordinate the U.S. response. The USAID Disaster Assistance Response Team (DART) is in Japan and working to manage the overall U.S. Government response effort in Japan in coordination with the U.S. Embassy in Tokyo.

Nuclear specialists on the DART—including 11 NRC officers, 1 DoE officer, and 1 U.S. Department of Health and Human Services (HHS) officer—are monitoring technical aspects of the nuclear issues at the Fukushima Daiichi nuclear power plant, engaging with GoJ officials on

the status of the health impacts of radiation, and providing guidance to the U.S. Embassy in Tokyo on efforts to cool reactors.

In response to the ongoing situation at the Fukushima nuclear plant, two DoD Humanitarian Assistance Survey Teams with chemical, biological, radiological, and nuclear expertise have positioned at Sendai and Yamagata cities, and a U.S. Northern Command contingent is traveling to Japan for crisis management planning.

At present, the DART comprises 167 people, including 144 U.S. urban search and rescue (USAR) personnel.

In coordination with the U.K., China and the National Japanese USAR teams, the U.S. USAR teams searched the central portion of the city of Ofunato on 3/15 (Tuesday) and Kamaishi City on 3/16 (Wednesday).

The two U.S. USAR teams, comprising 144 personnel and 12 live search canines, completed a technical search with canines and listening devices but did not detect any live victims in either location.

On March 17, U.S. and U.K. urban search and rescue teams conducted a joint mission in three previously unsearched sectors of Kamaishi City, Iwate Prefecture.

To date, the two U.S. USAR teams have completed all searches requested by the Osaka Fire Department, coordinator of USAR efforts in Ofunato and Kamaishi cities, with no live rescues.

International USAR teams are expected to finish rescue operations in the coming days as priority shifts to relief and recovery.

Due to the weather turning and the lack of survivable voids in the teams' assigned locations, the likelihood of finding survivors is very slim.

At the completion of today's search assignment, the U.S. teams will have made a thorough technical search of their assigned locations.

To date, the U.S. Department of Defense (DoD) has conducted 113 helicopter and 125 aircraft missions to support survivor recovery efforts, transportation of personnel, and distribution of more than 129,000 pounds of water and 4,200 pounds of food assistance. In addition, the III Marine Expeditionary Force has facilitated re-opening of an airfield in Sendai. DoD continues to support search and rescue operations at sea via use of aerial and surface assets.

For individuals and businesses who wish to help those in Japan, we encourage making a cash donation to a reputable organization working in the affected area. Nothing will get there faster or help more at this time. (visit www.usaid.gov for more info)

ONLY IF ASKED:

International USAR teams are expected to finish rescue operations in the coming days as priority shifts to relief and recovery. The U.S. USAR teams do not anticipate receiving any onward search and rescue assignments from the Government of Japan.

USG Press Guidance

Humanitarian Response to Japan Quake

Updated 3/17/2011 @ 0930 EDT

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From: LIA01 Hoc
Sent: Thursday, March 17, 2011 9:29 AM
To: LIA11 Hoc
Subject: http://en.wikipedia.org/wiki/United_States_Forces_Japan

Categories: FOIA

From: Kozal, Jason
Sent: Thursday, March 17, 2011 9:16 AM
To: LIA11 Hoc
Subject: Re: Chron Log

Thanks. It is helpful.

Sent from an NRC BlackBerry
Jason W Kozal

(b)(6)

From: LIA11 Hoc
To: RMTFACTSU_ELNRC <RMTFACTSU_ELNRC@ofda.gov>
Cc: (b)(6); Kozal, Jason
Sent: Thu Mar 17 09:12:49 2011
Subject: Chron Log

Along with the usual logs I have attached a log from PMT. Let me know if that is helpful and if you want me to continue sending the PMT log.

Beth

From: LIA01 Hoc
Sent: Thursday, March 17, 2011 8:35 AM
To: LIA11 Hoc
Subject: RE:

Categories: FOIA

From: LIA11 Hoc
Sent: Thursday, March 17, 2011 7:10 AM
To: LIA01 Hoc
Subject:

Federal Liaison Contacts

Pentagon Crisis Action Team 703-693-8683

USS GEORGE WASHINGTON Supply 808-473-8000 x7338
Matthew Vanravenhorst

US Navy Yokosuka Logistics 011 31 46 8162390
LCDR Chansipaeng

Bechtel – Ned Merchant 713-235-2924

GE-Hitachi – Victor Abelairas 910-819-1125

DOS Task Force 202-647-6611

National Security Staff
COL Julie Bentz

(b)(6)

Naval Reactors

Command Center 202-781-6399
Steve Trautman 202-781-6136

Defense Intelligence Agency 434-995-3623

Karyn Keller
Nicole Appleman
Steve Rue
Robert Roesler

From: LIA11 Hoc
Sent: Thursday, March 17, 2011 7:15 AM
To: PMT01 Hoc; PMT02 Hoc
Subject: FW: Scan Request
Attachments: RAD Levels.pdf

Categories: FOIA

FYI

I'm not sure what this is for or who requested it, but it came to the Fed Liaison desk and it looks like something the PMT might be interested in having.

Beth Reed
301-816-5208

From: OST02 HOC
Sent: Thursday, March 17, 2011 7:01 AM
To: LIA11 Hoc
Subject: Scan Request

From: LIA01 Hoc
Sent: Thursday, March 17, 2011 7:11 AM
To: LIA11 Hoc
Subject: FW: Press Releases: Special Press Briefing: Japan Situation Update

Categories: FOIA

From: U.S. Department of State [mailto:usstatebpa@subscriptions.fcg.gov]
Sent: Thursday, March 17, 2011 2:39 AM
To: LIA01 Hoc
Subject: Press Releases: Special Press Briefing: Japan Situation Update

Press Releases: Special Press Briefing: Japan Situation Update
Thu, 17 Mar 2011 01:29:01 -0500

Special Press Briefing: Under Secretary Pat Kennedy and Deputy Energy Secretary Dan Poneman on the Situation in Japan

Special Briefing
Patrick F. Kennedy
Under Secretary for Management
U.S. Department of Energy Secretary Dan Poneman
Via Teleconference
Washington, DC
March 16, 2011

[Listen to the audio.](#)

OPERATOR: Welcome and thank you for standing by. At this time, all participants will be in a listen-only mode. During the question-and-answer session, you may press *1 on your touchtone phone. Today's conference is being recorded. If you have any objections, you may disconnect at this time.

And now I'll turn it over to your host, the Acting Assistant Secretary of Public Affairs Mike Hammer. Thank you. You may begin.

MR. HAMMER: Thank you very much, everybody, for joining us this evening. You will have Under Secretary for Management at the State Department Pat Kennedy and Deputy Secretary of Energy Dan Poneman briefing you in a few moments. They will – Mr. Kennedy will do an opening statement, and then we'll have time for a few questions.

With that, let me just turn it over to Pat.

UNDER SECRETARY KENNEDY: Good evening. As a result of the tragic earthquake and tsunami that struck northeastern Japan on March 11th, the nuclear reactors at the Fukushima Daiichi plant were badly damaged and have experienced a series of failures that pose a serious hazard in the vicinity of the plant and a potential health hazard to a broader region.

The United States continues to support the strenuous and heroic effort by Japanese responders to address this nuclear emergency and is making available all relevant expertise, assets, equipment, and technology at our disposal. Our commitment to our Japanese ally is unshakable, and as President Obama said, we stand by the Japanese people in this time of trial.

Despite the best efforts of responders, the situation remains very serious. Given the situation, we recommended the evacuation of American citizens to at least 50 miles, in keeping with the guidelines applied in the United States. Since the continued or increased release of windborne radioactive material cannot be ruled out, American citizens in Japan are advised to take prudent precautions against potentially dangerous exposure. As a general matter, residents in areas further from Fukushima Prefecture face less risk of significant exposure, but changing weather conditions and wind direction means that radiation levels in the future might become elevated.

The Department of State urges American residents in Japan to take prudent precautions against the risk of sustained exposure, including relocating for potentially affected areas in northeastern Japan. The Department of State has authorized the voluntary departure, including relocation to safe areas within Japan, for family members and dependents of U.S. Government officials who wish to leave northeast Japan. The U.S. Government is also working to facilitate the departure of private American citizens from the affected areas – that is a 50-mile radius of the reactor – and a Travel Warning containing detailed information has been issued at www.travel.state.gov.

All Embassy, consulate, and other U.S. Government operations continue and are unaffected by this action. The Department of Defense has confirmed that U.S. military services and operations also continue without interruption. U.S. disaster relief and humanitarian assistance teams continue to assist the Japanese authorities throughout the area affected by the earthquake and tsunami.

American citizens are encouraged to carefully monitor the www.travel.state.gov website and the associated guidance that it provides.

Thank you.

MR. HAMMER: And with that, Operator, if we could please turn it over to questions.

OPERATOR: Thank you. If you would like to ask a question, you may press *1 on your touchtone phone. Please be sure to un-mute your phone and record your name slowly and clearly so I may announce you for your question. Again, at this time, if you would like to ask a question, please press *1.

Okay, our first question comes from Lalit Jha. Your line is open.

QUESTION: Thank you for taking this call. Can you give us a sense of how serious the situation is of these three plants there, and are you talking with any other country or IAEA or European countries in this regard taking any collective action to prevent any further damage to – damages to it? Thank you.

DEPUTY SECRETARY PONEMAN: I can comment on that. This is Poneman. We are watching the situation of the plants continuously. We're trying to get some ground data on what the actual condition is. As I think you know, Secretary Chu made available the detectors that will pick up possible contamination on the ground. We sent those over. They're flying around now. And we hope to have data from that.

We've heard a lot of conflicting reports. Obviously, there are elevated levels of radiation at the reactors. We are in consultation, comparing notes. IAEA is sending out regular reports. We're reading them carefully. And many colleagues professionally have been consulting with each other as well.

MR. HAMMER: All right, thank you very much. Operator, if we could go the next question.

OPERATOR: Next goes to Mary Beth Sheridan. Your line is open.

QUESTION: Hi, thanks for doing this. Pat, I just wondered if you could talk a little more about your comment that State has authorized the voluntary departure of family members and dependents of diplomats who wish to leave the northeast. What would that include? Is that Tokyo or – forgive my ignorance, but, like, which diplomats are we talking about there?

UNDER SECRETARY KENNEDY: What we're talking about is the – is what we call voluntary authorized departure for the family members at the American Embassy in Tokyo, the U.S. Consulate in Nagoya, which is west of Tokyo, and the State Department's Foreign Service Institute, which has a Japanese language training school in Yokohama. It is just those three, those three, not Osaka, not Sapporo in the north.

QUESTION: And excuse me, how many people roughly might that involve?

UNDER SECRETARY KENNEDY: Well, there are up to about 600 or so American family members who are dependents at those three institutions. So we're on school vacation now, so some people are just on vacation anyway. But let me just emphasize this is voluntary authorized. We have not ordered them to leave. This is – we have made this opportunity available to them should they choose to exercise it.

MR. HAMMER: All right, thank you very much. Operator, if we could go to the next question.

OPERATOR: Next question, Courtney Kube. Your line is open.

QUESTION: Hi, still on the authorized departure, so does that mean that the government will pay for the flights to take these people out? And then will they be flying – I assume they'll be flying on charters out of Tokyo, and what kind of safe havens will they be going to? Can you talk a little bit more about the logistics of that?

UNDER SECRETARY KENNEDY: Sure. Yes, I mean, when we do a voluntary authorized departure, the State Department bears the expense of the transportation. There are still commercial seats available out of Tokyo. However, because we do not wish to consume large numbers of seats that others might need, we are making arrangements to bring a couple of chartered aircraft into Tokyo for both the official U.S. Government family members who have chosen to leave and for any American citizens who might need assistance. We have teams of consular officers at both Haneda and Narita airports, and they will be looking and going – literally going through the terminal looking for American citizens who might be at the airport and who have been unable to make a reservation on a commercial flight that is outbound. And so we will – we were going to – we will assist those people, and if they need transport, we will put them on those – any of our chartered aircraft because we make those seats available equally to American citizens and U.S. Government officials. And we're still making the arrangements for where those aircraft will go, but they will probably be going to other major airports in the region therefore, and people are welcome – the private citizens are welcome to stay there or they may then continue on commercially. And while they're doing this, the American Embassy, which continues in full operation, will assist other American citizens with their questions.

MR. HAMMER: Thank you very much. Courtney, do you have a follow-up?

QUESTION: Yeah. Can I just – why is it that you are authorizing this departure for Embassy dependents but not warning other American citizens who are in the country who are in that particular part of the country to leave as well?

UNDER SECRETARY KENNEDY: No, we – as I mentioned in my opening statement, we have issued a Travel Warning. The Department of State warns U.S. citizens of the deteriorating situation. The State Department strongly urges U.S. citizens to defer travel and should consider departing. In other words, we have provided this information and we are saying to them this is information you've heard Deputy Secretary Poneman. They – but this is their choice. We are making information available to them and it is their choice, just as we're offering a choice to family members. This is not an ordered departure. We have not ordered individuals to leave and we are not closing down operations. The only order we have been given, so to speak, is we're saying that it really – if you're an American citizen and you're within that 50-mile radius, as the Embassy statement of this morning said, you should, you must, for your own safety, get out of the 50-mile zone.

MR. HAMMER: Thank you very much. Operator, if we could go to the next question.

OPERATOR: Next one, Viola Gienger. Your line is open.

QUESTION: Yes, thank you. I wanted to – what – did you have a lot of requests from personnel because they want – some of them wanted family members to leave? What was it specifically that prompted you to do this at this time?

UNDER SECRETARY KENNEDY: Well, the State Department's paramount obligation in our operations overseas is the safety and security of all U.S. citizens who live abroad. And we share with the Embassy and the Consulate this responsibility for the security of the official American community and of the private American community as well. And so by making this available, we are offering this opportunity for the family members to leave, and we are also notifying private American citizens, telling them that commercial space is available but also indicating that if they have difficulty leaving, we will attempt to assist them. And this also, while we're doing this, by saying to the U.S. Government employees if your family members happen to be concerned, this opportunity is available to them so we can get that 25th and 26th work hour out of the employees.

MR. HAMMER: Thank you very much. We have time for two more questions, Operator.

OPERATOR: Next one is Josh Gerstein. Your line is open.

QUESTION: Hi. Can you tell us how do you decide about what decisions to make vis-à-vis the Embassy personnel themselves? You just suggested that they're all working full-out at this moment. How do you judge what risk is appropriate for dependents and citizens and what is risk is appropriate for the actual U.S. Government officials, Foreign Service officers, and not to mention country nationals whose work – foreign country nationals whose work might put them at risk?

UNDER SECRETARY KENNEDY: Well, let me ask the Deputy Secretary to start on that question about the element of risk, and then I will close with our operating modus vivendi.

DEPUTY SECRETARY PONEMAN: Thanks, Under Secretary Kennedy. We are constantly monitoring the safety of our operations. And by the way, we do this on all of our energy sources. And it's a dynamic situation in which we are always seeking to increase margins of safety, how to do safety better. And just as the Under Secretary said, for State Department the safety of American citizens abroad is of paramount importance. We have exactly the same view: The safety of American citizens here at home is of paramount importance to us.

Now, that having been said, when it comes to making judgment calls of when a level of risk is excessive and when these kinds of warnings need to be laid down, of course, we have an independent regulatory authority, the Nuclear Regulatory Commission. That was split off in 1974 from the Atomic Energy Commission precisely to provide that kind of disinterested objective analysis of safety conditions. And as soon as they determine that a nuclear reactor is not safe to operate, they will immediately shut it down.

So while we are continuing our efforts to excel in improving safety performance because that's what our objective always is, we know that we have the independent authority of the Nuclear Regulatory Commission to ensure that plants are only operating when they're safe.

UNDER SECRETARY KENNEDY: Now, in terms of State Department operating procedures, the State Department operates on a principle, I guess you would call, of reasonable risk with mitigation. We look at a situation, we consult with officials such as Deputy Secretary Poneman and his colleagues, Secretary Chu, with the Nuclear Regulatory Commission. We get information from the Japanese officials. And as we would in any country, we make what we would like to think is an informed judgment about risk and necessity to advance U.S. national interest.

And in this case, we have not reached the point where we would say that we would go to the ordered departure of family members or ordered departure of U.S. Government employees. And so it's a complicated and complex analysis. It's a very fluid situation, as the Deputy said. But the State Department makes these decisions all the time all around the world, and sometimes decides the situation is good, sometimes decides the situation warrants essentially an escalating series of steps. And this is, in fact, the lowest step on our hierarchy.

MR. HAMMER: Thank you very much. Operator, one last question, please.

OPERATOR: Jennifer Griffin, your line is open.

QUESTION: Yes. How many planes do you expect to send, and are you planning to help the dependents of the Department of Defense or military families who are there? And also, what is the worst-case scenario that you're looking at in terms of your assessment of potential radiation? I mean, is there too much alarm out there in terms of your assessment right now, Mr. Poneman? Or are you concerned that the Japanese are under-reporting the radiation, and how serious could it be?

MR. PONEMAN: Well, some of your question I think relates to Under Secretary Kennedy in terms of the planes and so forth. On the second part, look, we are dealing with this situation on a day-to-day, indeed a minute-to-minute, indeed around-the-clock basis. We're monitoring the situation continuously. We have been talking continuously with our Japanese counterparts. They have made a number of – a lot of the information is available on their government websites or on TEPCO websites.

But it's a very fluid and indeed it's a very confused situation. There's lots of conflicting data. There's nothing we want more than to have accurate data. That's why, as I said a few minutes ago, we're flying those pods that we just sent over yesterday around to pick up better data on the ground and any radiation that might be coming from that.

And the other part of your question in terms of what's going to happen, again, all I can tell you is what we're doing, which is we're doing everything in our power to support the Japanese and their efforts to get water to those reactors, to get water to the spent fuel ponds, and get those fuel elements cooled down. The more success we have at that, the lower the long-term effect is going to be.

UNDER SECRETARY KENNEDY: On your other two questions, U.S. forces remain in Japan and the U.S. has the full capability to fulfill our alliance commitments. At the same time, the Department of Defense is going to implement the State Department-approved voluntary departure for eligible Department of Defense dependents stationed in Japan. And as with State Department dependents, this measure is obviously temporary and with the dependents going back.

We have a lash-up between the State Department's Logistics Office and TRANSCOM. We have DOD personnel who are sitting in our operations center. We are in constant contact with them. We work together, and if we need additional airlift resources, we will turn to them. To the extent that we have excess charter capacity that private American citizens are not utilizing, we will offer that space to DOD dependents who wish to leave. This is a total and complete, in effect, integrated operation with the ambassador and the commander of U.S. Forces in Japan all the way down in the same parallel positive lash-up in Washington.

MR. HAMMER: Thank you very much for joining us this evening. Of course, we will always be notifying the American public should there be any further announcements. Again, thank you for joining us, Deputy Secretary Poneman, Under Secretary Kennedy, and have a good evening.

OPERATOR: This concludes today's conference. We thank you for your participation. At this time, you may disconnect your lines.

PRN: 2011/405

[Back to Top](#)

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From: LIA03 Hoc
Sent: Thursday, March 17, 2011 5:32 AM
To: Shaffer, Mark R; LIA11 Hoc
Cc: LIA02 Hoc
Subject: RE: URGENT Civilian Full Face Mask for TEPCO [SEC=UNCLASSIFIED]

Categories: FOIA

Mark,

Contrary to the below, USAID is not currently working any of our lists. Long story, but they (USAID) verified independently with the Japan embassy that the list of items were not really officially requested, and have provided Japan with what was requested (i.e. pumps). Our (NRC) team in Japan is currently meeting with TEPCO to determine what their specific needs are and will be appropriately vetting the requests from the Embassy (there is supposed to be a logistics support team there). Will let you know when we have more.

Thanks,
Brian

From: LIA03 Hoc
Sent: Thursday, March 17, 2011 4:02 AM
To: 'Shaffer, Mark R'; LIA11 Hoc
Cc: LIA02 Hoc
Subject: RE: URGENT Civilian Full Face Mask for TEPCO [SEC=UNCLASSIFIED]

Mark,

“full face mask with charcoal filter type” is one of the items on the list USAID is working.

Scott,

Request we verify this is a high priority item at USAID.

Thanks
Brian

From: Shaffer, Mark R [mailto:ShafferMr@state.gov]
Sent: Thursday, March 17, 2011 3:53 AM
To: LIA02 Hoc; LIA03 Hoc
Subject: Fw: URGENT Civilian Full Face Mask for TEPCO [SEC=UNCLASSIFIED]
Importance: High

(b)(4)

From: HUTCHINGS, Ron <rhx@ansto.gov.au>
To: Shaffer, Mark R
Cc: GILCHRIST, Ryan <ryan.gilchrist@dfat.gov.au>; Ada.Cheung@dfat.gov.au <Ada.Cheung@dfat.gov.au>

Sent: Thu Mar 17 03:43:39 2011

Subject: FW: Re: URGENT Civilian Full Face Mask for TEPCO [SEC=UNCLASSIFIED]

Hi Mark,

(b)(4)

Best regards, Ron.

Dr Ron Hutchings
Head, International Relations
ANSTO, Locked Bag 2001, Kirrawee DC, NSW 2232, Australia
T: +612 9717 3733
F: +612 9543 1452
M:
E: ron.hutchings@ansto.gov.au

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From: STORR, Greg
Sent: Thursday, 17 March 2011 5:04 PM
To: GRIFFITHS, Hefin; COLELLA, Michael; HUTCHINGS, Ron
Subject: FW: Re: URGENT Civilian Full Face Mask for TEPCO [SEC=UNCLASSIFIED]

I have just noticed this email bounced from Ruben – a request for assistance from TEPCO. Can we respond? Is it protocol to do so?

Regards,

Greg

From: Ruben Mazzi [<mailto:mazzi@invap.ansto.gov.au>]
Sent: Thursday, 17 March 2011 10:44 AM
To: STORR, Greg
Subject: Fwd: Re: URGENT Civilian Full Face Mask for TEPCO

Dear Greg '

(b)(4)

Best regards

Ruben

From: fujimoto.yoichi <fujimoto@mus.co.jp>
To: Ruben Mazzi <mazzi@invap.com.ar>
CC: tsukui ken <tsukui@mus.co.jp>, ikeda.masayuki <ikeda@mus.co.jp>, nozawa.mayumi <nozawam@mus.co.jp>
Date: Thu, 17 Mar 2011 07:25:31 +0900
Subject: Re: URGENT Civilian Full Face Mask for TEPCO

Dear Ruben

(b)(4)

Fujimoto

On 2011/03/16, at 17:54, fujimoto.yoichi wrote:

Dear Ruben

Please refer to below mail.

(b)(4)

Fujimoto

(b)(4)

From: RMTPACTSU_ELNRC <RMTPACTSU_ELNRC@ofda.gov>
Sent: Thursday, March 17, 2011 5:07 AM
To: LIA11 Hoc
Subject: RE: IAEA Request for information

Categories: FOIA

No new status updates from us.

From: LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]
Sent: Thursday, March 17, 2011 3:44 AM
To: RMTPACTSU_ELNRC
Subject: FW: IAEA Request for information
Importance: High

Do you guys have any status on where this resides with DOS? Please let me know.

Thanks,
Scott

From: LIA03 Hoc
Sent: Thursday, March 17, 2011 3:35 AM
To: LIA11 Hoc
Subject: FW: IAEA Request for information
Importance: High

Request assistance to find status for Ambassador Davies as below.
Thanks
Brian Wittick

From: Shaffer, Mark R [mailto:ShafferMr@state.gov]
Sent: Thursday, March 17, 2011 3:13 AM
To: LIA02 Hoc; LIA03 Hoc
Cc: Schwartzman, Jennifer
Subject: FW: IAEA Request for information
Importance: High

(b)(4)

This email is UNCLASSIFIED.

From: IEC1@iaea.org [mailto:IEC1@iaea.org]
Sent: Wednesday, March 16, 2011 5:39 PM
To: ISN-NESS-OL@state.gov
Cc: Kenagy, W David; SES-O
Subject: Request for information

Dear Contact Point,

The Permanent Mission of Japan, through the IEC, is seeking information about the following capabilities in your countries:

1. Unmanned remotely controlled aerial vehicle for the aerial radiological survey
2. Robots for the work in the high dose rate areas
3. Unmanned remotely controlled ground vehicles for carrying equipment in the high dose rate areas

We would appreciate if you could provide the following information is required for three above mentioned categories:

- Technical details of the above mentioned equipment (including specifications)
- What is the possible availability of this equipment, and
- When it would be possible to dispatch this equipment, if requested

Looking forward receiving your reply,

Guenther Winkler
Emergency Response Manager
Incident and Emergency Centre, IAEA

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From: LIA11 Hoc
Sent: Thursday, March 17, 2011 4:32 AM
To: taskforce-1@state.gov
Subject: Response to Request for Guidance

Categories: FOIA

The NRC based its statements on Fukushima Daiichi Unit 4 based on the best information provided to NRC reactor experts in Japan.

Please do not hesitate to contact me if you have further questions or concerns.

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

From: RMPACTSU_ELNRC <RMPACTSU_ELNRC@ofda.gov>
Sent: Thursday, March 17, 2011 2:34 AM
To: LIA11 Hoc
Subject: RE: GoJ Request for Equipment

Categories: FOIA

Sorry, I meant the email that say no further action on this. It ended up being a miscommunication.

From: LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]
Sent: Thursday, March 17, 2011 2:33 AM
To: RMPACTSU_ELNRC
Subject: RE: GoJ Request for Equipment

I did. Forwarded it to RST and in-country team for action.

From: RMPACTSU_ELNRC [mailto:RMPACTSU_ELNRC@ofda.gov]
Sent: Thursday, March 17, 2011 2:33 AM
To: LIA11 Hoc
Subject: RE: GoJ Request for Equipment

You got my earlier email about this right?

From: LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]
Sent: Wednesday, March 16, 2011 10:10 PM
To: RMPACTSU_ELNRC
Subject: RE: GoJ Request for Equipment

This was the email I was talking about...sorry...30 minutes behind

From: RMPACTSU_ELNRC [mailto:RMPACTSU_ELNRC@ofda.gov]
Sent: Wednesday, March 16, 2011 8:16 PM
To: Morris, Scott; LIA11 Hoc; LIA01 Hoc; Gott, William
Subject: FW: GoJ Request for Equipment

Folks. If we can get specifics on the below items from the attached list we can continue to work through USAID to source and deliver. The list was very general, if we can get specifics we can get them sourced (procured). Hopefully USJF has this available in country for delivery.

Some items are already in process with specifics by different means, but more is better in this case. We may need to work with the folks in Japan to get specifics on some items.

Kathleen,

FROM LOGS:

In looking at the request list you sent me (attached), most of the items are specialized equipment like robots or major undertakings such as means of evacuation.

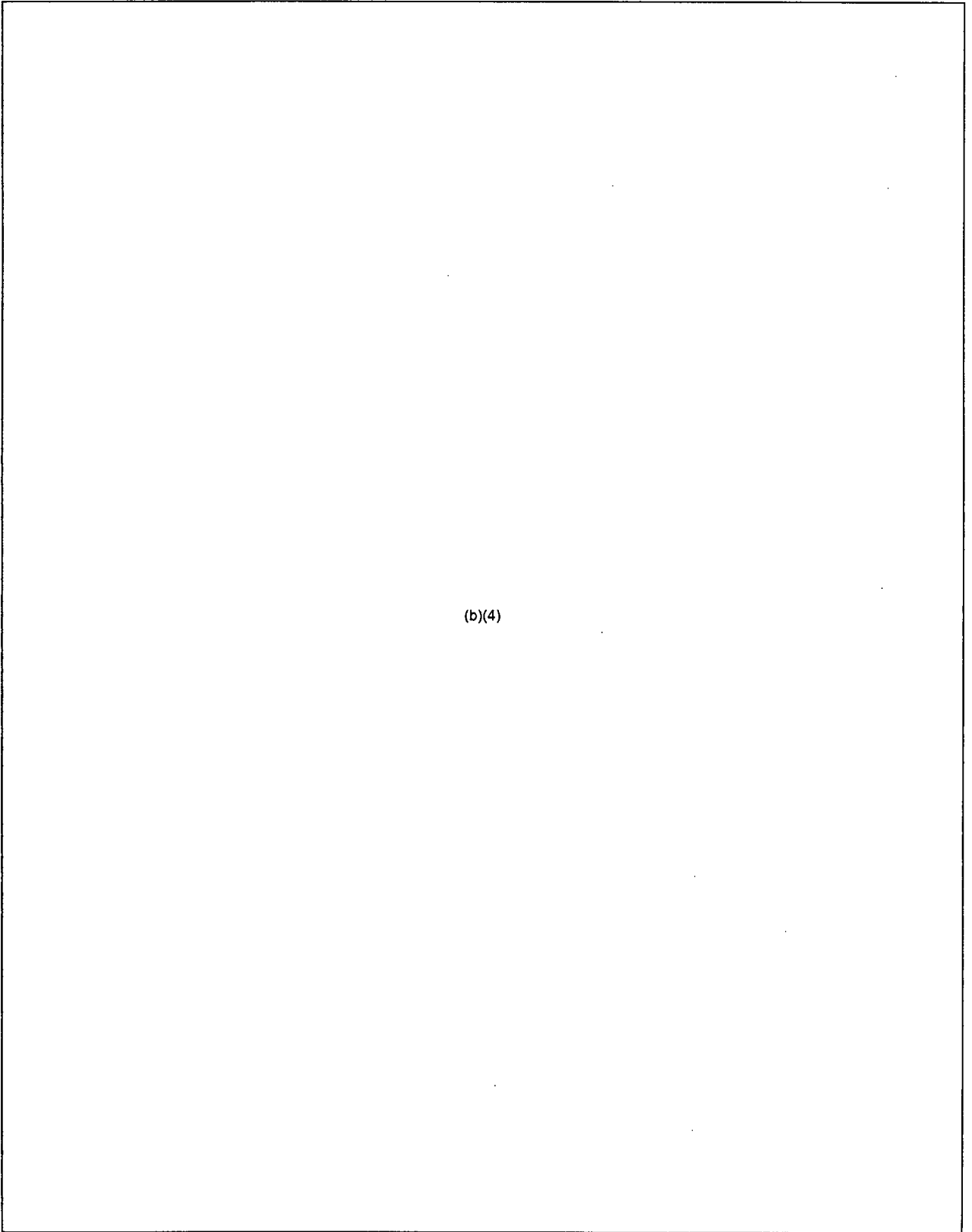
Per your direction, the following appear to be items that, with a bit more clarity we may be able to provide:

- Measuring instruments for radiation
- Protective clothing, charcoal masks, protective socks, shoes and gloves
- Generators
- Battery Chargers
- Pumps
- Meters for survey (Medical)

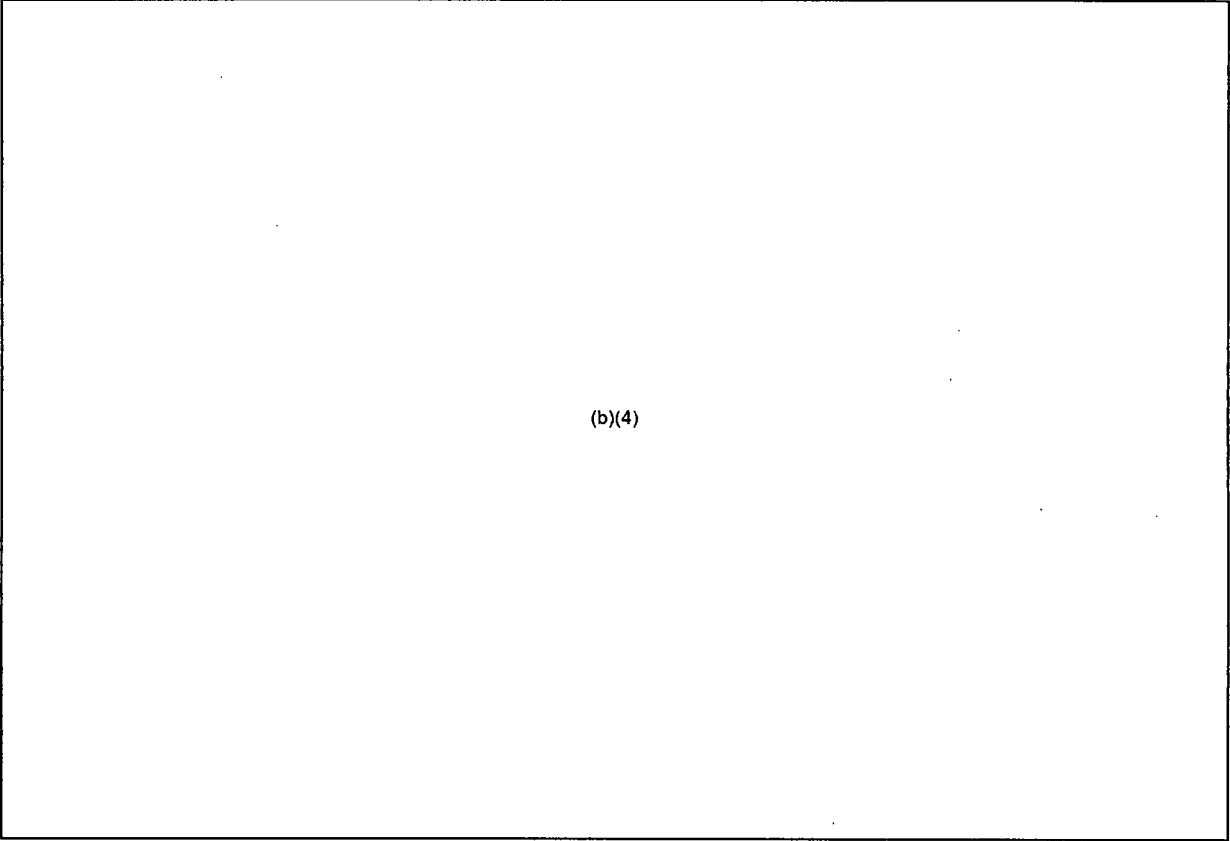
~Pat

Todd Horne / Pat Long / Rob Thibault
Logistics Coordinator
202-712-0039 x-5706

List of requests to the US Government



(b)(4)



From: LIA11 Hoc
Sent: Thursday, March 17, 2011 1:16 AM
To: Kolb, Timothy
Subject: Pumps On-Site

Importance: High

Categories: FOIA

Tim,

We have been tasked with working on a pumping system for the site, and we are looking for some pumps that NR delivered to Yokota. I am specifically looking for 2 submersible pumps and 2 booster pumps. Have you seen them? Are they being used? Should we look for other pumps to use in the system we're trying to put together?

Please give me a ring if you have any questions or concerns.

Thanks,
Scott Sloan
NRC Operations Center
(301) 816-5186

From: LIA11 Hoc
Sent: Thursday, March 17, 2011 1:08 AM
To: Devercelly, Richard
Subject: Can you call me at (301) 816-5186 ASAP?

Importance: High

Categories: FOIA

From: Merchant, Ned <cemercha@bechtel.com>
Sent: Thursday, March 17, 2011 12:42 AM
To: LIA11 Hoc
Cc: Thomas, Eugene
Subject: FW:
Attachments: Type File Name.pdf

Categories: FOIA

Scott,

Can you call into this number now?

Best Regards, Ned
"Quality is not an act, it is a habit"

-----Original Message-----

From: Thomas, Eugene
Sent: Wednesday, March 16, 2011 11:41 PM
To: Merchant, Ned
Subject: FW:

Attached is a very rough sketch of our intent. Could you and Scott call
866 232 8005 Conference code (b)(6)

Thanks,

Gene

-----Original Message-----

From: Thomas, Eugene
Sent: Thursday, March 17, 2011 12:38 AM
To: Thomas, Eugene
Subject:

From: LIA11 Hoc
Sent: Thursday, March 17, 2011 12:35 AM
To: ge.hitachinuclearresponseteam@ge.com
Cc: Merchant, Ned
Subject: Documents
Attachments: Pump Curves.pdf; Original Email List.pdf; USN Shipping Documents.pdf; Temp Spent Fuel Pumping System.pdf

Categories: FOIA

GE-Hitachi Team –

Please find attached the documents we discussed. Please let me know if you have any questions or concerns.

Thanks,
Scott Sloan
NRC Operations Center
(301) 816-5186

RE: Additional Equipment Needs for Fukushima

Duong, Tamanh Q LCDR USN USFJ J4 (b)(6) on behalf of USFJ-CAT-J4 (b)(6)
(b)(6)

Sent: Wednesday, March 16, 2011 12:29 PM

To: Williams, Joseph

Cc: (b)(6)

Mr. Williams

Copied. Any other technical details you can provide to the list below would be greatly appreciative. It would help to prime the TEPCO engineers and MOFA, in case they ask.

Thanks!

V/R

Tamanh

Tamanh Q. Duong, P.E., MBA
USFJ-CAT-J4 Watch Officer (0700-1900)
Operation Tomadachi
DSN: (315) 225-4110/4105, FAX: x6743
Commercial (CONUS) 011-81-3117-55-4110/4105
Commercial (JAPAN) 03117-55-4110/4105
NIPR: (b)(6)
SIPR: (b)(6)

-----Original Message-----

From: Williams, Joseph [mailto:Joseph.Williams@nrc.gov]
Sent: Thursday, March 17, 2011 1:15 AM
To: Duong, Tamanh Q LCDR USN USFJ J4
Cc: RST01 Hoc; Casto, Chuck; Monninger, John
Subject: Additional Equipment Needs for Fukushima
Importance: High

Attached is the sketch of the pump and piping configuration discussed with you in our conference call a short time ago.

The equipment needed is summarized as follows:

Requested 4 trains of mobile pumps including the following

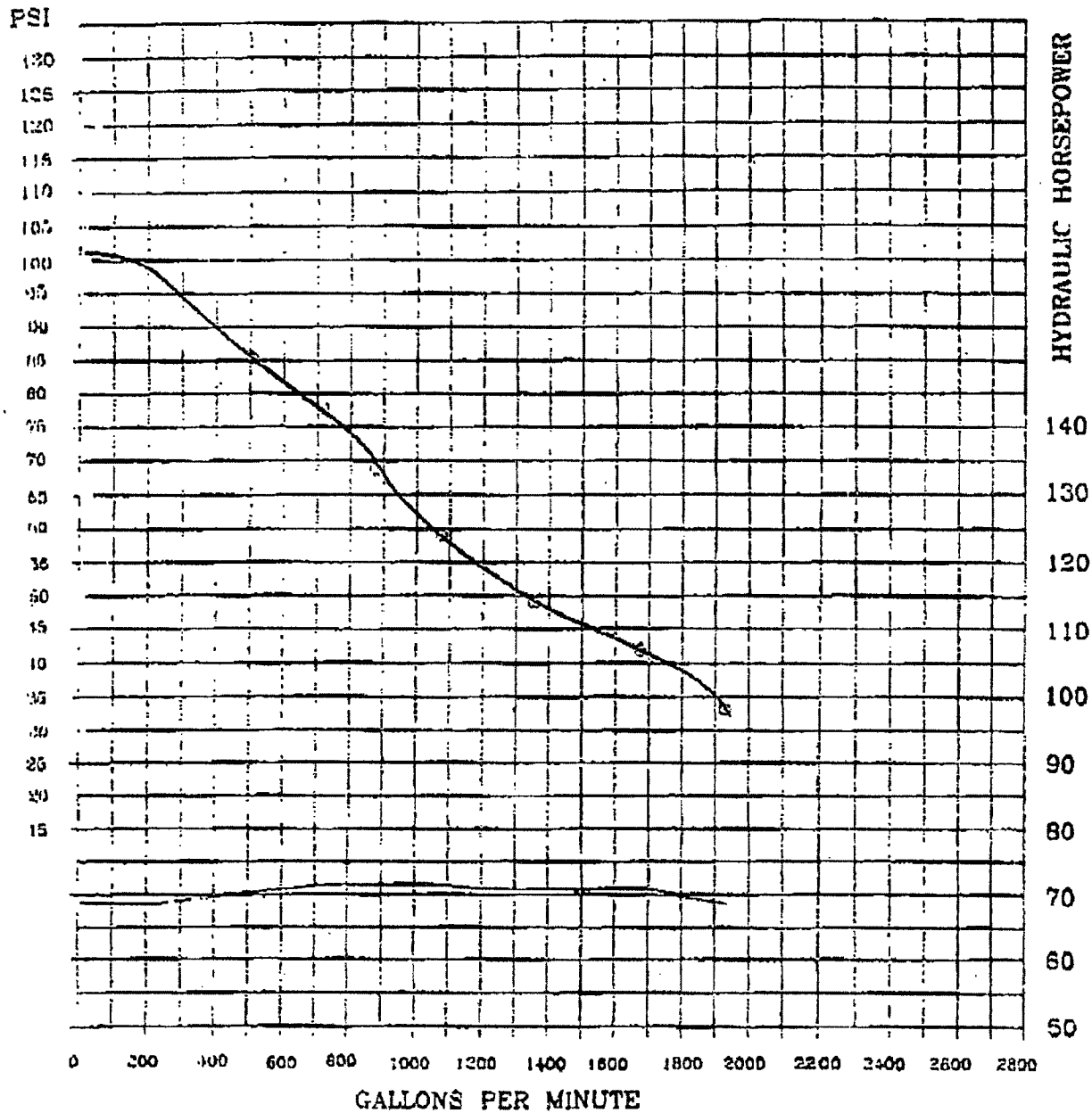
- 4 each Diesel Sea Water Suction pump with Strainer.
- 4 each Diesel Booster Pumps.
- 4 each Diesel Spray Pumps. 100m Length 50m High Provide approximately 500 gpm water flow to Fukushima Daiichi Spent Fuel Pools.
- Diesel Fuel tanks and Fuel to support pump trains.
- 500 meters of Piping for 2 trains.
- 700 meters of Piping for 2 trains.
- People to assist in assembly of trains
- 20,000 # or more Boron
- Back-up Systems including
- 4 Pumper Trucks
- Robots for High Rad work with camera capability.

Please contact the Reactor Safety Team by phone or at rst01.hoc@nrc.gov

Thuk
~~Model~~ EUREKA
~~Sub~~ pump 6'

LC 202-781-6430
RMC 518
ATTN - Gordon Szefta or
Lowell Steinhauff

COMPARISON CURVE: NAVOI DATE: 01/08/94
NAVY PUMP KVAERNER EUREKA CCN150-3C TESTED WITH NAVY 87 HP
MOD 6 HPU.



S0300-BV-CAT-010

PUMP, SUBMERSIBLE, 4" HYDRAULIC

ESSM NUMBER PU0208

DESCRIPTION

The 4-Inch Hydraulic Submersible Pump PU0208 is capable of pumping water containing solids up to 2 inches in diameter. The pump is rated for continuous output of up to 1100 gpm at 10-psi discharge pressure. Quick disconnect fittings are utilized to allow for rapid hookup of the discharge hose and the supply and return hydraulic hoses.

SPECIFICATIONS

Manufacturer Marco Inc.

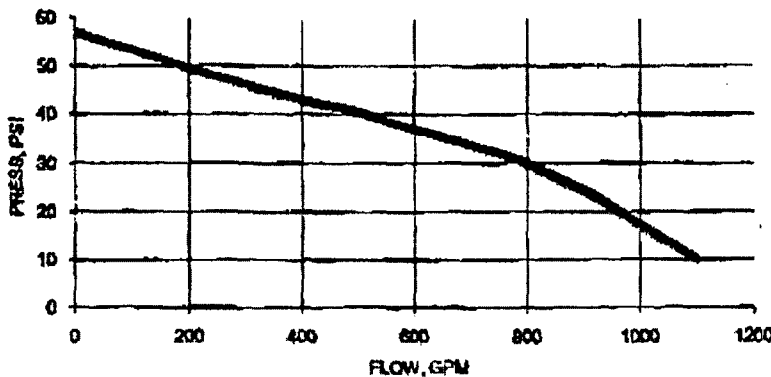
Pump

Manufacturer Marco Inc.
Model U102
Type Submersible
Discharge 4"
Output (maximum) 1100 gpm at 10 psi

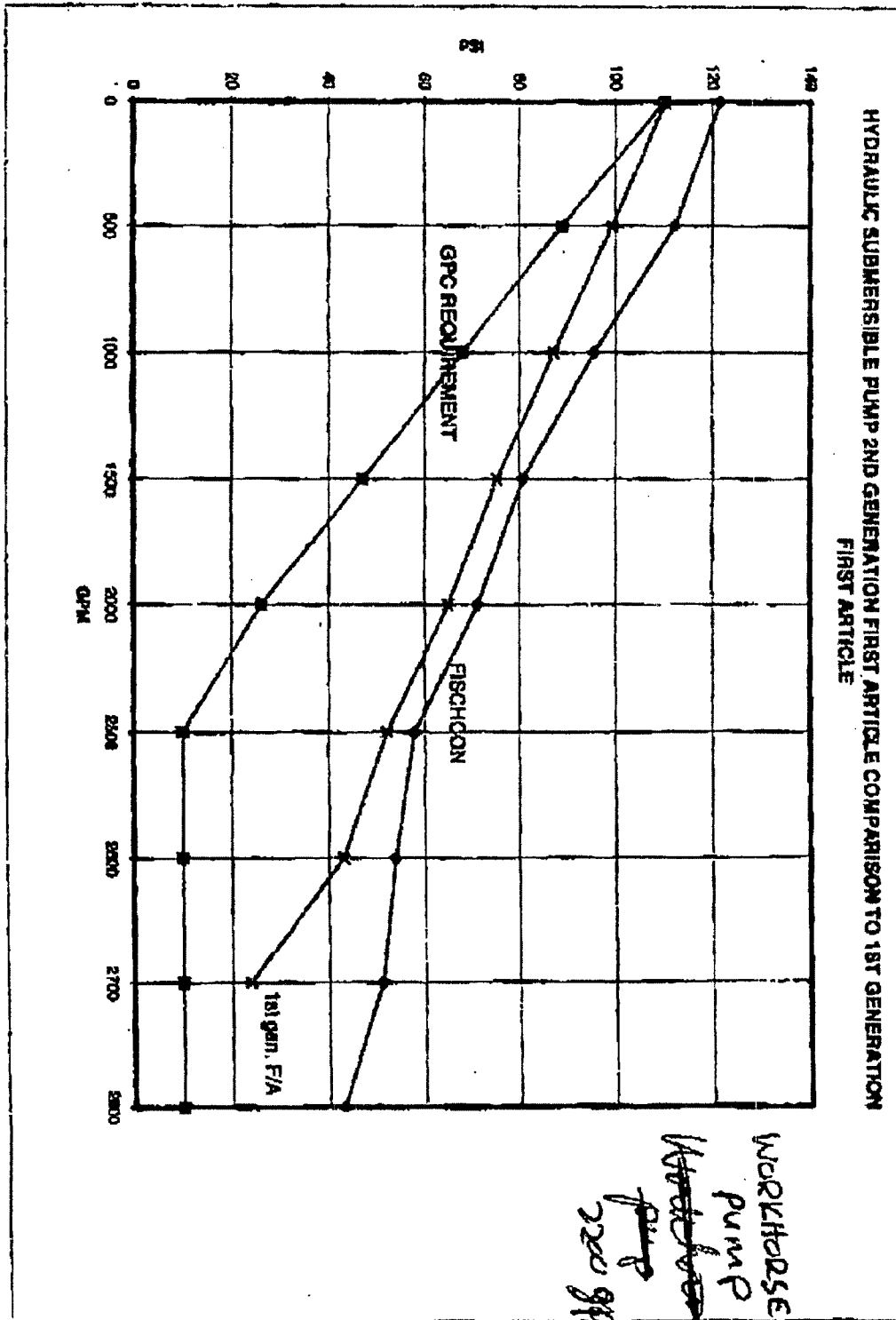
Motor

Manufacturer Parker Hannifin
Model M2A-254-16S
Operating pressure (max.) 2500 psi
Flow rate (maximum) 25 gpm

PERFORMANCE CURVE



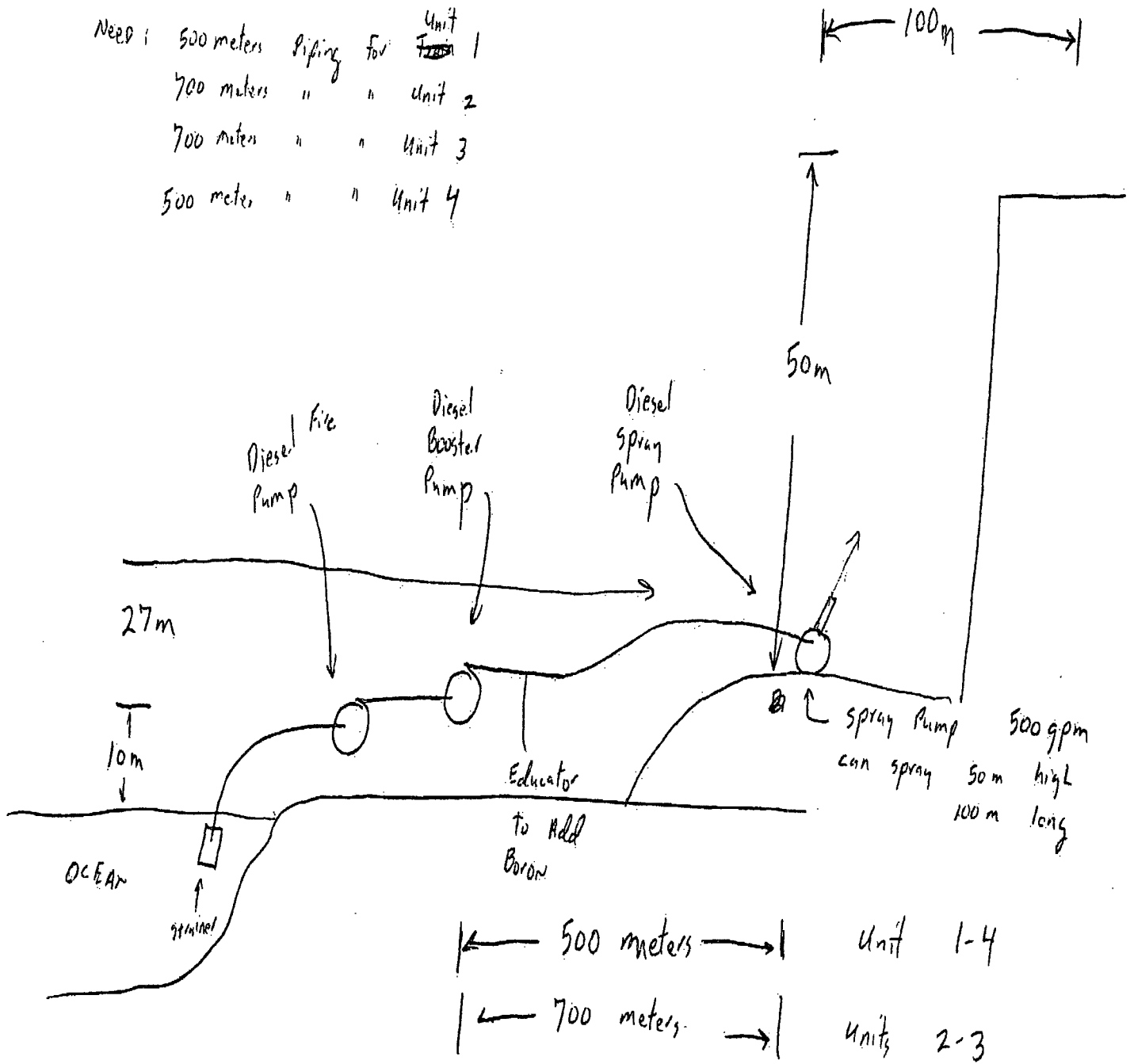
Performance Curve for PU0208 Pump



64

4 TRAINS NEEDED (Example shown is one TRAIN)

Need: 500 meters Piping for Unit 1
 700 meters " " Unit 2
 700 meters " " Unit 3
 500 meters " " Unit 4



Also need Diesel Trucks

Robots which can enter a high Radiation Field

713 235 2924

SHIPPING CONTAINER TALLY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

| | |
|---|--|
| REQUISITION AND INVOICE/SHIPPING DOCUMENT | OMB No. 0704-0246 GMS approval expires Apr 30, 2002 |
|---|--|

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| | | | | |
|--|--------------------------------------|---------------|--------------------------------------|-----------------------|
| 1. FROM (Include ZIP Code) N64101 NAVAL SHIP REPAIR FACILITY AND JAPAN MAINTENANCE CENTER PSC 476 BOX 16 FPO AP 96322-0091 POC: S. BROOKS (b)(6) 252-2837 | SHEET NO. | NO. OF SHEETS | 8. REQUISITION DATE | 6. REQUISITION NUMBER |
| | 1 | 4 | 20010316 | N64101-1075-W999 |
| | 7. DATE MATERIAL REQUIRED (YYYYMMDD) | | 8. PRIORITY | |
| | 2011 03 16 | | TPI | |
| 2. TO: (Include ZIP Code) SW3143 DEFENSE DISTRIBUTION DEPOT YOKOSUKA JAPAN SASEBO DIVISION PSC 473 BOX 8 FPO AP 96322-1505 | 9. AUTHORITY OR PURPOSE | | | |
| | ISO JAPAN NATIONAL EMERGENCY | | | |
| | 10. SIGNATURE | | 11. VOUCHER NUMBER & DATE (YYYYMMDD) | |
| | CHITO BEISON | | | |
| 3. SHIP TO - MARK FOR | 12. DATE SHIPPED (YYYYMMDD) | | b. | |
| YOKOTA AFB YOKOTA JAPAN | | | | |
| ATTN: NOACT YOKOTA | 13. MODE OF SHIPMENT | | 14. BILL OF LADING NUMBER | |
| TAC: NHBF | | | | |
| 15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO. | | | | |

| 4. APPROPRIATIONS DATA | AMOUNT |
|------------------------|--------|
| | |

| ITEM NO. (a) | FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIAL AND/OR SERVICES (b) | UNIT OF ISSUE (c) | QUANTITY REQUESTED (d) | SUPPLY ACTION (e) | TYPE CONTAINER (f) | CONTAINER NOS. (g) | UNIT PRICE (h) | TOTAL COST (i) |
|--------------|--|-------------------|------------------------|-------------------|--------------------|--------------------|----------------|----------------|
| 1. | PUMP SYS, SALVAGE 6" SUBMERSIBLE ESSM NO P20200 P202 UNIT HYD. DIE. SN: UH3704N0995829 SN: WH3704N1020299 GWT: 4162 LBS L: 101" W: 47" H: 55" CF: 151 | EA | 00002 | | | | | |
| 2. | ANCILLARY SET SYSTEM S18000-0008 ESSM No. P20207 SN: 008009 / SN: 007450 6" Hyd Pump P20295 GWT: 1670 LBS L: 62" W: 43" H: 66" CF: 102 | EA | 00002 | | | | | |

18. TRANSPORTATION VIA AWC OR MSC CHARGEABLE TO TAC NHBF 17. SPECIAL HANDLING

| | | | | | | | | | | |
|-----------|------------|------------------|----------------|-------------|--------------|------------|---|-----------------|----|---------------------------|
| RECEIPT | ISSUED BY | TOTAL CONTAINERS | TYPE CONTAINER | DESCRIPTION | TOTAL WEIGHT | TOTAL CUBE | 19. CONTAINERS RECEIVED EXCEPT AS NOTED | DATE (YYYYMMDD) | BY | SHEET TOTAL |
| | CHECKED BY | | | | | | 20. QUANTITIES RECEIVED EXCEPT AS NOTED | DATE (YYYYMMDD) | BY | GRAND TOTAL |
| | PACKED BY | | | | | | POSTED | DATE (YYYYMMDD) | BY | 20. RECEIVER'S VOUCHER NO |
| ← TOTAL → | | | | | | | | | | |

DD FORM 1149, JUL 2006

61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
PREVIOUS EDITION IS OBSOLETE

Circle Designer E.C.

CZ 61 of 2042

REQUISITION AND INVOICE/SHIPPING DOCUMENT

OMB No. 070-0246
OMB Approval Expires Apr 30, 2009

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| | | | | | |
|--|--|---|--------------------|---------------------------------------|---|
| 1. FROM: (Include ZIP Code) N64101 NAVAL SHIP REPAIR FACILITY AND JAPAN MAINTENANCE CENTER PSC 476 BOX 16 FPO AP 96322-0001 POC: S. BROOKS (b)(6) 252-2837 | | SHEET NO. 2 | NO. OF SHEETS 4 | 5. REQUISITION DATE 20010316 | 6. REQUISITION NUMBER N64101-1075-0999 |
| | | 7. DATE MATERIAL REQUIRED (YYYYMMDD) 2001 03 16 | | 8. PRIORITY TPI | |
| 2. TO: (Include ZIP Code) SW3143 DEFENSE DISTRIBUTION DEPOT YOKOSUKA JAPAN SASEBO DIVISION PSC 473 BOX 8 FPO AP 96322-1505 | | 9. AUTHORITY OR PURPOSE ISO JAPAN NATIONAL EMERGENCY | | | |
| | | 10. SIGNATURE CHITO DELEON | | 11a. VOUCHER NUMBER & DATE (YYYYMMDD) | |
| 3. SHIP TO - MARK FOR YOKOTA AFB YOKOTA JAPAN ATTN: NOACT YOKOTA TAC: NHBF | | 12. DATE SHIPPED (YYYYMMDD) | | b. | |
| | | 13. MODE OF SHIPMENT | | 14. BILL OF LADING NUMBER | |
| | | 15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO. | | | |

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| 4. APPROPRIATIONS DATA | AMOUNT |
|------------------------|--------|

| ITEM NO. (a) | FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIAL AND/OR SERVICES (b) | UNIT OF ISSUE (c) | QUANTITY REQUESTED (d) | SUPPLY ACTION (e) | TYPE CONTAINER (f) | CONTAINER NOS. (g) | UNIT PRICE (h) | TOTAL COST (i) |
|--------------|--|-------------------|------------------------|-------------------|--------------------|--------------------|----------------|----------------|
| 3. | PWR UNIT MOD 6 HYD DIESEL 52 GPM ESSM P100045 SN: 4D201837 Cwt: 3,840 LBS L: 96" W: 34" H: 52" CF: 110 | EA | 00001 | | | | | |
| 4. | APU MOD 6 ESSM P100045 SN: 4D201821 Cwt: 3,840 LBS L: 96" W: 34" H: 58" CF: 110 | EA | 00001 | | | | | |
| 5. | ANCI LARY SET FOR D00290 ESSM P100291 SN: 006585 Cwt: 1596 LBS W: 36" L: 62" H: 41" CF: 93 006586 | EA | 00002 | | | | | |
| C. | HYDRAULIC HOSE REEL ESSM: H00003 SN: 5191, 5193 WT: 780 LBS W: 35" L: 47" H: 49" CF: 43 5206, 5209 | EA | 00004 | | | | | |

16. TRANSPORTATION VIA AHC OR MSC CHARGEABLE TO TAC NHBF

| | | | | | | | | | | |
|-------------|------------|------------------|----------------|-------------|--------------|------------|---|-----------------|----|----------------------------|
| RECEIVED BY | ISSUED BY | TOTAL CONTAINERS | TYPE CONTAINER | DESCRIPTION | TOTAL WEIGHT | TOTAL CUBE | 19. CONTAINERS RECEIVED EXCEPT AS NOTED | DATE (YYYYMMDD) | BY | SHEET TOTAL |
| | CHECKED BY | | | | | | QUANTITIES RECEIVED EXCEPT AS NOTED | DATE (YYYYMMDD) | BY | GRAND TOTAL |
| | PACKED BY | | | | | | POSTED | DATE (YYYYMMDD) | BY | 20. RECEIVER'S VOUCHER NO. |
| | ← TOTAL → | | | | | | | | | |

REQUISITION AND INVOICE/SHIPPING DOCUMENT

OMB No. 0704-0245
OMB expires August 30, 2009

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| | | | | | |
|--|--|--|--------------------|---|---|
| 1. FROM: (include ZIP Code) N64101 NAVAL SHIP REPAIR FACILITY AND JAPAN MAINTENANCE CENTER PSC 476 BOX 16 FPO AP 96322-0001 POC: S. BROOKS (b)(6) 232-2837 | | SHEET NO. 3 | NO. OF SHEETS 4 | 9. REQUISITION DATE 20010316 | 8. REQUISITION NUMBER N64101-1075-W999 |
| 2. TO: (include ZIP Code) SW3145 DEFENSE DISTRIBUTION DEPOT YOKOSUKA JAPAN SASEBO DIVISION PSC 473 BOX 8 FPO AP 96322-1505 | | 7. DATE MATERIAL REQUIRED (YYYYMMDD) 2011 03 16 | | 8. AUTHORITY OR PURPOSE IN SUPPORT OF JAPAN NATL EMERGENCY | |
| 3. SHIP TO - MARK FOR YOKOTA AFB YOKOTA JAPAN ATTN: NOACT YOKOTA TAC: NHBF | | 10. SIGNATURE CHITO DELFIN | | 11. VOUCHER NUMBER & DATE (YYYYMMDD) | |
| | | 12. DATE SHIPPED (YYYYMMDD) | | 13. MODE OF SHIPMENT | |
| | | 14. BILL OF LADING NUMBER | | 15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO. | |

| 4. APPROPRIATIONS DATA | | AMOUNT |
|------------------------|--|--------|
| | | |

| ITEM NO. (a) | FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b) | UNIT OF ISSUE (c) | QUANTITY REQUESTED (d) | SUPPLY ACTION (e) | TYPE CONTAINER (f) | CON-TAINER NO. (g) | UNIT PRICE (h) | TOTAL COST (i) |
|--------------|--|-------------------|------------------------|-------------------|--------------------|--------------------|----------------|----------------|
| 1. | PUMP, JETTING 500 GPM ESSM PU 0280 SN: 3D35269 WT: 4070 LBS L: 110" W: 40" H: 78" CF: 199 | EA | 00001 | | | | | |
| 8. | WORKSTATION SYSTEM SN: 007998 WT: 848 LBS L: 63" W: 36" H: 46" CF: 61 | EA | 00001 | | | | | |
| 9. | ANCILLARY SET, FOR PU0280 ESSM: PU0281 SN: 214, 215 WT: 1469 LBS L: 63" W: 36" H: 42" CF: 56 | EA | 00002 | | | | | |

16. TRANSPORTATION VIA AMC OR MSC CHARGEABLE TO TAC NHBF 17. SPECIAL HANDLING

| RECEIVED BY | ISSUED BY | TOTAL CONTAINERS | TYPE CONTAINER | DESCRIPTION | TOTAL WEIGHT | TOTAL CUBE | 18. CONTAINERS RECEIVED EXCEPT AS NOTED | DATE (YYYYMMDD) | BY | SHEET TOTAL |
|-------------|------------|------------------|----------------|-------------|--------------|------------|---|-----------------|----|----------------------------|
| | CHECKED BY | | | | | | R | | | 0.00 |
| | PACKED BY | | | | | | E | | | |
| | | | | | | | QUANTITIES RECEIVED EXCEPT AS NOTED | DATE (YYYYMMDD) | BY | GRAND TOTAL |
| | | | | | | | POSTED | DATE (YYYYMMDD) | BY | 2A. RECEIVER'S VOUCHER NO. |
| ← TOTAL → | | | | | | | | | | |

CZ 63 of 2042

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OMB No. 0704-0245
OMB approval expires Apr 30, 2009

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| | | | | | |
|--|--|---|--------------------|--------------------------------------|--|
| 1. FROM: (Include ZIP Code) N64101 NAVAL SHIP REPAIR FACILITY AND JAPAN MAINTENANCE CENTER PSC 476 BOX 16 FPO AP 96322-0001 POC: S. BROOKS (b)(6) 252-2837 | | SHEET NO. 4 | NO. OF SHEETS 4 | 8. REQUISITION DATE 20110316 | 6. REQUISITION NUMBER N64101-1075-03999 |
| 2. TO: (Include ZIP Code) SW3143 DEFENSE DISTRIBUTION DEPOT YOKOSUKA JAPAN SASEBO DIVISION PSC 473 BOX 8 FPO AP 96322-1505 | | 7. DATE MATERIAL REQUIRED (YYYYMMDD) 20110316 | | 9. PRIORITY TP1 | |
| 3. SHIP TO - MARK FOR YOKOTA AFB YOKOTA JAPAN ATTN: NOACT YOKOTA TAC: NHBF | | 9. AUTHORITY OR PURPOSE ISO JAPAN NAFL EMERGENCY | | 10. SIGNATURE CHITO DELEON | |
| | | 12. DATE SHIPPED (YYYYMMDD) | | 11. VOUCHER NUMBER & DATE (YYYYMMDD) | |
| | | 13. MODE OF SHIPMENT | | 14. BILL OF LADING NUMBER | |
| | | 15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO. | | | |

| 4. APPROPRIATIONS DATA | | | | | | | | AMOUNT |
|------------------------|--|--|--|--|--|--|--|--------|
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| ITEM NO. (a) | FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIAL AND/OR SERVICES (b) | UNIT OF ISSUE (c) | QUANTITY REQUESTED (d) | SUPPLY ACTION (e) | TYPE CONTAINER NOS. (f) | CONTAINER NOS. (g) | UNIT PRICE (h) | TOTAL COST (i) |
|--------------|---|-------------------|------------------------|-------------------|-------------------------|--------------------|----------------|----------------|
| 10 | HYDRAULIC HOSE REEL FOR PU0200 ESSM: PU0201 SN: 006848, 007417 WT: 2214 LBS L: 53" W: 49" H: 66" CF: 99 | EA | 00002 | | | | | |
| 11 | AUXILIARY SET FOR PU02291/PU0230 SN: 0038505 WT: 162 LBS L: 36" W: 15" H: 28" CF: 9" | EA | 00001 | | | | | |

16. TRANSPORTATION VIA AMC OR MSC CHARGEABLE TO TAC NHBF

17. SPECIAL HANDLING

| | | | | | | | | | | |
|-------------|------------|------------------|----------------|-------------|--------------|------------|---|-----------------|----|----------------------------|
| RECEIVED BY | ISSUED BY | TOTAL CONTAINERS | TYPE CONTAINER | DESCRIPTION | TOTAL WEIGHT | TOTAL CUSE | 18. CONTAINERS RECEIVED EXCEPT AS NOTED | DATE (YYYYMMDD) | BY | SHEET TOTAL |
| | CHECKED BY | | | | | | QUANTITIES RECEIVED EXCEPT AS NOTED | DATE (YYYYMMDD) | BY | GRAND TOTAL |
| | PACKED BY | | | | | | POSTED | DATE (YYYYMMDD) | BY | 20. RECEIVER'S VOUCHER NO. |
| | ← TOTAL → | | | | | | | | | |

From: LIA11 Hoc
Sent: Thursday, March 17, 2011 12:32 AM
To: Merchant, Ned; ge.hitachinuclearresponseteam@ge.com
Cc: RST01 Hoc
Subject: Contact info

Categories: FOIA

All –

Here are the contact numbers I have –

Bechtel – 713-235-2924
GE-H – 910-819-1125

Look forward to talking at 0300 (EDT).

Thanks,
Scott

From: Merchant, Ned [mailto:cemercha@bechtel.com]
Sent: Wednesday, March 16, 2011 11:11 PM
To: LIA11 Hoc
Subject: RE: MIDNIGHT CALL INFO

Got it Scott.

Best Regards, Ned
"Quality is not an act, it is a habit"

From: LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]
Sent: Wednesday, March 16, 2011 10:07 PM
To: Merchant, Ned
Subject: MIDNIGHT CALL INFO

Ned –

Please call into the NRC Operations Center – 301-816-5100 – at midnight and ask for the “Pumping Bridge.”

Please confirm receipt.

Thanks,
Scott

From: Merchant, Ned [mailto:cemercha@bechtel.com]
Sent: Wednesday, March 16, 2011 10:20 PM

To: LIA11 Hoc
Subject: RE: FROM INPO -- industry support of Japan

Thanks

Best Regards, Ned
"Quality is not an act, it is a habit"

From: LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]
Sent: Wednesday, March 16, 2011 9:19 PM
To: Merchant, Ned
Subject: RE: FROM INPO -- industry support of Japan

These might be helpful...sorry.

From: Merchant, Ned [mailto:cemercha@bechtel.com]
Sent: Wednesday, March 16, 2011 10:12 PM
To: LIA11 Hoc
Subject: RE: FROM INPO -- industry support of Japan

Thanks Scott

Best Regards, Ned
"Quality is not an act, it is a habit"

From: LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]
Sent: Wednesday, March 16, 2011 9:11 PM
To: Merchant, Ned
Cc: RST01 Hoc
Subject: RE: FROM INPO -- industry support of Japan

Ned,

Please find 2 documents attached. First are the pump curves supplied from NR. Second is the procurement document, listing the articles that were delivered from NR to Yokota.

Please let me know if you have any questions or concerns. Talk to you at midnight (EDT).

Thanks,
Scott

From: Merchant, Ned [mailto:cemercha@bechtel.com]
Sent: Wednesday, March 16, 2011 9:55 PM
To: LIA11 Hoc
Subject: FW: FROM INPO -- industry support of Japan
Importance: High

Best Regards, Ned
"Quality is not an act, it is a habit"

From: Nielsen, Rick M (INPO) [mailto:NielsenFM@INPO.org]
Sent: Wednesday, March 16, 2011 3:40 PM
To: Merchant, Ned
Subject: FROM INPO -- industry support of Japan
Importance: High

Ned, I will call you in a few minutes, Rick Nielsen, INPO.

Rick Nielsen
Corporate Evaluations

INPO
770 644-8696 (office)
(b)(6) (cell)

In Pursuit of Excellence!

.DISCLAIMER:

~~This e-mail and any of its attachments may contain proprietary INPO or WANO information that is privileged, confidential, or protected by copyright belonging to INPO or WANO. This e-mail is intended solely for the use of the individual or entity for which it is intended. If you are not the intended recipient of this e-mail, any dissemination, distribution, copying, or action taken in relation to the contents of and attachments to this e-mail is contrary to the rights of INPO or WANO and is prohibited. If you are not the intended recipient of this e-mail, please notify the sender immediately by return e-mail and permanently delete the original and any copy or printout of this e-mail and any attachments.~~
Thank you.

| | | | |
|---|-----------------------------|--------------|---|
| <ul style="list-style-type: none"> • Ground-based 500 gpm water rocket, 30 m high, 60m delivery • Ladder trucks with monitor nozzles • 800 m rigid pipe with diesel pump booster • Strainers • bulldozers | NRC | Rick Nielsen | <ul style="list-style-type: none"> • Rob Gambone to clarify need and provide protocol for delivery. • Mark Lemke to discretely query Diablo Canyon and San Onofre of availability of equipment (feels they can provide based on B.5.b. requirements). |
| <p>Multiple trains of seawater pumps, booster pumps to transfer water 700 m. to 800 m. to the units, and high pressure pumps to support feeding water to spent fuel pools from ground level per earlier request. Also needed any associated piping, valves, etc. Japanese regulator also requested personnel to assist installation and operation of this equipment. NRC commented that this work would be performed in elevated dose fields (not specified).</p> | NRC, 1230 Wed 3/16 | | |
| • | | | • |

From: RMTPACTSU_ELNRC <RMTPACTSU_ELNRC@ofda.gov>
Sent: Wednesday, March 16, 2011 10:01 PM
To: LIA11 Hoc
Subject: RE: Air Radiation Sensors

Categories: FOIA, Red Category

Hey Scott,

Can't find any email at 846. Could you reforward? Thanks.

From: LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]
Sent: Wednesday, March 16, 2011 9:44 PM
To: RMTPACTSU_ELNRC
Subject: RE: Air Radiation Sensors

Thanks – what's the story on that list of requests from GoJ? Referencing your email from 8:46pm.

Scott

From: RMTPACTSU_ELNRC [mailto:RMTPACTSU_ELNRC@ofda.gov]
Sent: Wednesday, March 16, 2011 9:24 PM
To: LIA11 Hoc
Subject: RE: Air Radiation Sensors

Hi Scott,

I just took care of this. Thanks,

Jeff

From: LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]
Sent: Wednesday, March 16, 2011 8:37 PM
To: Hoc, PMT12
Cc: RMTPACTSU_ELNRC
Subject: FW: Air Radiation Sensors

PMT –

Please take a look at this and tell me what you think. My first reaction is to forward to DOE, but your input would be greatly appreciated.

Thanks,
Scott

From: RMTPACTSU_ELNRC [mailto:RMTPACTSU_ELNRC@ofda.gov]
Sent: Wednesday, March 16, 2011 8:27 PM
To: LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc; LIA08 Hoc; Gott, William
Subject: FYI: Air Radiation Sensors

Can we do anything with this? Please advise?

-Michael I. Dudek
US Nuclear Regulatory Commission

From: RMTPACTSU_ELC
Sent: Wednesday, March 16, 2011 8:07 PM
To: RMTPACTSU_ELNRC
Subject: FW: Air Radiation Sensors

Here is the name of the company in Connecticut that makes the air radiation sensors discussed last night. Do you have a list of specific questions on specs that you would like to submit to them? Please advise.

Thanks.

Phil

From: Zeitlin, Daniel [mailto:Daniel.Zeitlin@mail.house.gov]
Sent: Wednesday, March 16, 2011 9:52 AM
To: RMTPACTSU_ELC
Subject: RE: Air Radiation Sensors

Mr. Gelman,

Thank you for looking at this. Connecticut Analytical Corporation would like to share with Japanese authorities a U.S. patented technology they developed that would allow the Japanese to easily use a computer to re-program the smoke detector panels in many of their buildings in order to provide early detection and tracking of a radioactive dust cloud. It was designed to counter a radiological terror attack, and I believe it is something CAC has worked on with DHS.

Please contact:

Joe Bango
CEO
Connecticut Analytical Corporation
696 Amity Road (Route 63)
Bethany, Connecticut 06524
Phone: 203-393-9666
Email: jbango@ctanalytical.com

Thanks,
Dan

From: RMTPACTSU_ELC [mailto:RMTPACTSU_ELC@ofda.gov]
Sent: Tuesday, March 15, 2011 10:53 PM
To: Zeitlin, Daniel
Subject: Air Radiation Sensors

Dear Mr. Zeitlin:

Our colleagues on the ground in Japan are interested in learning more about the devices you mention. Could you provide me the contact information for the firm in your district that manufactures them?

Thanks in advance, and best regards.

Phil Gelman

External Liaison Coordinator
USAID Pacific Tsunami and Japan
Earthquake Response Management Team

From: Zeitlin, Daniel [mailto:Daniel.Zeitlin@mail.house.gov]
Sent: Tuesday, March 15, 2011 11:04 AM
To: Stammerman, Clifford (LPA/CL)
Subject: Question

Cliff: Hope everything is going well. Sorry Rosa's meeting with Shah was cancelled. You guys must be overwhelmed. We have a firm in our District that makes air radiation sensors and is interested in donating them to Japan. Don't know if this is a USAID thing or DOE thing, but want to point them in the right direction to see if there is an interest in taking them up on the offer.

Thanks,

Daniel Zeitlin
Legislative Director
Congresswoman Rosa L. DeLauro (CT-3)
2413 Rayburn House Office Building
Washington, D.C. 20515
Phone: 202-225-3661
Email: daniel.zeitlin@mail.house.gov

From: Murakami CIV Donn D <(b)(6)>
Sent: Wednesday, March 16, 2011 9:18 PM
To: LIA07 Hoc; LIA11 Hoc
Cc: Kerber CTR Mark D; MARFORPAC CAT ALLHAZ
Subject: RE: 1900 EDT (March 16, 2011) USNRC Earthquake/Tsunami SitRep

Categories: FOIA, Red Category

NRC,

Request you add the following DoD email accounts to your distro. We are directly supporting operation TOMODACHI relief effort.

(b)(6)

Thanks,
Donn

Donn Murakami, P.E.
Office of Naval Research Science Advisor
U.S. Marine Corps Forces Pacific
Office: (808) 477-8909
Cell: (b)(6)
Email: (b)(6)

-----Original Message-----

From: LIA07 Hoc [mailto:LIA07.Hoc@nrc.gov]
Sent: Wednesday, March 16, 2011 13:13
Subject: 1900 EDT (March 16, 2011) USNRC Earthquake/Tsunami SitRep

Attached, please find a 1600 EDT situation report from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami on March 13, 2011. This Update includes information related to NRC's evaluation of radiation measurements from the USS Ronald Reagan.

Please note that this information is "~~Official Use Only~~" and is only being shared within the federal family.

Please call the Headquarters Operations Officer at 301-816-5100 with questions.

-Sara

Sara K. Mroz

Communications and Outreach

Office of Nuclear Security and Incident Response

US Nuclear Regulatory Commission

sara.mroz@nrc.gov

LIA07.HOC@nrc.gov (Operations Center)

From: HOO Hoc
Sent: Friday, March 18, 2011 8:17 PM
To: LIA07 Hoc; OST01 HOC; OST02 HOC; OST03 HOC
Subject: FW: Japan Earthquake Response 18 March 1800 EDT Situation Report
Attachments: Japan_Earthquake_Response_03182011_1958.pdf

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

-----Original Message-----

From: NITOPS [mailto:NITOPS@nnsa.doe.gov]
Sent: Friday, March 18, 2011 8:16 PM

To: [redacted] (b)(6)

[redacted] (b)(6)

Cc: Miller, Neile; Johnson, Shane; Connery, Joyce; Kelly, John E (NE); Alldridge, David; Lyons, Peter; Owens, Missy; Adams, Ian; Sandalow, David; Smith-Kevern, Rebecca; Golub, Sal; Sunshine, Alexander; Deeney, Chris; Huizenga, David; Fremont, Douglas; Allen, George; Looney, Heather; White, William; Underwood, Jefferson; Durbin, Karyn; LeChien, Keith; Rasar, Kimberly; Whitney, Mark; Thompson, Michael; Ciganer, Patrick; Adamson, Paul; Calbos, Philip; Niedzielski-Eichner, Phillip; Wright, Rasheem; Hanrahan, Robert; Shrum, Scott; Goodrum, Steve; Mustin, Tracy; Visosky, Mark; Aoki, Steven; LaVera, Damien; Mueller, Stephanie; Leistikow, Dan; Reynolds, Tom; Hanrahan, Robert; Miotla, Dennis; Elkind, Jonathan; O'Connor, Tom (NE-HQ); Freshwater, David; Black, Steven K. (IN) (IN); 'sandra.willis@in.doe.gov'; Kreykes, Jon (IN); Higgins, Paul (LAB) (IN)

Subject: RE: Japan Earthquake Response 18 March 1800 EDT Situation Report

All,

This is the 1800 brief, compressed for re-transmission.

Nuclear Incident Team (NIT)
Office of Emergency Response (NA-42)
National Nuclear Security Administration U.S. Department of Energy nitops@nnsa.doe.gov nit@doe.sgov.gov 202-586-8100

-----Original Message-----

From: NITOPS

Sent: Friday, March 18, 2011 6:48 PM

To: [REDACTED] (b)(6)

[REDACTED] (b)(6)

Cc: Miller, Neile; Johnson, Shane; Connery, Joyce; Kelly, John E (NE); Alldridge, David; Lyons, Peter; Owens, Missy; Adams, Ian; Sandalow, David; Smith-Kevern, Rebecca; Golub, Sal; Sunshine, Alexander; Deeney, Chris; Huizenga, David; Fremont, Douglas; Allen, George; Looney, Heather; White, William; Underwood, Jefferson; Durbin, Karyn; LeChien, Keith; Rasar, Kimberly; Whitney, Mark; Thompson, Michael; Ciganer, Patrick; Adamson, Paul; Calbos, Philip; Niedzielski-Eichner, Phillip; Wright, Rasheem; Hanrahan, Robert; Shrum, Scott; Goodrum, Steve; Mustin, Tracy; Visosky, Mark; Aoki, Steven; LaVera, Damien; Mueller, Stephanie; Leistikow, Dan; Reynolds, Tom; Hanrahan, Robert; Miotla, Dennis; Elkind, Jonathan; O'Connor, Tom (NE-HQ); Freshwater, David; Black, Steven K. (IN) (IN); 'sandra.willis@in.doe.gov'; Kreykes, Jon (IN); Higgins, Paul (LAB) (IN)

Subject: Japan Earthquake Response 18 March 1800 EDT Situation Report

18MAR11 1850

Please find attached the latest DOE/NNSA SITREP regarding the ongoing earthquake and tsunami response in Japan.

The modeling results included in the Powerpoint file are sensitive as they are based on limited data from Japan and rely primarily on best judgment with conservatism, based on what we believe the current situation to be.

This information is provided for your internal use and should be shared only with those who have a need to know. Further distribution of this information outside of your agency should be pre-cleared with this office, which can be reach at NITOPS@nnsa.doe.gov (202-586-8100)

The SITREP will be updated every 12 hours.

Nuclear Incident Team (NIT)
Office of Emergency Response (NA-42)
National Nuclear Security Administration U.S. Department of Energy nitops@nnsa.doe.gov nit@doe.sgov.gov 202-586-8100

**Response to National Security Staff Regarding Earthquake &
Tsunami in Japan**

March 16, 2011
UPDATE 06001800

POWER PLANT UPDATE AND OTHER NUCLEAR ISSUES

(Summary of information received on 16 March from the NRC, Embassy-Tokyo, IAEA Incident and Emergency Center, TEPCO, Japan Atomic Industrial Forum, Nuclear Energy Institute)

Summary

NRC PA stated that they are recommending that American citizens who live within 50 miles (80 kilometers) of the Fukushima Nuclear Power Plant evacuate the area or to take shelter indoors if safe evacuation is not practical. An announcement will be made sometime on March 16th.

NRC has offered to send a support team to Japan. Awaiting decision at the Japanese cabinet level and MOFA.

Restoration of electrical power to the site was under way at the Daiichi plant as of 6:00 a.m. EDT Wednesday. A temporary cable was being connected between an off-site power line and Daiichi reactor 3. Off-site power has not been available at the site since the earthquake on March 11. [Source Nuclear Energy Institute News Feed]

Reactors 1, 2 and 3 at the plant are being cooled with seawater. There is some level of uranium fuel damage at all three units, and containment structure damage is suspected at reactor 2. [Source Nuclear Energy Institute News Feed]

~~The most recent radiation levels measured at the site have decreased.~~

~~Damage to primary containment integrity is suspected at Daiichi Units 2 and 3.~~

Additional efforts are focusing on maintaining used fuel pool cooling at Units 4, 5 and 6.

TEPCO is considering removing some panels from the top of the reactor containment buildings at reactors 5 and 6 in order to avert a possible buildup of hydrogen in the reactors. Hydrogen buildup caused explosions at reactors 1 and 3.

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NISA's position, relayed by NRC, is that the fire in Unit 4 on 15 MAR was not a spent fuel fire, but was an oil fire in the reactor building. No detailed information is available on a second 16 MAR fire at Unit 4. It was extinguished in 2 hours and it is unlikely that it involved fuel.

A report from NRC at 4:15 AM EDT 16 MAR suggests that a new explosion has damaged Unit 4 reactor building exposing used fuel.

~~Based on this information, and the information provided by the DOE/NRC dose protections, the NRC team has concluded that the protected actions recommended by the Japanese around the Fukushima are appropriate for American citizens at this time.~~

News Reports

CNN reported around 11:30 PM EDT 16 March that workers were evacuating Fukushima Daiichi. We believe this is in error and that what was being observed was a change in crew to limit exposure. News reports that high radiation levels led to the evacuation of all workers from the Fukushima Daiichi nuclear power station are not accurate. Workers were evacuated for about an hour but returned to the site to continue efforts to restore safe conditions at the plant. [Source Nuclear Energy Institute News Feed]

The NY Times reports Japan's Health Ministry said Tuesday it was raising the legal limit on the amount of radiation to which each worker could be exposed, to 250 millisieverts from 100 millisieverts, five times the maximum exposure permitted for American nuclear plants.

The NY Times reported on Tuesday that Radiation close to the reactors was reported to reach 400 milli sieverts per hour on Tuesday after a blast inside reactor No. 2 and fire at reactor No. 4, but has since dropped back to as low as 0.6 milli sieverts at the plant gate.

DOE Press

Following his testimony before the Subcommittee on Energy and Water Development of the House Committee on Appropriations, Secretary Chu held a media availability with reporters.

Additionally, Deputy Secretary Poneman conducted interviews with ABC News, CNN, Los Angeles Times and Reuters on the United States' efforts to assist Japan.

Media clips appearing throughout the day relating to DOE are attached.

Power Plant Update

Radiation Levels

At 10:22AM (JST) on March 15, a radiation level of 400 milli sievert per hour was recorded outside secondary containment building of the Unit 3 reactor at Fukushima Daiichi Nuclear Power Station.

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At 3:30PM on March 15, a radiation level of 0.6 milli sievert per hour was recorded at the main gate of Fukushima Daiichi Nuclear Power Station.

At 4:30PM on March 15, a radiation level of 0.5 milli sievert per hour was recorded on the site of the Fukushima Daiichi Nuclear Power Station.

At 11:00AM on March 16, radiation levels were 3.4 milli sievert per hour at the site boundary.

At 4:00 PM on March 16, radiation levels were at background levels at ~~Yakota~~Yokota airbase. For comparison, a human receives 2.4 milli sievert per year from natural radiation in the form of sunlight, radon, and other sources. One chest CT scan generates 6.9 milli sievert per scan.

Fukushima Daiichi Unit 1 reactor

Pressure inside the reactor core is 0.17 MPa. The water level inside the reactor was measured at 1.7 meters below the top of the fuel rods. TEPCO reports 70% of fuel rods are damaged; pumping seawater in for cooling.

Fukushima Daiichi Unit 2 reactor

At 6:14AM on March 15, an explosion was heard in the secondary containment building. TEPCO assumes that the suppression chamber, which holds water and steam released from the reactor core, was damaged. This was likely not a hydrogen explosion.

At 1:00PM on March 15, the pressure inside the reactor core was measured at 0.10 MPa. The water level inside the reactor was measured at 1.2 meters below the top of the fuel rods. TEPCO assumes 33% of the fuel rods are damaged; pumping seawater in for coolant.

Pressure inside the primary containment may continue to rise and eventually need to be released. Primary containment failure means that gases from reactor vessel may not be necessarily scrubbed in the pool prior to venting and will result in higher fission product release.

Fukushima Daiichi Unit 3 reactor

At 6:14AM on March 15, smoke was discovered emanating from the damaged secondary containment building.

Pressure inside the reactor core measured at 0.17 MPa. Water level inside reactor measured at 1.9 to 2.3 meters below the top of the fuel rods. TEPCO pumping seawater

Fukushima Daiichi Unit 4 reactor

On March 15, a fire was discovered on the third floor of the secondary containment building. It was caused by oil leakage from a cooling water pump. The large amount of combustibles in

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containment due to the refueling outage added to the conflagration. This was NOT a hydrogen explosion. TEPCO confirmed the fire was extinguishing.

At 5:45 am, March 16, Japan Standard Time (4:45 pm EDT, March 15), a fire reignited at Unit 4. The fire was extinguished after about two hours, TEPCO said.

A recent report suggests that a new explosion has damaged Unit 4 reactor building exposing used fuel.

Fukushima Daiichi Unit 5 reactor

Unit 5 was in a refueling outage at the time of the earthquake.

The reactor is stable; the reactor is being adequately cooled to maintain safety.

The level in the spent fuel pool is decreasing; preparations are underway to add water to the pools.

At 12:00 UTC on March 15 the water level in Unit 5 had decreased to 201 cm above the top of the fuel. This was a 40 cm decrease in the level since 07:00 UTC. Officials at the plant were planning to use an operational diesel generator in Unit 6 to supply water to Unit 5.

Fukushima Daiichi Unit 6 reactor

Unit 6 was in a refueling outage at the time of the earthquake.

The reactor is stable; the reactor is being adequately cooled to maintain safety.

Spent fuel pool temperatures are increasing

Fukushima Daini Units 1-4

TEPCO confirmed cold shutdown and continued cooling of reactor cores.

OTHER NUCLEAR ISSUES

NRC Evaluation of Radiation Measurements from the USS Ronald Reagan

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

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

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

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

DOE ASSESSMENT

[Factored into reactor summaries]

IAEA UPDATE:

Japanese authorities have informed the IAEA that a fire in the reactor building of unit 4 of the Fukushima Daiichi nuclear power plant was visually observed at 20:45 UTC of 15 March. As of 21:15 UTC of the same day, the fire could no longer be observed.

Japanese authorities have also informed the IAEA that at 12:00 UTC of 15 March the water level in unit 5 had decreased to 201 cm above the top of the fuel. This was a 40 cm decrease since 07:00 UTC of 15 March. Officials at the plant were planning to use an operational diesel generator in unit 6 to supply water to unit 5.

According to the IAEA, the Japanese national government completed evacuation of local residents within a 20km radius of the Fukushima Daiichi site boundary.

IAEA report on 03/15/11 (1219 UTC) that Japanese authorities reported the following dose rates on site at the main gate of the Fukushima Daiichi NPP. At 0000 UTC on 15 March, a dose rate of 11.9 mSv/hour was observed. Six hours later, at 0600 UTC on 15 March, a dose rate of 0.6 mSv/hour was observed. These observations indicate that the level of radioactivity has been decreasing at the site.

As reported earlier, a 400 mSv/hour radiation dose observed at Fukushima Daiichi occurred between Units 3 and 4. This is a high dose-level value, but it is a local value at a single location and at a certain point in time. The IAEA continues to confirm the evolution and value of this dose rate.

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It should be noted that because of this detected value, non-indispensible staff was evacuated from the plant, in line with the Emergency Response Plan, and that the population around the plant is already evacuated.

About 150 persons from populations around the Daiichi site have received monitoring for radiation levels. The results of measurements on some of these people have been reported and measures to decontaminate 23 of them have been taken.

REQUESTS FOR US ASSISTANCE

Total DART (Disaster Assistance Response Team) footprint: 210

USAID: 13 total

USAR: 144 total and 12 dogs (this is the number we are reporting, even though we now have 143)

NRC Team: 12 total

The purpose of the NRC team is to monitor the technical aspects of the nuclear events unfolding in Japan, specifically engage with the Ambassador's staff and Japanese authorities to better understand the status of the nuclear reactors at Fukushima Daiichi, units 1, 2, and 3. The NRC team will be headed by Disaster Communications Specialist who is set to arrive Tokyo, 1:30 pm on Wednesday, 3/16. We are working on the travel for the remaining NRC staff.

HHS Health Communications Team: 6 total

The team is composed of six health communication specialists with expertise in CBRNE issues. The team will :

- Provide support to the DART earthquake and tsunami in Japan.
- Develop and coordinate the distribution of health and safety related messages to the population of Japan that has been impacted by the earthquake and tsunami.
- Locations within Japan may vary, but it is anticipated that 2 specialists will be based in Tokyo with additional specialists deployed to various consulates near the affected regions.

DOE: 35 total

The team had two primary components:

- Consequence Management (CM) –is DOE's emergency response team to protect the public's health and safety of a radiological dispersal that results in contamination to the environment. It includes: scientific data assessment and radiation monitoring; management, coordination, and liaison function; data management with GIS product development; health physics kit supporting contamination surveys; and low volume air sampling.
- Aerial Measuring System (AMS) - is DOE's aerial emergency response capability for mapping radiological material deposited on the ground. It includes: aerial radiation detection systems with

US DEPARTMENT OF ENERGY

capabilities for sensitive radiation mapping and high-radiation field surveys; equipment can be mounted on up to two aircraft simultaneously; and deploys with a self-contained analytic capability.

Tailored CM (CMRT/AMS) arrived at ~~Yakota~~Yokota AB 1230EDT

1 Team installed air samplers on roof of US Tokyo Embassy (No elevated levels)

AMS equip installed on UH1, Completed 2 flights over ~~Yakota~~Yokota AB (Elevated Levels of Cs & I)

Met with US Emb staff to determine DoS monitoring priorities for AMS and Ground teams

Primary mission for DoD is environmental characterization for USF in AOR

DOE assets deployed at 2100 EDT 14 March 2011. The team arrived Yokota AFB at approximately 1255 EDT 15 March 2011.

These assets included:

1. The Aerial Measuring System (to give assessments of ground deposition of contamination)
2. A version of our Consequence Management Response Team (assess, survey, monitor, and sample)
3. Two-person teams with the right equipment will deploy to monitor US facilities in Japan

Total team contains about 33 People with equipment.

ENERGY INFRASTRUCTURE:

The Tokyo Electric Power Company (TEPCO) implemented rotating blackouts which began yesterday (March 14). The area experiencing the rotating blackouts has been split into five blocks, and each block will experience a blackout each day for three hours.

TEPCO is urging customers inside and outside the rotating blackout area to conserve their energy usage. The need for rotating blackouts is because the anticipated demand is growing higher than the available supply of electricity. The power supply into TEPCO from the Tokoku, Soma Kyodo, and Japan Atomic Electric Power Companies has been suspended.

In the TEPCO service area, the company reports a 6.248 MW loss of generating capacity. This includes the two Fukushima nuclear power facilities and damage to five other power plants

CONTACTS WITH JAPANESE

US DEPARTMENT OF ENERGY

[Nothing to report]

QUESTIONS BEING WORKED:

NSS requested modeling for the worst case scenario based on worst outcome for all reactors and weather. Response is being worked with NRC.

CONTACT INFORMATION:

**Nuclear Incident Team in the Emergency Operations Center
(NITOPS@NNSA.DOE.GOV) - 202-586-8100**

Office of the Deputy Secretary 202-586-5500

Watch Schedule

| | |
|------------------------|------------------------------------|
| Mustin/Connery | 0800/15 Mar to 1600/15 Mar |
| Ike White | 1600/15 Mar to 0000/16 Mar |
| David Huizenga | 0000/16 Mar to 0800/16 Mar |
| Phil Calbos | 0800/16 Mar to 1600/ 16 Mar |
| Douglas Fremont | 1600/16 Mar to 0000/17 Mar |

MEDIA ANNEX

The following media clips have appeared throughout the day relating to DOE:

LA Times: "Energy Secretary Steven Chu says Obama administration remains committed to nuclear power"

<http://www.latimes.com/news/politics/sc-dc-chu-nuclear-energy-20110316,0,6758322.story?track=rss>

Bloomberg: "Chu Says U.S. Doesn't Need to Suspend New Nuclear Plant Permits"

US DEPARTMENT OF ENERGY

<http://www.bloomberg.com/news/2011-03-15/chu-says-u-s-doesn-t-need-to-suspend-new-nuclear-plant-permits.html>

AFP: "US: Japan nuke crisis 'no concern' for US health"

<http://www.google.com/hostednews/afp/article/ALeqM5icJArmci-xHZrUHjglTMXmf5Zvvg?docId=CNG.ea7c289bc2e02432c2ceb3e9e0b7d793.251>

Reuters: "Energy chief: don't delay new nuclear plants"

<http://www.reuters.com/article/2011/03/15/us-nuclear-usa-idUSTRE72C2UW20110315>

CNN: "Energy secretary defends U.S. nuclear industry"

<http://www.cnn.com/2011/POLITICS/03/15/chu.nuclear.power/>

ABC – The Note: "DOE Sends Equipment, Personnel to Monitor Japan's Nuclear Crisis"

<http://blogs.abcnews.com/thenote/2011/03/doe-sends-equipment-personnel-to-monitor-japans-nuclear-crisis.html>

Fox News: "Energy Chief says We'll Learn from Japan"

<http://politics.blogs.foxnews.com/2011/03/15/energy-chief-says-we-ll-learn-japan>

WSJ: "U.S. Official: Latest Blast 'More Serious' Than Others"

http://online.wsj.com/article/SB10001424052748704662604576202443133881196.html?mod=googlenews_wsj

The Atlantic: "White House Standing Firm on Nuclear Energy"

<http://www.theatlantic.com/politics/archive/2011/03/white-house-standing-firm-on-nuclear-energy/72511/>

AP: "Energy chief: US will learn from Japan disaster"

<http://www.google.com/hostednews/ap/article/ALeqM5gQnLTyuM4q31LmxQVCnPHoateeDQ?docId=5ac00958f6214054a01a4500d6c01663>

Popular Science: "Secretary Chu Says U.S. Administration Remains Committed to Nuclear Power"

<http://www.popsci.com/science/article/2011-03/secretary-chu-says-administration-remains-committed-us-nuclear-power-industry>

Reuters: "No oil price trigger to tap US crude reserve – Chu"

<http://af.reuters.com/article/energyOilNews/idAFN1524992020110315>

CBS News: "Obama administration stands by nuclear power"

http://www.cbsnews.com/8301-503544_162-20043435-503544.html

National Journal: "It Doesn't Scare Me Anymore': Three Mile Island's Neighbors on Nuclear Power"

US DEPARTMENT OF ENERGY

<http://nationaljournal.com/politics/-it-doesn-t-scare-me-anymore-three-mile-island-s-neighbors-on-nuclear-power-20110315>

POLITICO: "Chu: U.S. can 'learn' from Japan"

http://www.politico.com/politico44/perm/0311/full_speed Ahead_b2bbd9af-79cc-4700-a05e-628d839baf1a.html

From: LIA01 Hoc
Sent: Wednesday, March 16, 2011 8:34 PM
To: LIA11 Hoc
Subject: FW: 6 Pump Request

Categories: FOIA, Red Category

From: Trapp, James
Sent: Wednesday, March 16, 2011 8:30 PM
To: Hughart, Joe
Cc: LIA01 Hoc; LIA08 Hoc
Subject: RE: 6 Pump Request

Can someone in HQ answer this question?

From: Hughart, Joe [jhughart@ofda.gov]
Sent: Wednesday, March 16, 2011 7:01 PM
To: Trapp, James
Subject: Fw: 6 Pump Request

From: Berger, William
To: Bock, Yoni; RMTFACTSU_RM; Berger, William (RDMA/OFDA) [USAID]; Magee, Erin K. (DCHA/OFDA)
Cc: ofdaPACOM; Hughart, Joseph (FOH); Amy Sink
Sent: Wed Mar 16 18:57:23 2011
Subject: Re: 6 Pump Request
Erin
Give this to Joe H to answer
Thanks
Bill

From: Bock, Yoni
To: RMTFACTSU_RM; Berger, William; Berger, William (RDMA/OFDA) [USAID]; Magee, Erin K. (DCHA/OFDA)
Cc: ofdaPACOM; Hughart, Joseph (FOH); Amy Sink
Sent: Wed Mar 16 07:15:13 2011
Subject: FW: 6 Pump Request
Bill/Erin,

Please see the email below regarding procurement of 6 pumps. Are these the same "pumps" that have been requested through the NRC reps in the pdf you recently circulated? Just want to avoid multiple taskings.

Thanks!
Yoni

Mr. Yonahton Bock
Military Liaison Officer / Civ-Mil Coordinator
Japan Earthquake/Tsunami DART
Email: ybock@usaid.gov
Blackberry (b)(6)

DNS at USFJ: 225-4329, 3137, 2469

From US (or non DSN) (011 81) 425 522-511
From Japan (non DSN) 0425 522-511
after dial tone, ext 54329, 52469, 53137

Current Location: Yokota AB, Tokyo, Japan
~~~~~

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**From:** Cote, Benjamin F LCDR USN USFJ J52 [mailto:(b)(6)]  
**Sent:** Wed 3/16/2011 7:09 AM  
**To:** Bock, Yoni  
**Cc:** USFJ-CAT-J5  
**Subject:** 6 Pump Request

Yoni,

Here's the current status regarding the request for 6 pumps:

Pending GOJ request for items to go to TEPCO (J4 item, but our piece is to keep Embassy in the loop and ensure the formal request from GOJ comes)

J4 and CAPT Tanaka spoke with TEPCO and got a list of needed items; all items are in country except hosing, which will need to be procured state side. J4 was hesitant to source without official GOJ request. Consultation between special projects officer (Corbett), J4, J5, CAT Ground, CAPT Tanaka and CAT Chief--I called Joe Young and got the green light to start movement based on expectation of a GOJ request (CAPT Tanaka will get JJS to route through MOD then MOFA). Also asked J4/CAPT Tanaka for a copy to provide to Embassy so that Embassy can push for a request on their end.

V/r,

Benjamin Cote, LCDR, USN  
Bilateral Plans Officer (J-52)  
United States Forces Japan  
DSN: 225-6914

(b)(6)

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**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Wednesday, March 16, 2011 8:30 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc; LIA08 Hoc; LIA04 Hoc; Harrington, Holly; McIntyre, David; Burnell, Scott; Gott, William; Grant, Jeffery; Marshall, Jane  
**Subject:** FYI: DART Deployment Schedule 03.16.11  
**Attachments:** image002.png; DART Deployment Schedule 03.16.11.xls  
  
**Categories:** FOIA, Red Category

**Subject:** DART Deployment Schedule 03.16.11

Please see attached schedule.

Regards,  
Natalya

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*Admin Coordinator  
Pacific Tsunami and Japan Earthquake Response Management Team  
USAID/DHCA/OFDA  
[Rmtpactsu\\_ac@ofda.gov](mailto:Rmtpactsu_ac@ofda.gov)  
202-712-0039*

# Pacific Tsunami DART

Departure times are local Arrival times are local

1/15/2013 2:02

| DART                                     | Name               | Current Location      | Departure             | Arrival           | Notes            | Total Days |          |          |           |           |           |           |           |           |
|------------------------------------------|--------------------|-----------------------|-----------------------|-------------------|------------------|------------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                                          |                    |                       |                       |                   |                  |            | Fri 11   | Sat 12   | Sun 13    | Mon 14    | Tue 15    | Wed 16    | Thur 17   | Fri 18    |
| Team Leader                              | Bill Berger        | Tokyo, Japan          |                       | BMI 0771 @1610    |                  | 8          |          | A        | x         | x         | x         | x         | x         | x         |
| Admin Coordinator                        | Sarah Potts        | Missawa AFB           |                       | Missawa @1522     | w/LA USAR        | 7          |          |          | A         | x         | x         | x         | x         | x         |
| Communications Officer                   | Marco Rivera       | Departing fr IAD      |                       | KE701 @1100       |                  | 6          |          |          |           | A         | x         | x         | x         | x         |
| Information Officer                      | Erin Magee         | Tokyo, Japan          |                       | GA 884 @0900      |                  | 7          |          |          | A         | x         | x         | x         | x         | x         |
| Deputy Team Leader                       | Courtney Brown     | Bangkok, Thailand     |                       | TG 676 @1600      |                  | 6          |          |          |           | A         | x         | x         | x         | x         |
| Field Officer                            | Amy Sink           | Tokyo, Japan          |                       | AA5835 @1605      |                  | 9          | A        | x        | x         | x         | x         | x         | x         | x         |
| Military Liaison Officer                 | Yoni Bock          | Inbound from Istanbul |                       | TK 0050 @1230     |                  | 6          |          |          |           | A         | x         | x         | x         | x         |
| Logistics Officer                        | Travis Betz        | Tokyo, Japan          |                       | QF 0021 @0605     | Transfer from NZ | 7          |          |          |           | A         | x         | x         | x         | x         |
| Operations Coordinator                   | Dewey Perks        | Missawa AFB           |                       | Missawa @1522     | w/LA USAR        | 7          |          |          |           | A         | x         | x         | x         | x         |
| Deputy Team Leader for Tech Team and SSO | Joe Hughart        | Tokyo, Japan          |                       | UA 0881 @1725     |                  | 7          |          |          |           | A         | x         | x         | x         | x         |
| DOE Liaison                              | Alan Remick        | Tokyo, Japan          |                       | UA 0897 @1635     |                  | 7          |          |          |           | A         | x         | x         | x         | x         |
| NRC Liaison                              | Anthony Ulses      | Tokyo, Japan          |                       | Missawa @1522     |                  | 7          |          |          |           | A         | x         | x         | x         | x         |
| NRC Liaison                              | James Trapp        | Tokyo, Japan          |                       | UA 9681 @2225     |                  | 7          |          |          |           | A         | x         | x         | x         | x         |
| Press Officer                            | Dave Stone         | Missawa AFB           |                       | Missawa @1522     |                  | 7          |          |          |           | A         | x         | x         | x         | x         |
| NRC Emergency Coordinator                | Chuck Casto        | Tokyo, Japan          |                       | AA 0175 @1330     | Narita           | 4          |          |          |           |           | A         | x         | x         |           |
| NRC Officer                              | Brooke Smith       | Tokyo, Japan          |                       | BA 0005 @0910     | Narita           | 4          |          |          |           |           | A         | x         | x         |           |
| NRC Officer                              | Richard Devercelly | Tokyo, Japan          |                       | DL 0275 @1615     | Narita           | 4          |          |          |           |           | A         | x         | x         |           |
| NRC Officer                              | Tim Kolb           | Tokyo, Japan          |                       | BA 0005 @0910     | Narita           | 4          |          |          |           |           | A         | x         | x         |           |
| NRC Officer                              | John Monninger     | Tokyo, Japan          |                       | BA 0005 @0910     | Narita           | 4          |          |          |           |           | A         | x         | x         |           |
| NRC Officer                              | Tony Nakanishi     | Tokyo, Japan          |                       | BA 0005 @0910     | Narita           | 4          |          |          |           |           | A         | x         | x         |           |
| NRC Officer                              | Jack Foster        | Tokyo, Japan          |                       | BA 0005 @0910     | Narita           | 4          |          |          |           |           | A         | x         | x         |           |
| NRC Officer                              | William Cook       | Tokyo, Japan          |                       | BA 0005 @0910     | Narita           | 4          |          |          |           |           | A         | x         | x         |           |
| NRC Officer                              | Kirk Foggie        | Tokyo, Japan          |                       | BA 0005 @0910     | Narita           | 4          |          |          |           |           | A         | x         | x         |           |
| Military Liaison Officer                 | Thomas Frey        | Tokyo, Japan          |                       | UNITED837 @1540   | Narita           | 4          |          |          |           |           | A         | x         | x         |           |
| Branch Chief for HHS Team                | Chris Howard       | Washington, DC        | Delta 3/17@1100       | Delta 0173 @1700  | Narita           | 2          |          |          |           |           |           |           |           | A         |
| SSO                                      | Bill Laspina       | Boise, ID             | UA 6398 3/17@0806     | UA 0837 @1540     | Narita           | 2          |          |          |           |           |           |           |           | A         |
| HHS Officer                              | Charles Miller     | Atlanta, GA           | AA 1673 3/17@0915     | AA 0061 @1530     | Narita           | 2          |          |          |           |           |           |           |           | A         |
| HHS Officer                              | Jana Telfer        | Atlanta, GA           | AA 1673 3/17@0915     | AA 0061 @1530     | Narita           | 2          |          |          |           |           |           |           |           | A         |
| HHS Officer                              | James Schwendinger | Atlanta, GA           | AA 1673 3/17@0915     | AA 0061 @1530     | Narita           | 2          |          |          |           |           |           |           |           | A         |
| HHS Officer                              | Oscar Tarrago      | Atlanta, GA           | AA 1673 3/17@0915     | AA 0061 @1530     | Narita           | 2          |          |          |           |           |           |           |           | A         |
| HHS Officer                              | Dr. Bader          | IAD                   | United 0846 3/17@0830 | United 0837 @1540 | Narita           | 2          |          |          |           |           |           |           |           | A         |
| HHS Officer                              | Dr. Coleman        | IAD                   | United 0846 3/17@0830 | United 0837 @1540 | Narita           | 2          |          |          |           |           |           |           |           | A         |
| <b>Daily TOTAL DART</b>                  |                    |                       |                       |                   |                  |            | <b>1</b> | <b>2</b> | <b>11</b> | <b>14</b> | <b>14</b> | <b>24</b> | <b>24</b> | <b>32</b> |



**Additional Regional Travl**

1/15/2013 2:02

| Traveler                  | Name           | Arrival - Tunisia                                    | Arrival - Egypt                                       | Return    | Total Days |          |          |          |          |
|---------------------------|----------------|------------------------------------------------------|-------------------------------------------------------|-----------|------------|----------|----------|----------|----------|
|                           |                |                                                      |                                                       |           |            | Mo       | Tu       | We       | Th       |
|                           |                |                                                      |                                                       |           |            | 7        | 8        | 9        | 10       |
| DCHA AA                   | Nancy Lindborg | Tunisia 3/8 CDG-TUN Air France 2584 @305p (605a EST) | Egypt 3/10 TUN-CAI Tunis Air TU 0813 @800p (100p EST) | 3/13/2011 | 2          |          | A        | x        |          |
| State/PRM A/S             | Eric Schwartz  | Tunisia 3/8 CDG-TUN Air France 2584 @305p (605a EST) | Egypt 3/10 TUN-CAI Tunis Air TU 0813 @800p (100p EST) | 3/12/2011 | 2          |          | A        | x        |          |
| State/PRM Staff Assistant | Lauren Diekman | Tunisia 3/8 CDG-TUN Air France 2584 @305p (605a EST) | Egypt 3/10 TUN-CAI Tunis Air TU 0813 @800p (100p EST) | 3/12/2011 | 2          |          | A        | x        |          |
| <b>Daily TOTAL</b>        |                |                                                      |                                                       |           |            | <b>0</b> | <b>3</b> | <b>3</b> | <b>0</b> |

March

| Fr | Sa | Su | Mo | Tu | We | Th | Fr | Sa | Su | Mo | Tu | We | Th | Fr | Sa | Su | Mo | Tu | We | Th |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |

**From:** RMPACTSU\_ELNRC <RMPACTSU\_ELNRC@ofda.gov>  
**Sent:** Wednesday, March 16, 2011 7:55 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc; LIA08 Hoc; Harrington, Holly; McIntyre, David; Burnell, Scott; Gott, William  
**Subject:** 03.16.11 - USAID/DCHA Japan Earthquake and Tsunami Fact Sheet #6  
**Attachments:** att61a77.gif; 03.16.11 - Japan EQ and Tsunami Program Map.pdf; 03.16.11 - USAID-DCHA Japan EQ and Tsunami Fact Sheet #6.pdf

**Categories:** FOIA, Red Category

**Subject:** 03.16.11 - USAID/DCHA Japan Earthquake and Tsunami Fact Sheet #6

Please find attached and pasted below the USAID/DCHA Japan Earthquake and Tsunami Fact Sheet #6 and accompanying map, both dated March 16, 2011. These documents have been approved for public use.

If you experience formatting issues in the text below, please refer to the attached document.

To be added to or removed from this distribution list, please email rmpactsu\_inc@ofda.gov.

## **Japan – Earthquake and Tsunami**

Fact Sheet #6,

Fiscal Year (FY) 2011

March 16, 2011

*Note: The last fact sheet was dated March 15, 2011.*

### **KEY DEVELOPMENTS**

- As of March 16, the earthquake and tsunami have resulted in 4,314 deaths and left 8,616 people missing, according to the Government of Japan (GoJ).
- On March 16, the two USAID-supported urban search and rescue (USAR) teams deployed with the U.S. Government (USG) Disaster Assistance Response Team (DART) completed search assignments in southern Ofunato City, Iwate Prefecture, and Kamaishi City, located approximately 25 miles north of Ofunato, but did not detect any live victims. USAR teams plan to conduct another search assignment on March 17.
- On March 16, the U.S. Embassy in Tokyo issued a statement, noting that the U.S. Nuclear Regulatory Commission (NRC), the U.S. Department of Energy (DoE), and other technical experts in the U.S. Government have reviewed the scientific and technical information in response to the deteriorating situation at the Fukushima nuclear power plant. The U.S. Embassy in Tokyo recommended, as a precaution, that American citizens who live within 50 miles (80 kilometers) of the plant evacuate the area or take shelter indoors if safe evacuation is not practical.

| NUMBERS AT A GLANCE <sup>[1][1]</sup> | SOURCE  |                                            |
|---------------------------------------|---------|--------------------------------------------|
| <b>Confirmed Deaths</b>               | 4,314   | GoJ NPA <sup>[2][2]</sup> – March 16, 2011 |
| <b>Missing Persons</b>                | 8,606   | GoJ NPA – March 16, 2011                   |
| <b>Number of People Evacuated</b>     | 492,355 | OCHA <sup>[3][3]</sup> – March 16, 2011    |

### **FY 2011 HUMANITARIAN FUNDING PROVIDED TO JAPAN TO DATE**

**USAID/OFDA Assistance for the Japan Earthquake and Tsunami** \$6,125,337

**Total USAID Humanitarian Assistance for the Japan Earthquake and Tsunami..** \$6,125,337

**Total Planned Assistance from USAID for the Japan Earthquake and Tsunami.....** \$8,000,000

### **CONTEXT**

- On March 11 at 0046 hours Eastern Standard Time (EST), or 1446 hours Japan Standard Time (JST), a magnitude 9.0 earthquake occurred east of Honshu—the largest and main island of Japan—at a depth of approximately 15 miles. The epicenter of the

earthquake was located 80 miles east of Sendai, the capital of Miyagi Prefecture, and 231 miles northeast of Tokyo. The earthquake generated a large tsunami that resulted in additional fatalities and damage, particularly in Miyagi, Fukushima, and Iwate prefectures.

- On March 11, U.S. Ambassador to Japan John V. Roos declared a disaster due to the effects of the earthquake and tsunami. In response, USAID/OFDA provided an initial \$100,000 through the U.S. Embassy in Tokyo to assist with local relief efforts. USAID deployed a DART—including two USAR teams from Fairfax County, Virginia, and Los Angeles County, California—to Japan to coordinate USG response and support Japanese USAR efforts. In addition, USAID activated a Response Management Team (RMT) in Washington, D.C.
- InterAction, an alliance of U.S.-based non-governmental organizations (NGOs), maintains a list of organizations accepting donations for the Japanese earthquake response. The American Red Cross (AmRC) accepts donations through text messages of “redcross” sent to 90999.

#### ***USAR Operations and Logistics***

- To date, the U.S. Department of Defense (DoD) has conducted 113 helicopter and 125 aircraft missions to support survivor recovery efforts, transportation of personnel, and distribution of more than 129,000 pounds of water and 4,200 pounds of food assistance. In addition, the III Marine Expeditionary Force has facilitated re-opening of an airfield in Sendai. DoD continues to support search and rescue operations at sea via use of aerial and surface assets.
- The Ministry of Agriculture, Forestry, and Fisheries of Japan (MAFF) announced that the GoJ will issue an emergency transportation pass for vehicles transporting food and livelihood supplies, including fuel, to affected areas, as reported by OCHA.

#### ***Shelter and Settlements***

- More than 430,000 people have evacuated their homes and are currently living in temporary shelters—including in public buildings such as schools, sports centers, and community centers—in seven prefectures, according to OCHA. The GoJ Ministry of Land, Infrastructure, Transport, and Tourism has ordered 600 temporary shelters to be constructed within two weeks, with an additional 4,200 shelters constructed in four weeks and 30,000 shelters in two months. A GoJ official is working to secure land for these shelters in Iwate, Miyagi, and Fukushima prefectures.

#### ***Emergency Food Assistance***

- The MAFF is coordinating with the private sector to mobilize food and water rations, according to OCHA.

#### ***Water, Sanitation, and Hygiene***

- The estimated number of individuals lacking access to water has increased from 1.4 million to 1.6 million, according to OCHA. The GoJ is coordinating with 245 water supply companies to secure emergency water supply. The GoJ has arranged to send 314 water supply vehicles to the most affected areas, and local authorities have supplied safe drinking water.

#### ***Health***

- More than 100 Japanese Disaster Medical Assistance Teams (DMATs) are in Iwate, Miyagi, and Fukushima prefectures, according to OCHA. In addition, the Japanese Red Cross Society has 85 medical teams in affected areas.

#### ***Nuclear Infrastructure***

- On March 16, nine NRC staff members joined the DART, bringing the number of NRC personnel on the DART to 11. Nuclear specialists on the DART—including 11 NRC officers, 1 DoE officer, and 1 U.S. Department of Health and Human Services (HHS) officer—are monitoring technical aspects of the nuclear issues at the Fukushima Daiichi nuclear power plant, engaging with GoJ officials on the status of the health impacts of radiation, and providing guidance to the U.S. Embassy in Tokyo on efforts to cool reactors.
- In response to the ongoing situation at the Fukushima nuclear plant, two DoD Humanitarian Assistance Survey Teams with chemical, biological, radiological, and nuclear expertise have positioned at Sendai and Yamagata cities, and a U.S. Northern Command contingent is traveling to Japan for crisis management planning.
- The NRC Headquarters Operations Center is staffed and is monitoring and analyzing the events in Japan. NRC is providing regular status updates to the USG community and the public.

#### ***Humanitarian Needs***

- DART staff continue to clarify requests from the GoJ and ascertain the needs of the GoJ and affected populations.
- The DART continues to meet and coordinate with the U.N. Disaster Assessment and Coordination team, the Japan Platform, the Japan International Cooperation Agency, the GoJ Ministry of Foreign Affairs, and the European Commission’s Humanitarian Aid department for information sharing on emerging needs.
- The USG is responding to specific limited requests from the GoJ for technical and material assistance; however, the GoJ continues to express a preference for financial assistance.

#### ***International Donor Support***



- The GoJ has received 113 offers of assistance and has accepted 14 of these offers, according to OCHA. Media reports indicate that China, Mongolia, Taiwan, and Thailand have each pledged \$1 million or more, with Estonia, Vietnam, Cambodia, the Maldives, and Afghanistan each pledging between \$50,000 and \$260,000.

### USAID HUMANITARIAN ASSISTANCE TO JAPAN

| <i>Implementing Partner</i>  | <i>Activity</i>                           | <i>Location</i> | <i>Amount</i>      |
|------------------------------|-------------------------------------------|-----------------|--------------------|
| <b>USAID/OFDA ASSISTANCE</b> |                                           |                 |                    |
| U.S. Embassy in Tokyo        | Emergency Relief Support                  | Affected Areas  | \$100,000          |
| DoD                          | USAR Operations (Transport of USAR teams) | Affected Areas  | \$1,000,000        |
| L.A. County USAR Team        | USAR Operations                           | Affected Areas  | \$2,058,000        |
| Fairfax County USAR Team     | USAR Operations                           | Affected Areas  | \$2,058,000        |
| HHS                          | Health                                    | Affected Areas  | \$93,360           |
|                              | USAID/DART Support Costs                  |                 | \$615,600          |
|                              | Administrative Support                    |                 | \$200,377          |
| <b>TOTAL USAID/OFDA</b>      |                                           |                 | <b>\$6,126,337</b> |

<sup>1</sup> USAID/OFDA funding represents anticipated or actual obligated amounts as of March 16, 2011.

### PUBLIC DONATION INFORMATION

- The most effective way people can assist relief efforts is by making cash contributions to humanitarian organizations that are conducting relief operations. A list of humanitarian organizations that are accepting cash donations for earthquake and tsunami response efforts in Japan can be found at [www.interaction.org](http://www.interaction.org).
- USAID encourages cash donations because they allow aid professionals to procure the exact items needed (often in the affected region); reduce the burden on scarce resources (such as transportation routes, staff time, warehouse space, etc.); can be transferred very quickly and without transportation costs; support the economy of the disaster-stricken region; and ensure culturally, dietary, and environmentally appropriate assistance.
- More information can be found at:
  - USAID: [www.usaid.gov](http://www.usaid.gov)
  - The Center for International Disaster Information: [www.cidi.org](http://www.cidi.org) or (703) 276-1914
  - Information on relief activities of the humanitarian community can be found at [www.reliefweb.int](http://www.reliefweb.int)

USAID/OFDA bulletins appear on the USAID web site at [http://www.usaid.gov/our\\_work/humanitarian\\_assistance/disaster\\_assistance/](http://www.usaid.gov/our_work/humanitarian_assistance/disaster_assistance/)

**Diedra Spencer and Helen Ho**  
*Information Coordinators*  
Japan Earthquake and Tsunami Response Management Team  
202-712-0039  
[rmtpactsu\\_inc@ofda.gov](mailto:rmtpactsu_inc@ofda.gov)

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<sup>[1][1]</sup> Figures remain preliminary and are expected to change.

<sup>[2][2]</sup> National Police Agency (NPA).

<sup>[3][3]</sup> U.N. Office for the Coordination of Humanitarian Affairs (OCHA).



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**From:** LIA01 Hoc  
**Sent:** Wednesday, March 16, 2011 7:42 PM  
**To:** LIA11 Hoc  
**Subject:** FW: HOT requirement to move JET STREAM pumps  
  
**Categories:** FOIA, Red Category

-----Original Message-----

From: Morris, Scott  
Sent: Wednesday, March 16, 2011 7:36 PM  
To: LIA01 Hoc; Ruland, William  
Subject: FW: HOT requirement to move JET STREAM pumps

-----Original Message-----

From: Merchant, Ned [mailto:cemercha@bechtel.com]  
Sent: Wednesday, March 16, 2011 7:35 PM  
To: Morris, Scott; RST01 Hoc  
Cc: Kozal, Jason  
Subject: RE: HOT requirement to move JET STREAM pumps

Scott,

Please advise as to the next steps you would like Bechtel to take to support this effort. I am leaving the office now, but will be monitoring my emails tonight, and I am available by phone. Please do hesitate to contact me.

My contact info is as follows:

713-235-2924 (W)  
(b)(6) (Cell)  
[cemercha@bechtel.com](mailto:cemercha@bechtel.com)

Looking forward to working with you.

Best Regards, Ned Merchant  
VP & General Manager  
Bechtel Supplier Quality & Expediting Inc  
"Quality is not an act, it is a habit"

-----Original Message-----

From: Morris, Scott [mailto:Scott.Morris@nrc.gov]  
Sent: Wednesday, March 16, 2011 6:29 PM

To: RST01 Hoc; Merchant, Ned  
Cc: Kozal, Jason  
Subject: FW: HOT requirement to move JET STREAM pumps

-----Original Message-----

From: [redacted] (b)(6)  
Sent: Wednesday, March 16, 2011 7:25 PM  
To: Morris, Scott; [redacted] (b)(6)  
Subject: FW: HOT requirement to move JET STREAM pumps

-----Original Message-----

From: Chansipaeng, Sonthaya LCDR USN NAVFACFE  
Sent: Thursday, March 17, 2011 8:24 AM  
To: NACCC.CDBRG.FCT  
Subject: FW: HOT requirement to move JET STREAM pumps

v/r

Sonny Chansipaeng, P.E.  
LCDR, CEC, USN  
Facilities Management Officer  
Public Works Department Yokosuka  
Comm 046-816-7543  
DSN 315-243-7543  
Cell [redacted] (b)(6)

-----Original Message-----

From: Neu, Charles R LCDR USN FISC  
Sent: Wednesday, March 16, 2011 12:38 PM  
To: 'Piburn, James CAPT (C7F N4)'  
Cc: Sexton, Neil CDR SRF S100; Sweat, Tyheem LTJG USN CSG7; Stancy, Steven L CAPT SRF CO; Manders, Bill CDR SRF XO; M-YO-FISCY-LOC; Chansipaeng, Sonthaya LCDR USN NAVFACFE; [redacted] (b)(6)  
Subject: FW: HOT requirement to move JET STREAM pumps

Captain Piburn,

BLUF - The 5th pump sent from Sasebo will be required for the water to reach the last 50 meters (vertical).

Background -

The pumps will be operated in parallel to pull water from the source, then 500 meters over ground, and then vertically 50 meters. This 5th pump will be required to make the 90psi at discharge after the 50 meter vertical climb. Both NAVSEA and SRF-JRMC engineers concurred that this pump will be needed. This "fifth" pump is attached as file PU0230.pdf.

There is another of this PU0230 in Sasebo.

Operations -

These are meant to be operated by ship-salvage specialists (US Navy Salvage divers and NAVSEA OOC contractors). These pumps have operating placards attached. Attached to this e-mail are the technical specs and the only "operating manual" for these pumps (less the operating placards attached to the units).

Personnel -

Two (2) Navy CTF-73 divers ("riding" SAFEGUARD)(LCDR Peterson and one Master Diver) are enroute to Yokota from Yokosuka.  
Two (2) MLC Divers from the SRF-JRMC Dive Shop are standing by to move to Yokota to accompany the gear and assist in operations.

Additional information on the pumps is available -

[http://www.supsalv.org/essm/Sal\\_Inv.asp](http://www.supsalv.org/essm/Sal_Inv.asp)

Semper Supply!

Very respectfully,  
LCDR Chuck Neu, SC, USN  
FISCY Logistics Operations Center

For all Operation Tomodachi traffic use:

(b)(6)

DSN: 315-243-6467/5238

Commercial: 011-81-46-816-6467

email: (b)(6)

SIPR: (b)(6)

cell: (b)(6)

---

**From:** LIA08 Hoc  
**Sent:** Wednesday, March 16, 2011 7:27 PM  
**To:** RMTFACTSU\_ELNRC; LIA02 Hoc; LIA11 Hoc; LIA01 Hoc; LIA07 Hoc  
**Subject:** RE: HELP - Tony Ulses emergency info pls - URGENT

**Importance:** High

**Categories:** FOIA, Red Category

(b)(6)

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**From:** RMTFACTSU\_ELNRC [mailto:RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Wednesday, March 16, 2011 7:21 PM  
**To:** LIA02 Hoc; LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA08 Hoc  
**Subject:** HELP - Tony Ulses emergency info pls - URGENT

Can you help me out?

---

**From:** RMTFACTSU\_AC  
**Sent:** Wednesday, March 16, 2011 7:18 PM  
**To:** RMTFACTSU\_ELNRC  
**Subject:** RE: Tony Ulses emergency info pls - URGENT

Who is the emergency POC? And his/her contact numbers

*Admin Coordinator  
Pacific Tsunami and Japan Earthquake Response Management Team  
USAID/DHCA/OFDA  
[Rmtpactsu\\_ac@ofda.gov](mailto:Rmtpactsu_ac@ofda.gov)  
202-712-0039*

---

**From:** RMTFACTSU\_ELNRC  
**Sent:** Wednesday, March 16, 2011 7:17 PM  
**To:** RMTFACTSU\_AC  
**Subject:** RE: Tony Ulses emergency info pls - URGENT

ULSES, ANTHONY P.

(b)(6)

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**From:** RMTFACTSU\_AC  
**Sent:** Wednesday, March 16, 2011 7:12 PM  
**To:** RMTFACTSU\_ELNRC  
**Subject:** Tony Ulses emergency info pls - URGENT

*Admin Coordinator  
Pacific Tsunami and Japan Earthquake Response Management Team  
USAID/DHCA/OFDA  
[Rmtpactsu\\_ac@ofda.gov](mailto:Rmtpactsu_ac@ofda.gov)*





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**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 6:53 PM  
**To:** RMTPACTSU\_ELNRC  
**Cc:** PMT01 Hoc; LIA01 Hoc  
**Subject:** RE: Request for Onsite Meteorological Tower

**Categories:** FOIA

This is a request from PMT. Please let me know if I need to send it somewhere else.

Thanks,  
Scott

---

**From:** PMT01 Hoc  
**Sent:** Wednesday, March 16, 2011 6:43 PM  
**To:** LIA01 Hoc; LIA11 Hoc  
**Cc:** PMT01 Hoc  
**Subject:** Request for Onsite Meteorological Tower

Liaison Team,

Please pass this request on to the entities as you see fit. If you have any questions please let me know.

Background:

Due to the earthquake and subsequent tsunami, all available representative meteorological reporting stations operated by the Japan Meteorological Agency (JMA) have been unavailable in the area around the Fukushima Daiichi nuclear plant. We are in the process of trying to verify the operational status of Tokyo Electric's onsite meteorological monitoring system(s). Since March 12, 2011, the NRC staff has been relying on meteorological reporting stations at Sendai (50 miles to the north) and Onahama (35 miles to the south) for meteorological conditions in the site area.

The NRC International Liaison Team has sent an email to the JMA requesting any local meteorological observations or area specific forecasts that are not available through the JMA's official website. This request was sent Tuesday evening at approximately 8 PM EST, but we have not yet received a formal reply.

It is important to establish onsite meteorological conditions to check the reasonability of model-predicted meteorological conditions that are currently being used run atmospheric dispersion and dose assessment models.

Request for Action:

What is the possibility to have a portable 10-meter meteorological tower deployed at or near the site including arrangements for its siting, installation, calibration, data recording and/or transmittal?

---

**From:** Putthoff CDR Douglas E <(b)(6)>  
**Sent:** Wednesday, March 16, 2011 6:46 PM  
**To:** LIA11 Hoc  
**Subject:** RE: NRC Status Update  
  
**Categories:** FOIA, Red Category

Scott: got it. Thank you!

VR/Doug

-----Original Message-----

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Thursday, March 17, 2011 7:45  
**To:** Putthoff CDR Douglas E  
**Subject:** NRC Status Update

Doug,

Please find the NRC's latest status update attached. Give us a ring if you have any questions or further concerns.

Thanks,

Scott Sloan

Federal Liaison

NRC Operations Center

(301) 816-5186

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 6:45 PM  
**To:** [REDACTED] (b)(6)  
**Subject:** NRC Status Update  
**Attachments:** SITREP 0316 @1400.docx  
  
**Categories:** FOIA

Doug,

Please find the NRC's latest status update attached. Give us a ring if you have any questions or further concerns.

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

---

**From:** RMPACTSU\_ELNRC <RMPACTSU\_ELNRC@ofda.gov>  
**Sent:** Wednesday, March 16, 2011 6:41 PM  
**To:** LIA11 Hoc; LIA07 Hoc; LIA01 Hoc; LIA02 Hoc; LIA08 Hoc; Harrington, Holly; Grant, Jeffery; Gott, William; McIntyre, David; Burnell, Scott  
**Subject:** OCHA Situation Report, no 5, Japan earthquake and tsunami, 16March  
**Attachments:** OCHA Japan SitMap 5\_110316.pdf; OCHA Situation Report on Japan emergency issue 5 16 March.pdf  
  
**Categories:** FOIA, Red Category

**Subject:** OCHA Situation Report, no 5, Japan earthquake and tsunami, 16March

Dear Colleagues,

Please find attached OCHA Situation Report No. 5, dated 16 March 2011, on the Japan earthquake and tsunami, together with the updated Situation Map. The Report and map was issued by the OCHA Regional Office for Asia Pacific.

**HIGHLIGHTS/KEY PRIORITIES**

- Snow and freezing temperatures hit the most affected areas
- Food, water and fuel shortages are the main concerns
- The Government orders 600 temporary shelters to be built within two weeks
- Fukushima Nuclear Power Plant crisis is still not under control with a fourth explosion

**PLEASE NOTE:**

As these reports become more and more focused on the in-country humanitarian operation, **OCHA-Pacific will no longer push out these situation reports via email.**

We continue, however, to actively monitor the situation and will resume distribution should the situation develop as to directly concern countries in the Pacific.

For those interested in following the situation, daily updates and situation reports can be found here:

<http://www.reliefweb.int/rw/dbc.nsf/doc108?OpenForm&emid=EQ-2011-000028-JPN&rc=3>

For specific health concerns regarding the situation developing in Japan's nuclear reactors, please refer to the World Health Organization's web pages on Japan EQ:

[http://www.wpro.who.int/sites/eha/disasters/2011/jpn\\_earthquake/list.htm](http://www.wpro.who.int/sites/eha/disasters/2011/jpn_earthquake/list.htm)

<http://www.who.int/hac/crises/jpn/faqs/en/index.html>

The International Atomic Energy Agency (IAEA) is posting official updates on the nuclear power plants:

<http://www.iaea.org/newscenter/news/tsunamiupdate01.html>

Mapping resources are available at [http://wiki.crisiscommons.org/wiki/Japan\\_Data\\_Profile](http://wiki.crisiscommons.org/wiki/Japan_Data_Profile).

The Government of Japan's Emergency Management agencies are leading the response through the Emergency Response Team, headed by Prime Minister Naoto Kan.

Information from the Government of Japan, including situation reports can be found at <http://www.kantei.go.jp>.

The Ministry of Foreign Affairs is coordinating all offers of assistance. The Government has restricted space capacity to store aid materials and limited transportation means to deliver assistance to the affected areas.

Therefore, any assistance provided must also be delivered by the donating organisation to the affected areas. The Government welcomes financial donations and asks Member States to donate through the Japanese Red Cross.

The UNDAC Team, based at JICA Tokyo International Centre is supporting the Government with information management and supporting the International USAR teams.

Regular updates on USAR teams are posted on the Virtual OSOCC.

MapAction is supporting the UNDAC team with mapping.

Thank you,

Office for the Coordination of Humanitarian Affairs (OCHA) - Pacific

United Nations

Tel: +679-3316760

Fax: +679-3309762

Level 5, Kadavu House, 414 Victoria Parade, Suva, Fiji

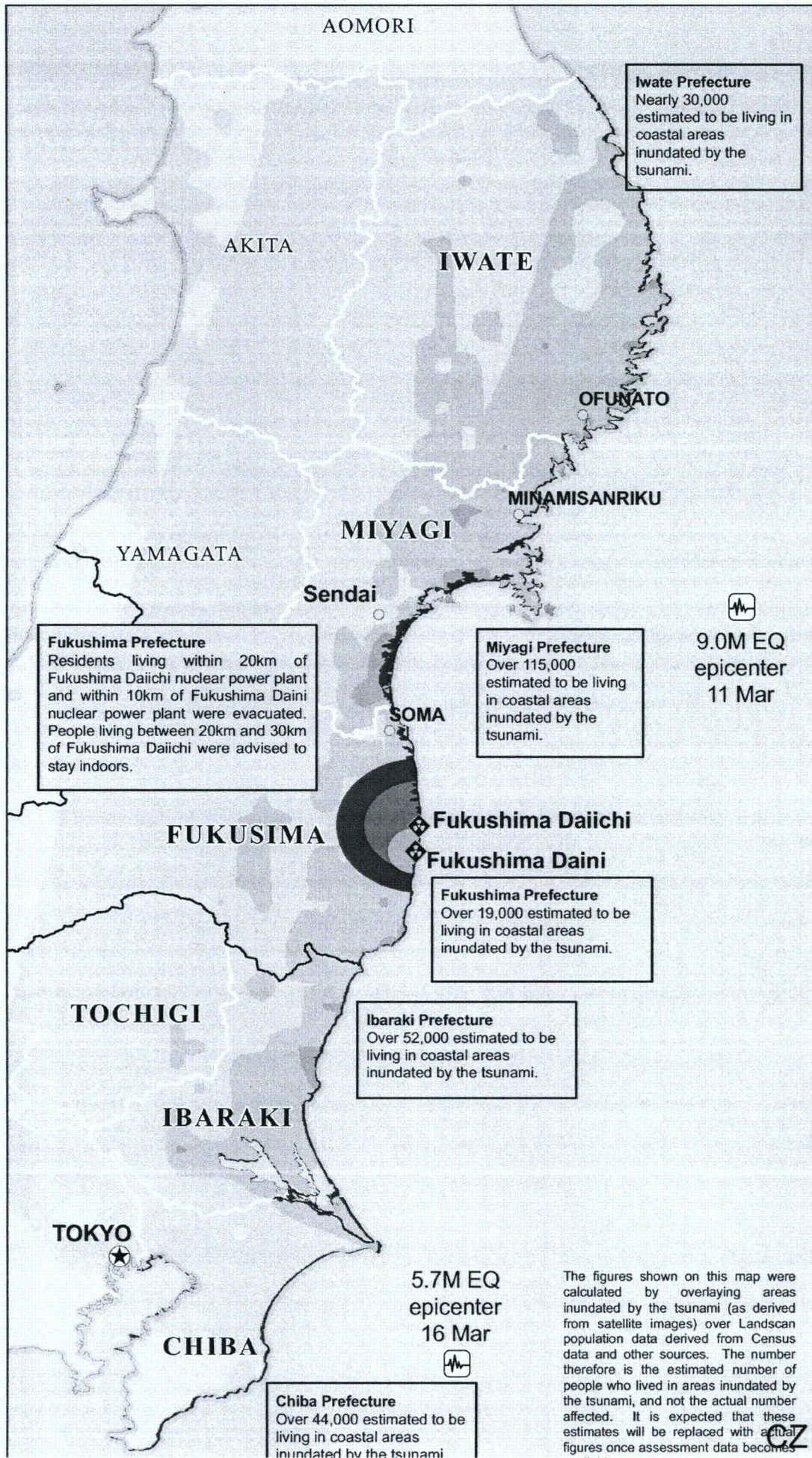
Visit the Pacific Humanitarian Team website at <http://phtpacific.org>

You have been sent this email because you are on the mailing list of OCHA-Pacific.

**If you wish to be removed from this list**, please reply to this message and change the subject to:  
" Please remove me from your mailing list"

-----  
*Disclaimer:*

~~"This email may contain confidential and/or privileged information and is for the sole use of the intended recipient. It may not be disclosed to or used by anyone other than the addressee. If you are not the intended recipient (or have received this email in error) please notify the sender by return email and delete this email and all attachments from your system."~~



**Iwate Prefecture**  
Nearly 30,000 estimated to be living in coastal areas inundated by the tsunami.

**Fukushima Prefecture**  
Residents living within 20km of Fukushima Daiichi nuclear power plant and within 10km of Fukushima Daini nuclear power plant were evacuated. People living between 20km and 30km of Fukushima Daiichi were advised to stay indoors.

**Miyagi Prefecture**  
Over 115,000 estimated to be living in coastal areas inundated by the tsunami.

**Fukushima Prefecture**  
Over 19,000 estimated to be living in coastal areas inundated by the tsunami.

**Ibaraki Prefecture**  
Over 52,000 estimated to be living in coastal areas inundated by the tsunami.

**Chiba Prefecture**  
Over 44,000 estimated to be living in coastal areas inundated by the tsunami.

**Legend**

- Nuclear PowerPlants
- Earthquake
- Areas Inundated by Tsunami
- 10k from F. Daini
- 20k from F. Daiichi
- 30k from F. Daiichi
- Earthquake Intensity Zones**
- Strong shaking
- Very strong shaking
- Severe shaking

**Map Doc Name:**  
JPN\_sitmap\_110316

**Creation Date:** 16 March 2011  
**Projection/Datum:** Lat/Lon WGS84  
**Web Resources:**  
<http://ochaonline.un.org/roap>

0 50 100  
Kilometers

**Map data source(s):**  
UN Cartographic Section, Global Discovery, Dartmouth Flood Observatory, Landsat-Oak Ridge National Laboratory, USGS, PDC

**Disclaimers:**  
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.



5.7M EQ  
epicenter  
16 Mar

9.0M EQ  
epicenter  
11 Mar

The figures shown on this map were calculated by overlaying areas inundated by the tsunami (as derived from satellite images) over Landsat population data derived from Census data and other sources. The number therefore is the estimated number of people who lived in areas inundated by the tsunami, and not the actual number affected. It is expected that these estimates will be replaced with actual figures once assessment data becomes

*This report is produced by OCHA. It was issued by the Regional Office in Asia Pacific with input from the UNDAC team in Tokyo. It covers the period from 15-16 March. The next report will be issued on the 17 March.*

### I. HIGHLIGHTS/KEY PRIORITIES

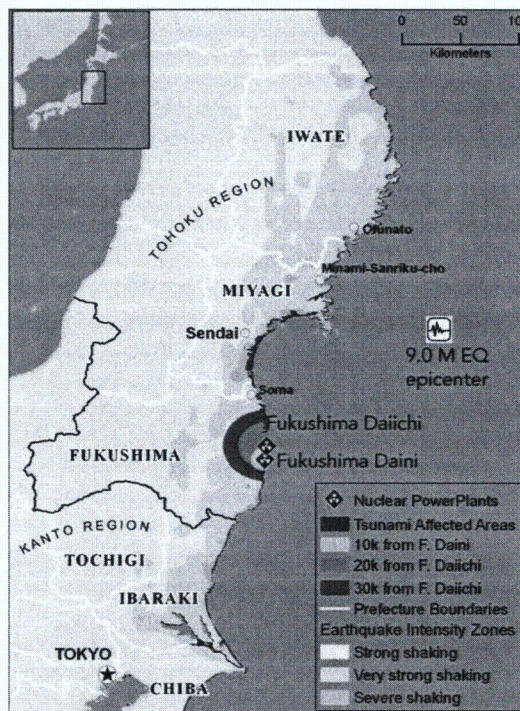
- Snow and freezing temperatures hit the most affected areas
- Food, water and fuel shortages are the main concerns
- The Government orders 600 temporary shelters to be built within two weeks
- Fukushima Nuclear Power Plant crisis is still not under control with a fourth explosion

### II. Situation Overview

The people living in the earthquake and tsunami affected areas along the North East of Japan are now faced with another element to this emergency: snow, rain and extraordinary cold weather. Thousands of households have been without electricity since 11 March when a 9.0 earthquake triggered a powerful tsunami. Concerns are for those who still have not been reached by rescue workers as well as half a million people now living in evacuation centres. Many do not have protective clothing or blankets and heating is insufficient. The cold weather is expected to last until the end of the week.

The snow is also complicating the ongoing emergency relief operation which is already challenged by continued aftershocks. To date, 290 aftershocks have been recorded. Emergency teams have still not been able to reach all the affected areas due to logistical challenges. The Government is still trying to get all the 100,000 troops it has mobilized into the affected areas. Currently there are 80,000 troops on the ground along with police, fire service and the Japanese coast guard.

The Government has confirmed that 3,676 people have died, 2,043 people are injured and 7,845 people remain missing. National media is reporting that more than 15,000 people are unaccounted for in the affected areas. Almost half a million people are now in evacuation centres as a result of the earthquake/tsunami emergency. This includes the 210,000 that have been evacuated from a 20km radius around the Fukushima Daiichi Nuclear power plant.



| Prefecture   | Total Population  | Rescued*     | Missing      | Evacuated      | Dead         | Totally Damaged | Partially Damaged |
|--------------|-------------------|--------------|--------------|----------------|--------------|-----------------|-------------------|
| Miyagi       | 2,347,300         | 5,776        | 2,011        | 292,408        | 1,816        | 348             | 642               |
| Iwate        | 1,327,869         | 810          | 3,318        | 46,405         | 1,296        | 76              | 160               |
| Fukushima    | 2,025,461         | 665          | 2,507        | 131,665        | 509          | 2,413           | 8,099             |
| Ibaraki      | 2,967,665         | 5            | 1            | 12,347         | 19           | 197             | 31,838            |
| Chiba        | 6,217,119         | 4            | 7            |                | 16           | 346             | 3,128             |
| Tochigi      | 2,007,014         |              |              | 9,530          | 4            | 37              | 18,198            |
| <b>TOTAL</b> | <b>16,892,428</b> | <b>7,260</b> | <b>7,844</b> | <b>492,355</b> | <b>3,660</b> | <b>3,417</b>    | <b>62,065</b>     |

\*Source: Emergency Disaster Response Headquarters, the Office of the Prime Minister, 16 March

#### Nuclear Power Plant

Another fire broke out in one of the reactors at the Fukushima Daiichi Nuclear Power Plant this morning, forcing the withdrawal of all workers at the plant and suspending work due to a rise in radiation levels.

Officials said radiation levels in Tokyo were higher than normal but not at levels dangerous to humans. This is the fourth explosion at the earthquake damaged plant since Saturday. A helicopter has been dumping sea water on the facility in an effort to cool it down. In a rare appearance according to Japanese media, Emperor Akihito has made a public statement that he is deeply worried about the crisis his country is facing. The Ministry of Education has released results of all radiation measurements per prefecture on <http://eq.sakura.ne.jp>.

At the request of the Japanese Government, the US Military Nuclear Regulatory Commission has sent another team (nine experts) to Tokyo to provide assistance. The Australians are also providing expert assistance. The Republic of Korea plans to transfer its reserve of boron to stabilise the quake-damaged nuclear reactors. The material is vital for stopping fission nuclear reactions. Japan's stockpile has largely been used up at the Fukushima nuclear power plant.

### III. Government Response

The Government says the immediate needs are blankets, mattresses, latrines, water and fuel.

**Shelter:** More than 430,000 people have evacuated their homes and are currently living in temporary shelters across seven prefectures. Public buildings such as schools, sports centres and community centres are being used as temporary shelters. The Ministry of Land, Infrastructure, Transport and Tourism has ordered the construction of 600 temporary shelters to be built within two weeks. An additional 4,200 shelters will be constructed in four weeks and 30,000 shelters in two months. A Ministry official is visiting the affected areas to secure land for these shelters in Iwate, Miyagi and Fukushima.

**Food:** According to the Emergency Disaster Response Headquarters in the Office of the Prime Minister, 483,550 (nearly 500,000) meals have been delivered to the affected areas.

| Items           | Arrived | In transit |
|-----------------|---------|------------|
| Bread           | 395,550 | 914,900    |
| Instant noodles | 63,200  | 179,800    |
| Rice balls      | 14,800  | 452,146    |
| Rice balls      | 10,000  | 585,209    |

*Source: Emergency Disaster Response Headquarters, the Office of the Prime Minister, 15 March 2011, 17:00*

The Ministry of Agriculture, Forestry and Fisheries of Japan (MAFF) is coordinating with the private sector to mobilise food and water rations. MAFF has also requested franchised supermarkets to continue to operate their businesses in the affected areas in order to ensure access to essential supplies. In addition, the Ministry announced that the Government will issue an emergency transportation pass for vehicles transporting food and livelihood supplies, including fuel to the affected areas. MAFF is coordinating with organisations under its jurisdiction, such as the National Federation of Fisheries Cooperative Associations, to share its reserved fuel and stockpiles of food rations with hospitals.

Meanwhile, MAFF has requested the private sector for increased production of food products, such as rice balls, water bottles, bread, instant noodle, formula milk, snacks, instant food and rice pack. Twenty-two companies have offered in-kind contributions, including 2.3 million meals and 300,000 bottles of water. Emergency food supply to hospitals in the affected areas has been arranged by the Ministry of Health, Labour and Welfare (MHLW).

| Items     | Arrived or in transit |                   | On standby     |             |                |
|-----------|-----------------------|-------------------|----------------|-------------|----------------|
|           | Food (meal)           | Formula milk (kg) | Water (bottle) | Food (meal) | Water (bottle) |
| Aomori    | 5,000                 |                   |                |             |                |
| Iwate     | 256,000               |                   | 50,000         | 272,000     | 50,000         |
| Miyagi    | 822,000               | 7,000             | 550,000        | 291,000     | 300,000        |
| Yamagata  | 2,000                 |                   |                |             |                |
| Fukushima | 150,000               |                   | 101,000        | 633,000     | 633,000        |
| Ibaraki   |                       |                   |                | 89,000      | 91,000         |

*Source: 15 March 09:00 AM, Ministry of Agriculture, Forestry and Fisheries of Japan*

**NFIs:** Local authorities have networks of inter-prefecture cooperation agreements for emergency situations so that non-affected local authorities can release their emergency stockpiles for the response. The media has called on individual donors to send goods and food through the local authorities. In order to increase the



supply of fuel in the market, the Ministry of Economy, Trade and Industry (METI) announced that it will modify the amount of reservation from 70 days to 67 days, which is equal to releasing 1,260,000 kilolitres of petroleum.

| Items        | Arrived | In Transit |
|--------------|---------|------------|
| Blanket      | 97,000  | 306,795    |
| Diaper       | 10,000  | 197,000    |
| Fuel (litre) | 760,000 | 160,000    |

METI also requested credit card companies to relax the withdrawal limit so that the affected population can procure basic livelihood items. The Financial Services Agency has also requested banking institutions relax the requirements for money withdrawal in the affected areas.

Source: Emergency Disaster Response Headquarters, the Office of the Prime Minister, 15 March<sup>1</sup>

**Water, Sanitation and Hygiene:** According to the Ministry of Health, Labour and Welfare (MHLW), 1.6 million households are still without water in 11 prefectures. A total of 320,000 households in Fukushima, 290,000 households in Miyagi, 110,000 in Iwate, and 670,000 households in Ibaraki do not have water. The actual number of households without water may be higher as some areas have not been reached.

MHLW has been coordinating with 245 water supply companies to secure emergency water supply. The Ministry has arranged to send 314 water supply vehicles to the most affected areas including Miyagi (130 vehicles), Fukushima (89 vehicles) and Iwate (51 vehicles). Bottled water was distributed through the local authorities as well. Mobile latrines have been sent to Miyagi.

**Health:** More than 100 Disaster Medical Assistance Teams (DMAT) are in Iwate, Miyagi and Fukushima. Miyagi Prefecture and Sendai City have also requested the dispatch of psychosocial care teams from non-affected medical institutes and prefectures. Two teams will be deployed to Miyagi. MHLW has also requested other local authorities to send child welfare workers to evacuation centres and child counselling centres.

The Japanese Red Cross Society says it currently has 85 medical teams operating out of hospitals and mobile clinics treating people in the disaster-affected areas. Each team includes a trained psychosocial nurse. The Japanese Red Cross has 2,400 trained psychosocial nurses and an eight-member specialist psychosocial team.

**Community Services:** Efforts to find missing family members continue on many fronts. The National Police Agency has established special call centres, through which guidance and support are provided to find missing family members. The Nippon Telephone and Telegraph (NTT) company has started an emergency message service where people can dial and leave messages.

MHLW has requested social welfare facilities in the affected region to ensure particular support to those requiring special care, such as children, elderly and the handicapped. The need for close coordination with volunteers and related organizations has been stressed.

**Education:** Schools in the northern prefectures are currently serving as temporary shelters, hosting populations who have been evacuated from their homes. The Japanese academic year begins in April. Many universities and secondary schools have been compelled to cancel or reschedule entry examinations. The Ministry of Education, Culture, Sports, Science and Technology announced that 97 universities have been affected nation-wide.

### III. International Assistance

The Government of Japan continues to receive offers of assistance from countries around the world. It has now received 113 offers of assistance and it has accepted assistance from 14 countries. There are now 689 International Search and Rescue specialists currently deployed with 32 search dogs. Three teams (Germany, Switzerland and International Rescue Corps) are withdrawing. Some teams are still to arrive from Russia and Indonesia. Search and Rescue teams say conditions are becoming increasingly difficult due to the weather conditions and a lack of supplies including fuel and vehicles. A team working in Ofunato in Iwate Prefecture have confirmed that the damage to buildings and infrastructure are as a result of the tsunami rather than the earthquake. They report that hundreds of homes have been swept off their foundations and relocated hundreds of metres in different directions. The team is also monitoring radiation levels to ensure their safety. Rescue teams have described it as the biggest job they have ever experienced.

<sup>1</sup> <http://www.kantei.go.jp/jp/kikikanri/jisin/20110311miyagi/201103160700.pdf>.

Some 13 Non-Governmental Organisations are providing assistance in the tsunami and earthquake affected areas, working through local partners. UNDAC is developing a basic 3W to better understand where assistance is being delivered and who is operating where.

Adventist Development and Relief Agency Japan (ADRA) is providing assistance at one of the evacuation centres in Sendai and is also preparing to provide 1,000 evacuees with shelter, food, non-food items and transportation.

IOM is helping to provide vital information to disaster-affected migrants in Japan who do not speak Japanese. Information is being disseminated through public and commercial radio on where to access shelter, food and medical assistance.

#### IV. Coordination

The Government of Japan's Emergency Management agencies are leading the response through the Emergency Response Team, headed by Prime Minister Naoto Kan. Information from the Government of Japan, including situation reports can be found at <http://www.kantei.go.jp>.

The Ministry of Foreign Affairs is coordinating all offers of assistance. The Government has restricted space capacity to store aid materials and limited transportation means to deliver assistance to the affected areas. Therefore, any assistance provided must also be delivered by the donating organisation to the affected areas. The Government welcomes financial donations and asks Member States to donate through the Japanese Red Cross.

The UNDAC Team, based at JICA Tokyo International Centre is supporting the Government with information management and supporting the International USAR teams. Regular updates on USAR teams are posted on the Virtual OSOCC. MapAction is supporting the UNDAC team with mapping.

The International Atomic Energy Agency (IAEA) is posting official updates on the nuclear power plants: <http://www.iaea.org/newscenter/news/tsunamiupdate01.html>. The World Health Organisation has information on its website regarding radiation-related health risks: <http://www.who.int/hac/crises/jpn/faqs/en/index.html>

Mapping resources are available at [http://wiki.crisiscommons.org/wiki/Japan\\_Data\\_Profile](http://wiki.crisiscommons.org/wiki/Japan_Data_Profile).

#### V. Contact

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To be added or deleted from this sit rep mailing list, please e-mail: [ochareporting@un.org](mailto:ochareporting@un.org)

---

**From:** LIA01 Hoc  
**Sent:** Wednesday, March 16, 2011 6:31 PM  
**To:** RMTPACTSU\_ELNRC; LIA11 Hoc; LIA07 Hoc; LIA02 Hoc  
**Subject:** RE: NRC Management Directive 10.131  
**Attachments:** md10.131.pdf

**Categories:** FOIA, Red Category

Attached is a pdf of MD 10.131, Protection of NRC Employees Against Ionizing Radiation

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Wednesday, March 16, 2011 6:02 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc  
**Subject:** FW: NRC Management Directive 10.131

Please provide a copy of MD 10.131

---

**From:** Cohen, Harold(GC/DCHA) [mailto:hcohen@usaid.gov]  
**Sent:** Wednesday, March 16, 2011 6:01 PM  
**To:** RMTPACTSU\_ELNRC  
**Cc:** RMTPACTSU\_HHS  
**Subject:** NRC Management Directive 10.131

Jason:

Can you help track down the latest version of the above-referenced NRC Management Direction. This is the standard referenced for NRC personnel in the field.

Thanks,

Hal

Harold L. Cohen  
Deputy Assistant General Counsel  
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*U.S. NUCLEAR REGULATORY COMMISSION*

***DIRECTIVE TRANSMITTAL***

TN: DT-03-01

- To:** NRC Management Directives Custodians
- Subject:** Transmittal of Directive 10.131, "Protection of NRC Employees Against Ionizing Radiation"
- Purpose:** Directive and Handbook 10.131 are being reissued to implement the following changes—
- The policy statement has been revised to include guidance on the use of potassium iodide (KI) by NRC employees during incidents involving radiological releases.
  - The requirement for a periodic peer review of radiation safety program procedures was replaced with a new requirement for offices to conduct an annual internal audit.
  - Provisions were added to distribute the employee exposure database and establish local databases in offices with a radiation safety officer (RSO).
  - The NRR RSO shall be notified of any packages containing radioactive material at NRC Headquarters.

**Office and**

**Division of Origin:** Office of Nuclear Material Safety and Safeguards

**Contact:** Anita Turner, 415-5508

**Date Approved:** July 23, 1996 (Revised: January 17, 2003)

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*OFFICE OF ADMINISTRATION*

CZ 116 of 2042

**Volume:** 10 Personnel Management

**Part:** 5 Benefits, Health Services, and Employee Safety

**Directive:** 10.131 Protection of NRC Employees Against Ionizing Radiation

**Availability:** Rules and Directives Branch  
Office of Administration  
Michael T. Lesar, (301) 415-7163  
Christy Moore, (301) 415-7086

# **Protection of NRC Employees Against Ionizing Radiation**

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**Directive  
10.131**

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# U. S. Nuclear Regulatory Commission

Volume: 10 Personnel Management

Part: 5 Benefits, Health Services, and Employee  
Safety

NMSS

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## **Protection of NRC Employees Against Ionizing Radiation Directive 10.131**

### **Policy**

(10.131-01)

It is the policy of the U.S. Nuclear Regulatory Commission to maintain occupational radiation doses to NRC employees below the limits established in this directive and as low as reasonably achievable (ALARA). NRC shall provide dosimeters to employees in accordance with the provisions of this directive. NRC shall also provide potassium iodide (KI) and other protective equipment (as appropriate) to employees involved in emergency response activities. Otherwise, when an approved radiation safety program exists at a site, NRC shall rely on the program to protect NRC employees assigned to the site (i.e., resident inspectors) or visiting the site. This requirement applies to normal operations and emergency response activities. NRC employees shall comply with the requirements established by the site radiation safety program.

### **Objectives**

(10.131-02)

To establish procedures and standards for protecting NRC employees from ionizing radiation hazards associated with activities conducted by the NRC. These procedures and standards must be—

**Volume 10, Part 5 - Benefits, Health Services, and Employee Safety  
Protection of NRC Employees Against Ionizing Radiation  
Directive 10.131**

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**Objectives**

(10.131-02) (continued)

- Consistent with the regulations of the Occupational Safety and Health Administration (OSHA), Department of Labor, as required by Executive Order 12196, "Occupational Safety and Health Programs for Federal Employees." (021)
- Consistent with the radiation protection guidance to Federal agencies prepared by the former Federal Radiation Council or by the Environmental Protection Agency. (022)
- Consistent with guidance of the Food and Drug Administration (FDA), U.S. Department of Health and Human Services, "Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies," December 2001 (see Exhibit 3; available at <http://www.fda.gov/cder/guidance/4825fml.pdf>). (023)
- Consistent with "Questions and Answers on Guidance: Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies," July 3, 2002 (see Exhibit 4). (024)
- Consistent with the standards adopted by NRC for application to NRC-licensed operations. (025)

**Organizational Responsibilities and  
Delegations of Authority**

(10.131-03)

**Executive Director for Operations (EDO)**

(031)

- Establishes and oversees activities that create and implement standards for protection against radiation for NRC operations. (a)

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**Organizational Responsibilities and  
Delegations of Authority**

(10.131-03) (continued)

**Executive Director for Operations (EDO)**

(031) (continued)

- Delegates to the Director of the Office of Nuclear Material Safety and Safeguards (NMSS) responsibility for establishing radiation protection standards and providing technical oversight of the radiation safety programs for NRC employees. (b)
- Delegates to the Director of the Office of Human Resources (HR) authority to act as the Designated Agency Safety and Health Official (DASHO) for the NRC responsible for the management and administration of nonradiological safety and health programs for NRC employees, and administrative support of the radiation safety program with regard to interaction with OSHA. (c)

**Director, Office of Nuclear  
Regulatory Research (RES)**

(032)

Develops and maintains the employee exposure database system (EEDS) and provides guidance on its use. EEDS is the central database maintained by the EEDS contractor. Local databases will be maintained by each regional office, NMSS, and the Office of Nuclear Reactor Regulation (NRR). Validated quarterly data from the local databases will be transmitted to the EEDS contractor for entry into the central database.

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**Organizational Responsibilities and  
Delegations of Authority**

(10.131-03) (continued)

**Director, Office of Nuclear Material  
Safety and Safeguards (NMSS)**

(033)

- Maintains this management directive and reviews and approves, or disapproves, any proposed routine deviation (other than emergency actions) from the provisions of this directive dealing with radiation safety standards for NRC employees. (a)
- Provides the project officer and other technical support for the contract that provides personnel monitoring equipment for NRC employees. (b)
- Renders interpretations of the provisions of this management directive in consultation with the Office of the General Counsel. (c)
- Ensures that NRC headquarters and regional offices implement and maintain the standards for protection against radiation under the provisions established by this management directive by initiating a peer review of internal audit results each year by all of the NRC radiation safety officers (RSOs). These reviews should include any deviations authorized under item (033)(a) of this directive. (d)
- Provides quality assurance and implementation guidance as necessary to ensure consistency of radiation safety programs. (e)
- Initiates an annual counterparts meeting for all NRC RSOs, providing a written agenda to discuss NRC radiation safety

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**Organizational Responsibilities and  
Delegations of Authority**

(10.131-03) (continued)

**Director, Office of Nuclear Material  
Safety and Safeguards (NMSS)**

(033) (continued)

program matters and to resolve problems. Provides minutes reflecting the results of the meeting to the EDO, program office directors, and regional administrators as an annual report on the NRC radiation safety program. (f)

**Director, Office of Human Resources (HR)**

(034)

- Reviews and approves, or disapproves, any proposed deviation from the nonradiological requirements dealing with employee occupational safety and health. (a)
- Ensures that new employees complete an NRC Form 4, "Lifetime Occupational Exposure History," or an equivalent form, when they enter on duty and forwards this form to RES for entry in the EEDS. (b)
- Ensures that the provisions of this directive are consistent with the safety and health regulations issued by OSHA and acts as the NRC representative with OSHA. (c)
- Establishes and offers training courses to support the training requirements of this directive. (d)
- Maintains records of NRC employees who have successfully completed radiation safety training (including Site Access Training and NMSS Radiation Worker Training) within the last 12 months and provides reports to NRC RSOs upon request. (e)

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**Organizational Responsibilities and  
Delegations of Authority**

(10.131-03) (continued)

**Director, Office of Human Resources (HR)**

(034) (continued)

- Maintains records of NRC employees and provides electronic data files to RES quarterly to update the personnel table in the EEDS. (f)

**Director, Office of Administration (ADM)**

(035)

- Develops procedures for the distribution of personnel radiation monitoring equipment to headquarters employees. (a)
- Executes the contract(s) necessary to provide personnel radiation monitoring services and provides administrative support with regard to contract-related activities for NRC headquarters, regional, and field offices. (b)

**Office Directors and  
Regional Administrators**

(036)

- Ensure that employees under their jurisdiction are informed of the provisions of this management directive and that they comply with these provisions. (a)
- Ensure that any employee under their jurisdiction is notified immediately if the employee has been exposed to any radiation (single or cumulative exposure) that exceeds the limits specified in this management directive (see Table II-1 in the handbook). (b)
- Each regional administrator and the Directors of NRR and NMSS shall appoint an RSO and an alternate RSO, and

**Organizational Responsibilities and Delegations of Authority**

(10.131-03) (continued)

**Office Directors and Regional Administrators**

(036) (continued)

establish a radiation safety program for using dosimeters and maintaining occupational doses below the limits established in this directive and ALARA. All other NRC office directors shall obtain their radiation safety support from the NRR RSO. The minimum qualification for an RSO is a working knowledge of basic health physics and radiological controls gained from 3 to 5 years of training and experience. (c)

- Each regional administrator and the Directors of NRR and NMSS shall ensure that an internal audit of the radiation safety program for the office is conducted annually. Individuals performing the audit will have technical expertise in radiation safety but no direct responsibility for the program. (d)
- Each regional administrator and the Directors of NRR and NMSS shall ensure that a local database is maintained, including loading and validating data as well as transmitting validated data to the central database maintained by the EEDS contractor. (e)
- Decide and act when immediate decisions and actions are required and immediately inform the Director of NMSS of any action that results in an exception to this directive. (f)
- Each regional administrator shall ensure that provisions for personnel radiation monitoring devices are adequate to support regional emergency response duties. (g)
- Each regional administrator shall maintain a supply of potassium iodide (KI) for site teams dispatched during an emergency. (h)

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**Organizational Responsibilities and  
Delegations of Authority**

(10.131-03) (continued)

**Office Directors and  
Regional Administrators**

(036) (continued)

- Establish procedures to ensure the appropriate technical training of employees who may receive occupational exposures to radiation. (i)
- Each regional administrator shall develop and implement a written radiation safety program for possession and use of radioactive materials, and radiation-producing devices, in the regional office. (j)

**Applicability**

(10.131-04)

The policy and guidance in this directive and handbook apply to all NRC employees.

- This management directive applies to occupational exposures received by NRC employees during official duties at any location. However, requirements concerning the control of radioactive material apply to facilities controlled by NRC only. (041)
- This management directive does not apply to non-NRC employees (e.g., contractors), and it does not apply to exposures from background radiation, medical exposures, exposures to individuals administered radioactive materials and released under 10 CFR Part 35, nor exposures from voluntary participation in medical research programs. (042)



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**Directive 10.131**

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**Handbook**

(10.131-05)

Handbook 10.131 contains guidelines, procedures, and standards for protection of NRC employees against ionizing radiation to be applied in conformance with the requirements of this management directive.

**Definitions**

(10.131-06)

The terms used in this directive and handbook are as defined in 10 CFR Part 20, "Standards for Protection Against Radiation."

**References**

(10.131-07)

*Code of Federal Regulations*

"Notices, Instructions, and Reports to Workers: Inspection and Investigations," 10 CFR Part 19.

"Standards for Protection Against Radiation," 10 CFR Part 20.

"Occupational Safety and Health Standards," 29 CFR Part 1910.

"Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters," 29 CFR Part 1960.

Environmental Protection Agency "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," EPA 400-R-92-001, May 1992.

Executive Order 12196, "Occupational Safety and Health Programs for Federal Employees" (45 FR 12769), February 26, 1980.

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**References**

(10.131-07) (continued)

NRC Management Directives—

3.53, "NRC Records Management Program."

10.130, "Safety and Health Program Under the Occupational Safety and Health Act."

NRC Regulatory Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure," June 1999.

NUREG-0910, "NRC Comprehensive Records Disposition Schedule," Revision 3, February 1998.

NUREG/CR-4214, "Health Effects Models for Nuclear Power Plant Accident Consequence Analysis," Revision 1, Part II, Addendum 1, August 1991.

Occupational Safety and Health Act of 1970 (29 U.S.C. 651 et seq.).

Privacy Act of 1974, as amended (5 U.S.C. 552a).

"Radiation Protection Guidance to Federal Agencies for Occupational Exposure; Approval of Environmental Protection Agency Recommendations," Administrative Order (52 FR 2822) January 27, 1987.

# **Protection of NRC Employees Against Ionizing Radiation**

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**Handbook**

**10.131**

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## **Part I General Provisions**

### **Purpose (A)**

The purpose of the guidelines and procedures in this handbook is to control the possession, use, and transfer of sources of radiation by NRC personnel in such a manner that the dose to an individual does not exceed the standards of radiation protection prescribed herein and is maintained as low as reasonably achievable (ALARA). This handbook also provides standards to protect NRC employees from radiation hazards during licensing, inspection, enforcement, and other regulatory activities, including visits to nuclear facilities in other countries.

### **Training (B)**

Each program office and region shall establish provisions for radiation safety training commensurate with the duties of its employees. In general, the training frequency should be at least once every 2 years. Employees requesting power reactor and certain fuel cycle facilities to accept NRC site access training in place of their own training for unescorted access will need training every 12 months. In addition, each office should provide discretionary training to ancillary personnel commensurate with their duties.

### **Responsibilities of the Radiation**

#### **Safety Officers (RSOs) (C)**

RSOs shall—

- Ensure that headquarters or regional office procedures implement the provisions of this directive. (1)

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**Responsibilities of the Radiation**

**Safety Officers (RSOs) (C) (continued)**

- Review radiation exposure information on monitored employees in their headquarters or regional offices for overexposures and anomalies and distribute information to managers, as appropriate, to allow them to maintain the doses to their staff ALARA. The release of employee exposure information must be conducted with due regard for employee rights under the Privacy Act. (2)
- Maintain a local employee exposure database, including loading electronic files, validating records, and transmitting validated records to the central employee exposure database. (3)
- Furnish radiation exposure information, upon request, to office directors or regional administrators who have a need to know. (4)
- Furnish radiation exposure data to current and former employees as required by this management directive. (5)
- Maintain prior dose records in accordance with Part II(B)(1) of this handbook and prepare records for each planned special exposure in accordance with 10 CFR 20.2105(a). (6)
- Ensure that an annual written internal audit of the radiation safety program is conducted. Internal audits shall be performance based and focused on verification that accurate exposure records are being developed and maintained for each NRC employee in the office or region. Each audit shall include an evaluation of radiological risks in the office or region and verification that the program, as implemented, addresses these risks. Peer reviews of written audit results shall be



## **Responsibilities of the Radiation**

### **Safety Officers (RSOs) (C) (continued)**

performed during the annual RSO counterpart meeting. Individuals performing the audit will have technical expertise in radiation safety but no direct responsibility for that program. (7)

- Furnish reports of overexposures to the appropriate office director or regional administrator. (8)
- Participate in the annual RSO counterpart meeting, providing copies of procedures and records, as requested, and performing peer reviews of written and implemented radiation safety programs. (9)
- Determine, in consultation with an employee's immediate supervisor, when it is necessary or desirable to furnish bioassay services to an employee and assist the employee with obtaining bioassay services, as appropriate. (10)
- Determine and assign appropriate radiation dose to employees who have incomplete dose records as a result of loss of or damage to their dosimeters. (11)

### **Responsibilities of Employees (D)**

Employees shall—

- Comply with the standards and procedures established by the NRC that are applicable to their own actions and conduct. (1)
- Make every reasonable effort to maintain the sum of internal and external radiation exposure and the release of radioactive materials in effluents to unrestricted areas ALARA. (2)

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**Responsibilities of Employees (D) (continued)**

- Use safety and personal protective equipment and other devices or means necessary for their protection that the employee is provided or instructed to use by the NRC or the radiation protection staff at the licensed site. (3)
- Use correct, safe practices in all official activities and follow the licensee radiation safety procedures during site visits and inspections. (4)
- Report any observed radiation hazards to a supervisor as soon as reasonably possible. (5)
- Inform their RSO of any occupational exposure history in accordance with this management directive and applicable office procedures. (6)
- Make every effort to exchange dosimeters and report lost or damaged dosimeters in a timely manner. (7)
- If female, at their discretion, voluntarily declare in writing to their immediate supervisor that they are pregnant. Supervisors will inform the RSO of all declared pregnancies. Regulatory Guide 8.13 contains a sample letter for declaring pregnancy<sup>1</sup> and information that can help pregnant employees and others make decisions regarding exposure during pregnancy. These employees should discuss any questions regarding the information contained in Regulatory Guide 8.13 with their RSOs or immediate supervisors. (8)

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<sup>1</sup>This sample letter is designed for use by employees of NRC licensees. It has been revised for use by NRC employees and is attached to this handbook as Exhibit 1.

**Part II  
Permissible Doses, Levels, and  
Concentrations**

**Occupational Dose Limits  
for Adults (A)**

The occupational dose to individual adult employees shall be limited to the following doses:

**Table II-1 Occupational Dose Limits for Adults**

| Dose    | Routine<br>Rem/Year | Planned<br>Special<br>Rem/Year | Planned Special<br>Rem/Lifetime |
|---------|---------------------|--------------------------------|---------------------------------|
| LDE     | 15                  | 15                             | 75                              |
| SDE, WB | 50                  | 50                             | 250                             |
| SDE, ME | 50                  | 50                             | 250                             |
| TEDE    | 5                   | 5                              | 25                              |
| TODE    | 50                  | 50                             | 250                             |

LDE      Lens (eye) dose equivalent measured at a dose depth of 300 mg/cm<sup>2</sup>.

SDE, WB      Shallow dose equivalent to the skin of the whole body measured at a dose depth of 7 mg/cm<sup>2</sup> averaged over 1 cm<sup>2</sup>.

SDE, ME      Shallow dose equivalent to the skin of the maximally exposed extremity measured at a dose depth of 7 mg/cm<sup>2</sup> averaged over 1 cm<sup>2</sup>.

TEDE      Total effective dose equivalent defined as the sum of the deep dose equivalent and the committed effective dose equivalent.

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**Occupational Dose Limits  
for Adults (A) (continued)**

TODE Total organ dose equivalent defined as the sum of the deep dose equivalent and the committed dose equivalent (from internally deposited sources) to the maximally exposed organ other than the lens of the eye.

**Determination of Prior Dose (B)**

Before authorizing official duties likely to cause an employee to receive an occupational dose requiring monitoring pursuant to Part III of this handbook, the responsible headquarters office director or regional administrator shall ensure that—(1)

- The occupational radiation dose received by the employee during the current year has been determined. (a)
- An attempt has been made to determine the occupational dose that the employee has received over his or her lifetime. (b)

The NRC shall maintain records of prior dose for 75 years from the date of the creation of the record (see NUREG-0910, Schedule 2-22.4.a). (2)

Before allowing an individual to participate in a planned special exposure, the responsible region or headquarters program office shall obtain—(3)

- The individual's signed certificate, NRC Form 4, "Lifetime Occupational Exposure History," showing each period the individual was monitored for occupational exposure to radiation and the results of that monitoring. (a)

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**Determination of Prior Dose (B) (continued)**

- A letter authorizing the planned special exposure signed by the individual and the individual's immediate supervisor, with organizational concurrence through the level of office director or regional administrator. (b)

In preparing the NRC Form 4, or a clear and legible record containing all the information required in NRC Form 4, NRC shall make a reasonable effort to obtain reports of the individual's previously accumulated occupational dose or a printout from the Radiation Exposure Information Reporting System (REIRS) database. The NRC's Privacy Act System of Records, NRC-27, "REIRS Files," contains additional information regarding records on individuals that are maintained in the system. For each period for which these reports are obtained, the dose shown in the report must be used in preparing NRC Form 4. The provisions of 10 CFR 20.2104(e) shall be observed if records are unavailable. The NRC shall retain and preserve records used in preparing NRC Form 4 and database records for 75 years from the date of the creation of the record or report (see NUREG-0910, Schedule 2-22.4.a and b). (4)

**Exposure of Individuals to Radioactive  
Materials in the Air (C)**

It is assumed that an individual inhales radioactivity at the airborne concentration in which he or she is present unless respiratory protective equipment is used. To ascertain if the sum of external and internal dose is as low as reasonably achievable (ALARA), concentrations of radioactive materials in the air will be measured to detect and assess airborne radioactivity in restricted areas and, as appropriate, radioactivity in the body, excreted from the body, or any combination thereof will be measured to detect and assess individual intakes of radioactivity by exposed individuals. (1)

To limit concentrations of radioactive materials in the air, process or other engineering controls will be used at NRC facilities, to the

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**Exposure of Individuals to Radioactive  
Materials in the Air (C) (continued)**

extent practicable. When it is impractical to apply engineering controls (e.g., fume hoods) to limit concentrations of radioactive material in the air, other precautionary procedures, such as increased surveillance, limitation of working times, or the use of respiratory protection equipment, will be used to maintain the sum of internal and external exposures ALARA. The use of respiratory protection equipment shall be consistent with the provisions in 10 CFR 20.1703. (2)

**Planned Special Exposures (D)**

The need for a planned special exposure is not anticipated, but, if necessary, an office director or a regional administrator may authorize an adult employee to receive a planned special exposure, provided that the conditions specified in 10 CFR 20.1206 are satisfied.

**Occupational Dose Limits  
for Minors (E)**

No individual under 18 shall receive an annual dose in excess of 10 percent of the limits of exposure to sources of radiation or radioactive material under the control of NRC (see Section (A) of this part for limits). Minors may not participate in planned special exposures.

**Dose Limits for Members  
of the Public (F)**

No member of the public shall receive a dose in excess of 0.1 rem total effective annual dose equivalent from the sum of external and internal exposures from sources of radiation or radioactive

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**Dose Limits for Members  
of the Public (F) (continued)**

material under the control of NRC. This restriction excludes the dose contribution from any disposal of radioactive material into sanitary sewerage pursuant to Part IV of this handbook. Also, a dose from external sources in unrestricted areas must be less than 2 millirem in any one hour.

**Dose to an Embryo or a Fetus (G)**

The dose to the embryo or fetus during the entire pregnancy of a woman who has voluntarily declared in writing to her immediate supervisor that she is pregnant must not exceed 0.5 rem from the sum of exposure to sources external to the mother, intakes of radioactive material deposited in the mother, and intakes of radioactive material deposited in the embryo or fetus. If the dose to the declared pregnant employee has already exceeded 0.45 rem at the time of the declaration, the dose for the remainder of the pregnancy must be limited to 0.05 rem. Every effort should be made to avoid substantial variation above a uniform monthly exposure rate (i.e., about 55 millirem per month). All of the occupational dose limits in Section (A) of this part continue to apply to the declared pregnant employee as long as the limits in this section are not exceeded.

**Compliance With Dose Limits for  
Members of the Public (H)**

NRC offices possessing radioactive material shall measure, as appropriate, radiation levels in unrestricted areas to demonstrate compliance with the dose limits for members of the public mentioned in Section (F) above. Compliance shall be demonstrated using methods consistent with those specified in 10 CFR 20.1302.

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**Furnishing of Bioassay Services (I)**

When the cognizant radiation safety officer, in consultation with an employee's immediate supervisor, determines that bioassay services are necessary or desirable, appropriate bioassay services shall be made available to the employee to aid in determining the extent of the employee's exposure to concentrations of radioactive material. Each office or region shall make provisions for obtaining bioassay services if the need arises.



## **Part III Precautionary Procedures**

### **Surveys (A)**

Surveys shall be made at NRC facilities as necessary to comply with the provisions of this handbook and to determine the extent of any radiation hazard that may be present. (1)

Instruments and equipment used for quantitative radiation measurements by NRC employees and/or at NRC facilities (e.g., dose rate measurements and effluent monitoring) shall be calibrated periodically for the radiation measured. It is recommended that instruments be calibrated at least annually. (2)

### **Personnel Monitoring (B)**

NRC licensees are legally responsible for limiting workers' exposures to radioactive material in their possession in accordance with 10 CFR Part 20. This responsibility includes visitors and other individuals, as well as the licensee's employees. (1)

When NRC issues a dosimeter, it will be the primary dosimeter of record unless there is reason to believe that another dose measurement or estimate is more accurate; in which case, the more accurate dose shall be recorded. NRC office directors and regional administrators shall ensure that personnel monitoring equipment, supplied by NRC or the licensee, is issued to NRC employees and used during visits to facilities at which radioactive material is stored or used if any of the following criteria are met: (2)

- An employee is likely to exceed 10 percent of any of the limits listed in Part II (A) of this handbook. (a)

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**Personnel Monitoring (B) (continued)**

- Any employee under 18 years of age is likely to exceed the conditions listed in 10 CFR 20.1502 for minors. (b)
- A declared pregnant employee is likely to receive during the entire pregnancy, from radiation sources external to the body, a deep dose equivalent in excess of 0.1 rem.<sup>1</sup> (c)
- An employee is entering a high or a very high radiation area. (d)

All NRC personnel dosimeters used to demonstrate compliance with the dose limits in this handbook shall comply with the provisions in 10 CFR 20.1501, including the use of an accredited dosimetry processor. Supplemental dosimeters, such as pocket ionization chambers and electronic dosimeters, may be used also. (3)

If monitoring is required and licensee monitoring programs are used instead of NRC monitoring programs, the monitoring results should be obtained from the licensee using NRC Form 525, "Request for and Authorization of Release of Dosimetry Records" (see Exhibit 2 of this handbook), (or an equivalent procedure), and provided to the appropriate RSO for review. If the results are acceptable, the RSO shall enter them into the local employee exposure database. (4)

The NRC is not required to make independent radiation measurements or duplicate radiation safety programs at facilities that are not under its direct control. NRC employees who visit facilities at which they may be exposed to radioactive materials may accept the measurements made by the facility personnel and rely on the radiation safety programs established at the facility. (5)

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<sup>1</sup>All of the occupational doses in Part II(A) of this handbook continue to apply to the declared pregnant employee as long as the embryo/fetus dose limit in Part II(G) is not exceeded.

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**Caution Signs, Labels, Signals,  
and Controls (C)**

Unless a deviation is authorized by the Director of the Office of Nuclear Material Safety and Safeguards, caution signs, labels, signals, and controls will be used as specified in 10 CFR 20.1901, 20.1902, 20.1903, 20.1904, and 20.1905. (1)

A current copy of this handbook and any operating procedures applicable to work involving radiation or radioactive material will be conspicuously posted in appropriate locations of NRC facilities to ensure that employees who have the potential to receive an occupational exposure from NRC-controlled radiation sources shall observe these documents. If posting these documents is not practicable, a notice shall be posted that describes the documents and explains where they may be examined. The office director or a designated representative shall keep these documents available for examination upon request. (2)

**Picking Up, Receiving, and  
Opening Packages (D)**

Each region shall maintain and follow procedures consistent with the requirements specified in 10 CFR 20.1906 for safely picking up, receiving, and opening packages in which radioactive material is contained. Due consideration shall be given to special instructions for the type of package being opened. The ADM mail room staff shall notify the NRR RSO if they receive any packages that are labeled indicating that they contain radioactive material. The NRR RSO shall assist with the proper handling of the package.

**Instructions to Employees (E)**

All employees who have the potential for receiving an occupational dose shall be advised and instructed—(1)

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**Instructions to Employees (E) (continued)**

- About the storage, transfer, and use of radioactive materials and about radiation levels associated with their assigned duties. (a)
- About the health protection problems associated with exposure to radioactive materials and radiation, precautions and procedures to minimize exposure, and the purposes and functions of protective devices employed. (b)
- To observe to the extent within the worker's control the applicable provisions of this handbook for the protection of personnel from exposure to radiation or radioactive materials associated with their assigned duties. (c)
- About their responsibility to promptly report any condition that may lead to or cause a violation of the provisions of this handbook or unnecessary exposure to radiation or to radioactive material. (d)
- About the appropriate response to warnings made in the event of any unusual occurrence or malfunction that may involve exposure to radiation or radioactive material. (e)
- About the results of monitoring for exposure to radiation or radioactive material on an annual basis. (f)

The extent of these instructions will be commensurate with the potential radiological health risk. (2)

Each individual shall receive appropriate training before being issued a dosimeter, unless the individual will be escorted by someone with equivalent training. (3)

**Storage and Control of Radioactive  
Materials in Unrestricted Areas (F)**

Radioactive materials stored by NRC staff in an unrestricted area shall be secured to prevent unauthorized removal from the place of storage. (1)

NRC staff shall control and maintain constant surveillance of radioactive material that is in an unrestricted area and not in storage. (2)

## **Part IV Waste Disposal**

### **General Requirement (A)**

No NRC facility shall dispose of radioactive material except under any of the following conditions:

- By transfer to an authorized recipient as defined by 10 CFR 20.2001(a)(1). (1)
- As provided in Sections (B) and (C) of this part or by release in effluents within the limits in Part II(A) of this handbook. (2)
- As otherwise provided in NRC regulations for licensees. (3)

### **Disposal of Radioactive Material by Release Into Sanitary Sewerage Systems (B)**

Radioactive material may be discharged into a sanitary sewer system if the conditions specified in 10 CFR 20.2003 are satisfied. Care should be taken to comply with local and State regulatory requirements concerning the nonradioactive properties of materials discharged into a sanitary sewer system.

### **Disposal of Specific Wastes (C)**

NRC facilities may dispose of wastes specified in 10 CFR 20.2005 as if they are not radioactive.

### **Mixed Waste (D)**

The generation of mixed radiological and hazardous waste at NRC facilities will be avoided if at all possible. Any mixed waste generated will be managed and disposed of in accordance with all applicable Federal and State regulations.

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**Records (E)**

Records of any waste disposal made pursuant to this part will be maintained in accordance with Part V of this handbook.

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**Part V  
Records, Reports, and Notifications**

**Records of Surveys, Radiation  
Monitoring, and Disposal (A)**

**General Provisions (1)**

The records required by this handbook will contain the units curie, rad, and rem, including multiples and subdivisions, and the units will be clearly indicated. Units of roentgen and disintegrations per minute (dpm) are acceptable on records of radiation and contamination surveys. The quantities in the records also will be clearly indicated as the total effective dose equivalent, the shallow dose equivalent, the deep dose equivalent, the eye dose equivalent, and the committed effective dose equivalent. The shallow dose equivalent pertains to both the maximum extremity and the skin of the whole body. (a)

The retention requirements of this directive and handbook are not intended to limit or reduce any other NRC record retention requirements. (b)

**Records of the NRC Radiation Protection Program (2)**

Historical records of the provisions specified in this directive and handbook, including any interpretations or deviations, shall be maintained by the Office of Nuclear Material Safety and Safeguards (NMSS) for 75 years in accordance with NUREG-0910, Schedule 1-2.2.b. (a)

Audits and other reviews of program content and implementation will be maintained in accordance with standard NRC record retention requirements. (b)



## **Records of Surveys, Radiation**

### **Monitoring, and Disposal (A) (continued)**

#### **Records of Surveys (3)**

Records showing the results of surveys and calibrations required by Part III(A) of this handbook will be retained for 75 years in accordance with the National Archives and Records Administration (NARA) approved records schedule N1-431-00-13, Item 16. (a)

The following records, when applicable to an individual, will be retained for 75 years from the date of the creation of the record (see NUREG-0910, Schedule 2-22.4.a). (b)

- Records of the results of surveys to determine the dose from external sources and used in the absence of or in combination with individual monitoring data in the assessment of individual dose equivalents. (i)
- Records of the results of measurements and calculations used to determine individual intakes of radioactive material and used in the assessment of internal dose. (ii)
- Records of the results of measurements and calculations used to evaluate the release of radioactive effluents to the environment. These records will be retained for 75 years in accordance with the NARA approved records schedule N1-431-00-13, Item 16. (iii)
- Records of pregnant employee declarations. (iv)
- Records of abnormal dose investigation results. (v)
- Records of respiratory protection medical examinations. (vi)

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**Records of Surveys, Radiation  
Monitoring, and Disposal (A) (continued)**

**Records of Prior Dose (4)**

Records of prior dose will be prepared pursuant to Part II(B) of this handbook. (a)

Records of prior dose will be maintained for 75 years from the date of the creation of the record (see NUREG-0910, Schedule 2-22.4.a). (b)

**Records of Planned Special Exposures (5)**

For each planned special exposure of an NRC employee, the radiation safety officer for that employee shall ensure that the records specified in 10 CFR 20.2105(a) are prepared. (a)

Records of planned special exposures will be maintained for 75 years from the date of the creation of the record (see NUREG-0910, Schedule 2-22.4.a). (b)

**Records of Individual Monitoring Results (6)**

NRC shall maintain records of doses received by NRC employees for whom monitoring was required and records of doses received during planned special exposures, accidents, and emergency conditions. These records will include the same information required by 10 CFR 20.2106(a). These records will be stored under the NRC's Privacy Act System of Records (NRC-27, "Radiation Exposure Information Reporting System [REIRS] Files"). NRC shall ensure that personnel data, such as social security numbers of individuals, provided to contractors for dosimetry processing are protected from public disclosure pursuant to the Privacy Act of 1974, as amended. (a)

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**Records of Surveys, Radiation**

**Monitoring, and Disposal (A) (continued)**

**Records of Individual Monitoring Results (6) (continued)**

Entries on the records specified in paragraph (a) above will cover periods not exceeding 1 calendar year. (b)

The records required by this section will be in a format similar to that of NRC Form 5, "Occupational Exposure Record for a Monitoring Period." (c)

The records required under this section shall be protected from public disclosure pursuant to the Privacy Act of 1974, as amended. (d)

NRC shall maintain records of dose to an embryo or a fetus with the records of dose to the declared pregnant woman. The declaration of pregnancy also will be kept on file but may be maintained separately from the dose records. Both records will be stored under the NRC's Privacy Act System of Records, NRC-27, "REIRS Files." (e)

Records of individual monitoring results will be maintained for 75 years from the date of the creation of the record (see NUREG-0910, Schedule 2-22.4.a). (f)

Dosimeter and film badge processing reports will be maintained for 75 years from the date of the report (see NUREG-0910, Schedule 2-22.4.a). (g)

**Records of Dose to Individual Members of the Public (7)**

Each headquarters and regional office possessing radioactive material, other than quantities that are exempt from NRC regulations, shall maintain records sufficient to demonstrate compliance with the dose limit for individual members of the public. (a)

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**Records of Surveys, Radiation**

**Monitoring, and Disposal (A) (continued)**

**Records of Dose to Individual Members of the Public (7)  
(continued)**

The records required by paragraph (a) above will be retained for 75 years in accordance with NARA approved records schedule N1-431-00-13, Item 16. (b)

**Records of Waste Disposal (8)**

Records of waste disposal made pursuant to Part IV of this handbook will be retained for 75 years in accordance with NARA approved records schedule N1-431-00-13, Item 16.

**Record Requirements (9)**

Each record required by this part shall be accumulated in locations formally designated as "official file stations" and retained in accordance with the applicable NARA approved records disposition schedules contained in NUREG-0910, "NRC Comprehensive Records Disposition Schedule." The file custodian of these records shall maintain an updated "Files Maintenance and Disposition Plan" (NRC Form 306, which is available on InForms) for each respective official file station in accordance with Management Directive 3.53, "NRC Records Management Program," that includes the records schedule number and approved disposition for each record series maintained. These records are to be transferred to the Office of the Chief Information Officer (OCIO) for storage when they become inactive or when they are 2 to 3 years old, whichever comes first. Any changes in the media used to store these records shall be coordinated with the NRC Records Officer (i.e., Chief of the Records Management Branch, OCIO) to ensure that the records are properly scheduled and that the records are retained accordingly.

**Reports of Theft or Loss of  
Radioactive Material (B)**

Headquarters and regional offices shall report by telephone to the NRC Operations Center under either of the following circumstances: (1)

- Immediately after discovering that any radioactive material in a quantity greater than 1000 times the quantity specified in 10 CFR 20.1001-2402, Appendix C, is lost, stolen, or missing under circumstances in which an exposure could result to persons in unrestricted areas. (a)
- Within 30 days after discovering that any lost, stolen, or missing radioactive material in a quantity greater than 10 times the quantity specified in 10 CFR 20.1001-2402, Appendix C, is still missing. (b)

Within 30 days of reporting the lost, stolen, or missing radioactive material, the reporting office shall submit to the Director of NMSS and the appropriate Deputy Executive Director for Operations a written report containing the following information: (2)

- A description of the radioactive material involved, including kind, quantity, chemical form, and physical form. (a)
- A description of the circumstances under which the loss or theft occurred. (b)
- A statement of disposition or probable disposition of the radioactive material involved. (c)
- Radiation exposures to individuals, circumstances under which the exposures occurred, and the possible total effective dose equivalent (TEDE) to persons in unrestricted areas. (d)

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**Reports of Theft or Loss of  
Radioactive Material (B) (continued)**

- Actions that were taken or will be taken to recover the material. (e)
- Procedures or measures that were adopted or will be adopted to prevent a recurrence of the loss or theft of radioactive material. (f)

Subsequent to filing the written report, the reporting office also shall report to the Director of NMSS and the appropriate Deputy Executive Director for Operations any substantive additional information on the loss or theft that becomes available within 30 days of learning this information. (3)

**Notification of Incidents (C)**

**Immediate Notification (1)**

Headquarters and regional offices shall immediately notify the NRC Operations Center in person or by telephone after discovering any incident involving radioactive material under NRC control that may have caused—

- An individual to receive any of the following: (a)
  - A TEDE of 25 rem or more (i)
  - An eye dose equivalent of 75 rem or more (ii)
  - A shallow dose equivalent to the skin or extremities of 250 rads or more (iii)
- The release of radioactive material inside or outside a restricted area that could cause an individual present for 24 hours to receive an intake five times the annual limit on

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**Notification of Incidents (C) (continued)**

**Immediate Notification (1) (continued)**

intake. **Note:** The provisions of this paragraph do not apply to locations in which personnel are not normally stationed during routine operations, such as hotcells or process enclosures. (b)

**Twenty-four Hour Notification (2)**

Headquarters and regional offices shall notify the NRC Operations Center in person or by telephone within 24 hours of discovering any of the following events involving radioactive material under NRC control:

- An event that may have caused an individual to receive any of the following in a period of 24 hours: (a)
  - A TEDE of 5 rem or more (i)
  - An eye dose equivalent of 15 rem or more (ii)
  - A shallow dose equivalent to the skin or extremities of 50 rem or more (iii)
- An event that may have caused a release of radioactive material inside or outside a restricted area that could cause an individual present for 24 hours to receive an intake in excess of one annual limit on intake (ALI). **Note:** The provisions of this paragraph do not apply to locations in which personnel are not normally stationed during routine operations, such as hotcells or process enclosures. (b)
- An unplanned contamination event that requires access to the contaminated area, by workers or the public, to be restricted for more than 24 hours by imposing additional radiological controls or prohibiting entry into the area. (c)

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**Notification of Incidents (C) (continued)**

**Twenty-four Hour Notification (2) (continued)**

- An event that requires unplanned medical treatment at a medical facility of an individual with spreadable radioactive contamination on the individual's clothing or body. (d)
- An unplanned fire or explosion that damages radioactive material, or any device, container, or equipment containing radioactive material when—(e)
  - The quantity of material involved is greater than five times the lowest ALI specified for the material in 10 CFR 20.1001-2402, Appendix B (i)
  - The damage affects the integrity of the radioactive material or its container (ii)

**Reports of Overexposures and Excessive Levels and Concentrations of Radioactivity (D)**

In addition to any notification required by Section (C) of this part, headquarters and regional offices shall submit a written report to the Director of NMSS and the appropriate Deputy Executive Director for Operations within 30 days of discovering any of the following events: (1)

- Each exposure of an individual to radiation or radioactive material in excess of the applicable limits specified in Part II of this handbook (a)
- Any incident for which notification is required by Section (C) of this part (b)



**Reports of Overexposures and Excessive Levels and Concentrations of Radioactivity (D) (continued)**

- Levels of radiation or concentrations of radioactive material in—(c)
  - A restricted area in excess of any applicable limit specified in 10 CFR Part 20 (i)
  - An unrestricted area in excess of 10 times any applicable limit specified in 10 CFR Part 20, whether or not these levels cause an overexposure (ii)

Each written report required by this section must describe the extent of exposure of individuals to radiation or to radioactive material, including, as appropriate—(2)

- Estimates of each individual's dose (a)
- The levels of radiation and concentrations of radioactive material involved (b)
- The cause of the event (c)
- The corrective steps taken or planned (d)

Each written report required by this section shall include, in a separate and detachable part, the name, social security number, and date of birth for each individual exposed. If an embryo or a fetus is involved, the identifiers should be those of the declared pregnant woman. (3)

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**Reports of Planned Special  
Exposures (E)**

Headquarters and regional offices shall submit a written report to the Director of NMSS and the appropriate Deputy Executive Director for Operations within 30 days of any planned special exposure informing them that a planned special exposure was conducted, indicating the date the planned special exposure occurred, and providing the information required by Section (A)(5)(a) of this part.

**Notifications and Reports to  
Individuals (F)**

Radiation exposure data for an individual and the results of any measurements, analyses, and calculations of radioactive material deposited or retained in the body of an individual will be reported to the individual on at least an annual basis or as otherwise specified in this part. The information reported will include data and results obtained pursuant to the provisions of this handbook. Each notification and report will be in writing and will include appropriate identifying data, such as the name of the individual, the individual's social security number, and the individual's exposure information: (1)

NRC management shall inform the employee that (a) the report is furnished under the provisions of NRC Management Directive 10.131 and (b) the report should be preserved for further reference.

At the employee's request, the NRC shall advise the employee of any exposure to radiation or radioactive material as shown in records maintained pursuant to this handbook. (2)

At the request of an individual formerly engaged in activities involving exposure to radiation while employed by the NRC, the

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**Notifications and Reports to  
Individuals (F) (continued)**

individual will be furnished a report of exposure to radiation or radioactive material. This report—(3)

- Will be furnished within 30 days from the time the request is made or within 30 days after the exposure has been determined, whichever is later (a)
- Will cover, for the period of time specified in the request, each year in which the individual's activities involved exposure to radiation or radioactive material associated with NRC activities (b)
- Will include the dates and office assignments for the individual who participated during this period (c)

When a report of an overexposure to radiation or radioactive material is required under Section (D) of this part, the individual shall be notified. The NRC shall transmit this notice before or at the same time as the report. (4)

At the request of an individual who is terminating NRC employment that involved exposure to radiation or radioactive materials, the NRC shall provide, at termination, a written report regarding the radiation dose received by that individual during his or her employment with the NRC. If the most recent individual monitoring results are not available at that time, a written estimate will be provided, together with a clear indication that it is an estimate. (5)

**Part VI**  
**Guidance for Emergency Exposure Control**  
**During Rescue and Recovery Activities**

**Purpose (A)**

The emergency action guidance contained in this part provides instructions and background information for use by NRC employees in determining appropriate actions for the rescue and recovery of persons and the protection of health and property during an emergency.

**General Considerations (B)**

Rescue and recovery operations should always be performed so as to minimize the risk of injury to those persons involved in such operations, to limit radiation exposures consistent with the saving of human life and the recovery of deceased victims, and to protect the health of the public and preserve property. Performing rescue and recovery operations requires the prompt assessment of hazards that may be involved with these operations and the determination of alternate methods of accomplishing them. Sound judgment, flexible plans, and adequate and versatile resources are crucial to the success of rescue and recovery operations. (1)

To avoid undue restrictions on actions that may be necessary during rescue and recovery operations, these instructions include flexibility in the establishment of exposure limits by responsible officials. The determination of exposures appropriate to rescue and recovery operations is the responsibility of the official in charge of these operations. (2)

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**General Considerations (B) (continued)**

The official in charge of the rescue or recovery activity shall determine the suitability of any proposed action involving radiation exposure by weighing the risks of radiation exposure, actual or potential, against the benefits to be gained by the proposed action. The magnitude of the expected individual and collective doses and the biological consequences related to these doses are the essential elements to be evaluated in making a risk determination. (3)

The following tables list some of the biological effects associated with various radiation doses. (4)

**Table VI-1 Health Effects Associated With Whole-Body Absorbed Doses Received Within a Few Hours\***

| <b>Whole-Body Absorbed Dose (rads)</b> | <b>Early Fatalities (percent)</b> | <b>Whole-Body Absorbed Dose (rads)</b> | <b>Prodromal Effects** (percent affected)</b> |
|----------------------------------------|-----------------------------------|----------------------------------------|-----------------------------------------------|
| 140                                    | 5                                 | 50                                     | 2                                             |
| 200                                    | 15                                | 100                                    | 15                                            |
| 300                                    | 50                                | 150                                    | 50                                            |
| 400                                    | 85                                | 200                                    | 85                                            |
| 460                                    | 95                                | 250                                    | 98                                            |

\*EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," May 1992.

\*\*Warning symptoms (e.g., nausea, fatigue, and so on) of more serious health effects associated with large doses of radiation.

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**General Considerations (B) (continued)**

**Table VI-2 Approximate Cancer Risk to Average  
Individuals From 25 Rem Effective Dose  
Equivalent Delivered Promptly\***

| <b>Age at<br/>Exposure<br/>(years)</b> | <b>Approximate Risk of<br/>Premature Death<br/>(deaths per 1,000<br/>persons exposed)</b> | <b>Average Years of Life<br/>Lost If Premature<br/>Death Occurs (years)</b> |
|----------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 20 to 30                               | 9.1                                                                                       | 24                                                                          |
| 30 to 40                               | 7.2                                                                                       | 19                                                                          |
| 40 to 50                               | 5.3                                                                                       | 15                                                                          |
| 50 to 60                               | 3.5                                                                                       | 11                                                                          |

\*EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," May 1992.

In these instructions, the criteria for accident situations that involve saving lives and valuable property and protecting the health of the public differ from the criteria for recovering deceased victims. In the latter instance, the amount of expected dose received by individual participants should be limited to occupational exposure limits. (5)

The use of potassium iodide will be considered to minimize thyroid doses. Potassium iodide shall be issued (1) in accordance with applicable medical guidelines, including the Food and Drug Administration Guidance, "Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies" (see Exhibit 3; available at <http://www.fda.gov/cder/guidance/4825fnl.pdf>) and (2) in accordance with Commission guidance, including the "Questions and Answers on Guidance: Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies," July 3, 2002 (see Exhibit 4). This process includes questioning individuals about possible allergic reactions. (6)

## **Emergency Situations (C)**

Specific dose criteria and judgment factors are specified for three categories of actions: saving human life, recovering deceased victims, and protecting health and property. When emergency actions are likely to affect an employee or a facility of an NRC licensee, emergency actions will be coordinated with those specified in the licensee's emergency plans or other existing plans to avoid any appreciable differences between dose criteria and judgment factors used by the NRC and the licensee. These actions will not be limited to the rescue of NRC employees and NRC contractors alone but will also apply to employees of licensees, contractors, and visitors. Guidance on dose limits for workers performing emergency services extracted from the Environmental Protection Agency (EPA) "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" is provided in Table VI-3 of this part.

### **Saving Human Life (1)**

When a reasonable expectation exists that an individual is alive within the affected areas during an emergency and is in need of rescue or medical treatment, the course of action to be pursued should be determined by the official on site having responsibility for emergency actions. (a)

The official on site having responsibility for emergency action shall determine the amount of exposure suitable for this type of action. The dose expected in performing the action must be weighed in terms of the effects of acute external whole-body exposure and the entry of radioactive material into the body. In accordance with EPA's protective action guide, the official may permit volunteers to receive a dose up to 25 rem total effective dose equivalent (TEDE) without informed consent for emergency lifesaving activities. Any lifesaving action that may involve a dose greater than 25 rem TEDE, or other substantial personal risk, must be performed by volunteers advised of the known or estimated risk

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**Emergency Situations (C) (continued)**

**Saving Human Life (1) (continued)**

before participation. Preference will be given to volunteers who meet the following criteria: (b)

- Over 45 years of age (i)
- Physically fit and in good physical condition as determined by a recent physical examination, for example, no adverse heart condition (ii)

In establishing exposure limits for the rescue operation, the official shall keep in mind that the accuracy of the prediction of radiation injury cannot be any better than the accuracy of the dose estimate. Therefore, consideration will be given to limits of error associated with the specific instruments and techniques used to estimate the dose. This process is especially crucial when the estimated doses are greater than 25 rem. The possibility of reducing estimated doses through appropriate mechanisms, such as the use of protective equipment, remote manipulation equipment, the use of potassium iodide, or similar means, will be considered. (c)

When making a decision to perform the action, the risk to rescue personnel will be weighed against the probability of the success of the rescue action. (d)

**Protecting Health and Property (2)**

When the risk (probability and severity) of the radiation hazard either bears significantly on the state of health of people or may result in undue loss of property and requires immediate remedial action, the following criteria apply:

- When the official in charge of emergency action on site deems it essential to reduce a potential hazard or to prevent a



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**Emergency Situations (C) (continued)**

**Protecting Health and Property (2) (continued)**

substantial loss of property and determines that occupational dose limits applicable to routine operations may be exceeded, an emergency exposure consistent with guidance on dose limits specified in Table VI-3 may be authorized. However, planned special exposures are encouraged if there is time (see Part II of this handbook). (a)

- When the potential risk of radiation hazard following a nuclear incident jeopardizes life or poses severe adverse effects on the public health, the criteria specified in Section (C)(1) of this part for the saving of human life apply. (b)

**Recovering Deceased Victims (3)**

Accidents that involve recovering deceased victims require criteria different from those for saving lives. Because the element of time is no longer a critical factor, more time may be allowed for the planning of the recovery operation. The amount of radiation exposure received by persons engaged in these recovery operations should be within existing occupational exposure limits. (See Part II of this handbook.) (a)

When bodies are located in areas that are inaccessible because of high radiation fields and the recovery mission would result in exposure in excess of occupational exposure limits, remote recovery devices will be used to the extent practical to retrieve the bodies. (b)

In special circumstances, such as the entry of emergency workers into high radiation fields to recover bodies, the individual in charge of the recovery mission may determine that it is necessary to exceed the occupational exposure limits applicable to routine operations. In this case, a planned special exposure may be

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**Emergency Situations (C) (continued)**

**Recovering Deceased Victims (3) (continued)**

authorized for participating individuals. (See Part II of this handbook.) (c)

**Table VI-3 Guidance on Dose Limits for Workers  
Performing Emergency Services\***

| <b>Dose Limit (rem)</b> | <b>Activity</b>                            | <b>Condition</b>                                              |
|-------------------------|--------------------------------------------|---------------------------------------------------------------|
| 5                       | All                                        | None                                                          |
| 10                      | Protecting valuable property               | Lower dose not practicable                                    |
| 25                      | Lifesaving or protecting large populations | Lower dose not practicable                                    |
| >25                     | Lifesaving or protecting large populations | Only on a voluntary basis to persons fully aware of the risks |

\*EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," May 1992.

**NOTE:** "Dose limit" refers to the sum of external effective dose equivalent and committed effective dose equivalent to nonpregnant adults from exposure and intake during an emergency situation. Workers performing services during emergencies should limit the dose to the lens of the eye to three times the listed value and doses to any other organ, including skin and body extremities, to 10 times the listed values.

Dose limits for Planned Special Exposures are specified in 10 CFR 20.1206.

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**Implementation (D)**

Each regional office must establish a plan to implement this guidance for emergency response during rescue and recovery activities. This plan will—

- Designate an individual by position or title who has authority to authorize emergency workers to receive doses in excess of limits specified in this handbook. The regional administrator in each region should be designated as the lead person in charge of emergency action for the region. (1)
- Provide for periodic training, including written examinations, to all appropriate regional personnel on the emergency exposure procedures to be followed during rescue and recovery activities. (2)

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**Exhibit 1  
FORM LETTER FOR DECLARING PREGNANCY<sup>1</sup>**

This form letter is provided for your convenience. To make your written declaration of pregnancy, you may fill in the blanks in this form letter or you may write your own letter.

**DECLARATION OF PREGNANCY**

To: \_\_\_\_\_

In accordance with the NRC's Management Directive 10.131, "Protection of NRC Employees Against Ionizing Radiation,"<sup>2</sup> I am declaring that I am pregnant. I believe I became pregnant in \_\_\_\_\_ (only the month and year need be provided).

I understand the radiation dose to my embryo/fetus during my entire pregnancy will not be allowed to exceed 0.5 rem (5 millisievert) (unless that dose has already been exceeded between the time of conception and submitting this letter). I also understand that my Radiation Safety Officer will be notified of my pregnancy in order to ensure that the lower dose limit is met, and I understand that meeting the lower dose limit may require a change in job or job responsibilities during my pregnancy.

\_\_\_\_\_  
(Your Signature)

\_\_\_\_\_  
(Your Name Printed)

\_\_\_\_\_  
(Date)

---

<sup>1</sup>This form letter is taken from NRC Regulatory Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure," June 1999. It has been adapted for use by NRC employees.

<sup>2</sup>Applying to NRC employees the same dose limits that are applicable to employees of NRC licensees under 10 CFR 20.1208, "Dose Equivalent to an Embryo/Fetus."

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**Exhibit 2  
 NRC Form 525, "Request for and Authorization  
 of Release of Dosimetry Records"**

|                                                                                                                                                                                                                                                                                                                               |  |                                    |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------|------|
| NRC FORM 525<br>(11-91)                                                                                                                                                                                                                                                                                                       |  | U.S. NUCLEAR REGULATORY COMMISSION |      |
| <b>REQUEST FOR AND AUTHORIZATION OF RELEASE<br/>OF DOSIMETRY RECORDS</b>                                                                                                                                                                                                                                                      |  |                                    |      |
| <b>REQUEST TO</b>                                                                                                                                                                                                                                                                                                             |  |                                    |      |
| NAME OF ORGANIZATION                                                                                                                                                                                                                                                                                                          |  | NAME OF FACILITY                   |      |
| ADDRESS                                                                                                                                                                                                                                                                                                                       |  |                                    |      |
| <b>REQUEST FROM</b>                                                                                                                                                                                                                                                                                                           |  |                                    |      |
| NAME OF NRC EMPLOYEE                                                                                                                                                                                                                                                                                                          |  | SOCIAL SECURITY NUMBER             |      |
| <b>EXPOSURE RECORD PERIOD</b>                                                                                                                                                                                                                                                                                                 |  |                                    |      |
| BEGINNING                                                                                                                                                                                                                                                                                                                     |  | ENDING                             |      |
| <p>I request, pursuant to 10 CFR 19.13, that a copy of my exposure records required by 10 CFR 20.401(a) and (c) for the period listed here be provided to:</p> <p align="center">RADIATION SAFETY OFFICER<br/>         MAIL STOP _____<br/>         U. S. NUCLEAR REGULATORY COMMISSION<br/>         WASHINGTON, DC 20555</p> |  |                                    |      |
| SIGNATURE - NRC EMPLOYEE                                                                                                                                                                                                                                                                                                      |  |                                    | DATE |

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**Exhibit 2 (continued)**

**PRIVACY ACT STATEMENT**

Pursuant to 5 U.S.C. 552a(e)(3), enacted into law by Section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the Nuclear Regulatory Commission on NRC Form 526. This information is maintained in a system of records designated as NRC-11 and described at 55 Federal Register 33973 (August 20, 1990).

1. **AUTHORITY:** 42 U.S.C. 2073, 2093, 2095, 2111, 2133, 2134, and 2201(c) (1988). The authority for soliciting the social security number is Executive Order 9397, dated November 22, 1943.
2. **PRINCIPAL PURPOSE(S):** The information is used by the NRC in its evaluation of the risk of radiation exposure associated with NRC activities and in exercising its statutory responsibility to monitor and regulate the safety and health practices of its employees. The data permits maintaining a complete record of radiation exposure received while performing NRC business. Data on your exposure to radiation is available to you upon your request.
3. **ROUTINE USES:** The information may be used to provide data to other Federal and State agencies involved in monitoring and/or evaluating radiation exposure received by NRC employees employed as radiation workers on a permanent or temporary basis and exposure received by monitored visitors. This information may also be disclosed to an appropriate Federal, State, or local agency in the event the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding.
4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION:** It is voluntary that you furnish the requested information, including social security number; however, the licensee must provide radiation exposure data upon your request as required under 10 CFR 19.13 and in accordance with the requirements imposed under 10 CFR 20.401 to keep records of radiation exposure of all individuals entering a restricted area. Failure to provide the social security number to the licensee may result in the licensee being unable to accurately identify the individual requesting radiation exposure information. The social security number is used to ensure that NRC and the licensee have an accurate identifier not subject to the coincidence of similar names or birthdates among the large number of persons on whom data is maintained.
5. **SYSTEM MANAGER(S) AND ADDRESS:**  
  
DIRECTOR  
OFFICE OF PERSONNEL  
U. S. NUCLEAR REGULATORY COMMISSION  
WASHINGTON DC 20555

**Exhibit 3  
Guidance: Potassium Iodide as a Thyroid  
Blocking Agent in Radiation Emergencies**

**Guidance  
Potassium Iodide as a Thyroid  
Blocking Agent in Radiation  
Emergencies**

*Additional copies are available from:*

*Office of Training and Communications  
Division of Communications Management  
Drug Information Branch, HFD-210  
5600 Fishers Lane  
Rockville, MD 20857  
(Tel) 301-827-4573*

*(Internet) <http://www.fda.gov/cder/guidance/index.htm>*

**U.S. Department of Health and Human Services  
Food and Drug Administration  
Center for Drug Evaluation and Research (CDER)**

**December 2001  
Procedural**

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**Exhibit 3 (Continued)**

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**Exhibit 3 (Continued)**

**Guidance  
Potassium Iodide as a Thyroid Blocking  
Agent in Radiation Emergencies**

This guidance represents the Food and Drug Administration's (FDA's) current thinking on this topic. It does not create or confer any rights for or on any person and does not operate to bind FDA or the public. An alternative approach may be used if such approach satisfies the requirements of the applicable statutes and regulations.

**I. INTRODUCTION**

The objective of this document is to provide guidance to other Federal agencies, including the Environmental Protection Agency (EPA) and the Nuclear Regulatory Commission (NRC), and to state and local governments regarding the safe and effective use of potassium iodide (KI) as an adjunct to other public health protective measures in the event that radioactive iodine is released into the environment. The adoption and implementation of these recommendations are at the discretion of the state and local governments responsible for developing regional emergency-response plans related to radiation emergencies.

This guidance updates the Food and Drug Administration (FDA) 1982 recommendations for the use of KI to reduce the risk of thyroid cancer in radiation emergencies involving the release of radioactive iodine. The recommendations in this guidance address KI dosage and the projected radiation exposure at which the drug should be used.

These recommendations were prepared by the Potassium Iodide Working Group, comprising scientists from the FDA's Center for Drug Evaluation and Research (CDER) and Center for Devices and Radiological Health (CDRH) in collaboration with experts in the field from the National Institutes of Health (NIH). Although they differ in two respects (as discussed in Section IV.B), these revised recommendations are in general accordance with those of the World Health Organization (WHO), as expressed in its *Guidelines for Iodine Prophylaxis Following Nuclear Accidents: Update 1999* (WHO 1999).

**II. BACKGROUND**

Under 44 CFR 351, the Federal Emergency Management Agency (FEMA) has established roles and responsibilities for Federal agencies in assisting state and local governments in their radiological emergency planning and preparedness activities. The Federal agencies, including the Department of Health and Human Services (HHS), are to carry out these roles and responsibilities as members of the Federal Radiological Preparedness Coordinating Committee

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**Exhibit 3 (Continued)**

(FRPCC). Under 44 CFR 351.23(f), HHS is directed to provide guidance to state and local governments on the use of radioprotective substances and the prophylactic use of drugs (e.g., KI) to reduce the radiation dose to specific organs. This guidance includes information about dosage and projected radiation exposures at which such drugs should be used.

The FDA has provided guidance previously on the use of KI as a thyroid blocking agent. In the *Federal Register* of December 15, 1978, FDA announced its conclusion that KI is a safe and effective means by which to block uptake of radioiodines by the thyroid gland in a radiation emergency under certain specified conditions of use. In the *Federal Register* of June 29, 1982, FDA announced final recommendations on the administration of KI to the general public in a radiation emergency. Those recommendations were formulated after reviewing studies relating radiation dose to thyroid disease risk that relied on estimates of *external* thyroid irradiation after the nuclear detonations at Hiroshima and Nagasaki and analogous studies among children who received therapeutic radiation to the head and neck. Those recommendations concluded that at a projected dose to the thyroid gland of 25 cGy or greater from ingested or inhaled radioiodines, the risks of short-term use of small quantities of KI were outweighed by the benefits of suppressing radioiodine-induced thyroid cancer.<sup>1</sup> The amount of KI recommended at that time was 130 mg per day for adults and children above 1 year of age and 65 mg per day for children below 1 year of age. The guidance that follows revises our 1982 recommendations on the use of KI for thyroid cancer prophylaxis based on a comprehensive review of the data relating radioiodine exposure to thyroid cancer risk accumulated in the aftermath of the 1986 Chernobyl reactor accident.

**III. DATA SOURCES**

**A. Reliance on Data from Chernobyl**

In epidemiological studies investigating the relationship between thyroidal radioiodine exposure and risk of thyroid cancer, the estimation of thyroid radiation doses is a critical and complex aspect of the analyses. Estimates of exposure, both for individuals and across populations, have been reached in different studies by the variable combination of (1) direct thyroid measurements in a segment of the exposed population; (2) measurements of <sup>131</sup>I (iodine isotope) concentrations in the milk consumed by different groups (e.g., communities) and of the quantity of milk consumed; (3) inference from ground deposition of long-lived radioisotopes released coincidentally and presumably in fixed ratios with radioiodines; and (4) reconstruction of the nature and extent of the actual radiation release.

All estimates of individual and population exposure contain some degree of uncertainty. The uncertainty is least for estimates of individual exposure based on direct thyroid measurements.

<sup>1</sup> For the radiation emitted by <sup>131</sup>I (electrons and photons), the radiation-weighting factor is equal to one, so that the absorbed dose to the thyroid gland expressed in centigrays (cGy) is numerically equal to the thyroid equivalent dose expressed in rem (1 cGy = 1 rem).

**Exhibit 3 (Continued)**

Uncertainty increases with reliance on milk consumption estimates; is still greater with estimates derived from ground deposition of long-lived radioisotopes, and is highest for estimates that rely heavily on release reconstruction.

Direct measurements of thyroid radioactivity are unavailable from the Hanford, Nevada Test Site, and Marshall Islands exposures. Indeed, the estimates of thyroid radiation doses related to these releases rely heavily on release reconstructions and, in the former two cases, on recall of the extent of milk consumption 40 to 50 years after the fact. In the Marshall Islands cohort, urinary radioiodine excretion data were obtained and used in calculating exposure estimates.

Because of the great uncertainty in the dose estimates from the Hanford and Nevada Test Site exposures and due to the small numbers of thyroid cancers occurring in the populations potentially exposed, the epidemiological studies of the excess thyroid cancer risk related to these radioiodine releases are, at best, inconclusive. As explained below, the dosimetric data derived in the studies of individual and population exposures following the Chernobyl accident, although not perfect, are unquestionably superior to data from previous releases. In addition, the results of the earlier studies are inadequate to refute cogent case control study evidence from Chernobyl of a cause-effect relationship between thyroid radioiodine deposition and thyroid cancer risk.<sup>2</sup>

The Chernobyl reactor accident of April 1986 provides the best-documented example of a massive radionuclide release in which large numbers of people across a broad geographical area were exposed acutely to radioiodines released into the atmosphere. Therefore, the recommendations contained in this guidance are derived from our review of the Chernobyl data as they pertain to the large number of thyroid cancers that occurred. These are the most comprehensive and reliable data available describing the relationship between thyroid radiation dose and risk for thyroid cancer following an environmental release of <sup>131</sup>I. In contrast, the exposures resulting from radiation releases at the Hanford Site in Washington State in the mid-1940s and in association with the nuclear detonations at the Nevada Test Site in the 1950s were extended over years, rather than days to weeks, contributing to the difficulty in estimating radioactive dose in those potentially exposed (Davis et al., 1999; Gilbert et al., 1998). The exposure of Marshall Islanders to fallout from the nuclear detonation on Bikini in 1954 involved relatively few people, and although the high rate of subsequent thyroid nodules and cancers in the exposed population was likely caused in large part by radioiodines, the Marshall Islands data provide little insight into the dose-response relationship between radioactive iodine exposure and thyroid cancer risk (Robbins and Adams 1989).

Beginning within a week after the Chernobyl accident, direct measurements of thyroid exposure were made in hundreds of thousands of individuals, across three republics of the former Soviet Union (Robbins and Schneider 2000, Gavrilin et al., 1999, Likharev et al., 1993, Zvonova and Balonov 1993). These thyroid measurements were used to derive, in a direct manner, the thyroid doses received by the individuals from whom the measurements were taken. The thyroid measurements were also used as a guide to estimate the thyroid doses received by other people, taking into account differences in age, milk consumption rates, and ground deposition densities, among other things. The thyroid doses derived from thyroid measurements have a large degree

<sup>2</sup> We have included in this guidance an extensive bibliography of the sources used in developing these revised recommendations.

**Exhibit 3 (Continued)**

of uncertainty, especially in Belarus, where most of the measurements were made by inexperienced people with detectors that were not ideally suited to the task at hand (Gavrilin et al., 1999 and UNSCEAR 2000). However, as indicated above, the uncertainties attached to thyroid dose estimates derived from thyroid measurements are, as a rule, lower than those obtained without recourse to those measurements.

It is also notable that the thyroid radiation exposures after Chernobyl were virtually all *internal*, from radioiodines. Despite some degree of uncertainty in the doses received, it is reasonable to conclude that the contribution of external radiation was negligible for most individuals. This distinguishes the Chernobyl exposures from those of the Marshall Islanders. Thus, the increase in thyroid cancer seen after Chernobyl is attributable to ingested or inhaled radioiodines. A comparable burden of excess thyroid cancers could conceivably accrue should U.S. populations be similarly exposed in the event of a nuclear accident. This potential hazard highlights the value of averting such risk by using KI as an adjunct to evacuation, sheltering, and control of contaminated foodstuffs.

**B. Thyroid Cancers in the Aftermath of Chernobyl**

The Chernobyl reactor accident resulted in massive releases of <sup>131</sup>I and other radioiodines. Beginning approximately 4 years after the accident, a sharp increase in the incidence of thyroid cancer among children and adolescents in Belarus and Ukraine (areas covered by the radioactive plume) was observed. In some regions, for the first 4 years of this striking increase, observed cases of thyroid cancer among children aged 0 through 4 years at the time of the accident exceeded expected number of cases by 30- to 60-fold. During the ensuing years, in the most heavily affected areas, incidence is as much as 100-fold compared to pre-Chernobyl rates (Robbins and Schneider 2000; Gavrilin et al., 1999; Likharev et al., 1993; Zvonova and Balonov 1993). The majority of cases occurred in children who apparently received less than 30 cGy to the thyroid (Astakhova et al., 1995). A few cases occurred in children exposed to estimated doses of < 1 cGy; however, the uncertainty of these estimates confounded by medical radiation exposures leaves doubt as to the causal role of these doses of radioiodine (Souchkevitch and Tsyb 1996).

The evidence, though indirect, that the increased incidence of thyroid cancer observed among persons exposed during childhood in the most heavily contaminated regions in Belarus, Ukraine, and the Russian Federation is related to exposure to iodine isotopes is, nevertheless, very strong (IARC 2001). We have concluded that the best dose-response information from Chernobyl shows a marked increase in risk of thyroid cancer in children with exposures of 5 cGy or greater (Astakhova et al., 1998; Ivanov et al., 1999; Kazakov et al., 1992). Among children born more than nine months after the accident in areas traversed by the radioactive plume, the incidence of thyroid cancer has not exceeded preaccident rates, consistent with the short half-life of <sup>131</sup>I.

The use of KI in Poland after the Chernobyl accident provides us with useful information regarding its safety and tolerability in the general population. Approximately 10.5 million children under age 16 and 7 million adults received at least one dose of KI. Of note, among newborns receiving single doses of 15 mg KI, 0.37 percent (12 of 3214) showed transient increases in TSH (thyroid stimulating hormone) and decreases in FT4 (free thyroxine). The side

**Exhibit 3 (Continued)**

effects among adults and children were generally mild and not clinically significant. Side effects included gastrointestinal distress, which was reported more frequently in children (up to 2 percent, felt to be due to bad taste of SSKI solution) and rash (~1 percent in children and adults). Two allergic reactions were observed in adults with known iodine sensitivity (Naumov and Wolff 1993).

Thus, the studies following the Chernobyl accident support the etiologic role of relatively small doses of radioiodine in the dramatic increase in thyroid cancer among exposed children. Furthermore, it appears that the increased risk occurs with a relatively short latency. Finally, the Polish experience supports the use of KI as a safe and effective means by which to protect against thyroid cancer caused by internal thyroid irradiation from inhalation of contaminated air or ingestion of contaminated food and drink when exposure cannot be prevented by evacuation, sheltering, or food and milk control.

**IV. CONCLUSIONS AND RECOMMENDATIONS**

**A. Use of KI in Radiation Emergencies: Rationale, Effectiveness, Safety**

For the reasons discussed above, the Chernobyl data provide the most reliable information available to date on the relationship between internal thyroid radioactive dose and cancer risk. They suggest that the risk of thyroid cancer is inversely related to age, and that, especially in young children, it may accrue at very low levels of radioiodine exposure. We have relied on the Chernobyl data to formulate our specific recommendations below.

The effectiveness of KI as a specific blocker of thyroid radioiodine uptake is well established (H' in LA, et al., 1972) as are the doses necessary for blocking uptake. As such, it is reasonable to conclude that KI will likewise be effective in reducing the risk of thyroid cancer in individuals or populations at risk for inhalation or ingestion of radioiodines.

Short-term administration of KI at thyroid blocking doses is safe and, in general, more so in children than adults. The risks of stable iodine administration include sialadenitis (an inflammation of the salivary gland, of which no cases were reported in Poland among users after the Chernobyl accident), gastrointestinal disturbances, allergic reactions and minor rashes. In addition, persons with known iodine sensitivity should avoid KI, as should individuals with dermatitis herpetiformis and hypocomplementemic vasculitis, extremely rare conditions associated with an increased risk of iodine hypersensitivity.

Thyroidal side effects of stable iodine include iodine-induced thyrotoxicosis, which is more common in older people and in iodine deficient areas but usually requires repeated doses of stable iodine. In addition, iodide goiter and hypothyroidism are potential side effects more common in iodine sufficient areas, but they require chronic high doses of stable iodine (Rubery 1990). In light of the preceding, individuals with multinodular goiter, Graves' disease, and autoimmune thyroiditis should be treated with caution, especially if dosing extends beyond a few days. The vast majority of such individuals will be adults.

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**Exhibit 3 (Continued)**

The transient hypothyroidism observed in 0.37 percent (12 of 3214) of neonates treated with KI in Poland after Chernobyl has been without reported sequelae to date. There is no question that the benefits of KI treatment to reduce the risk of thyroid cancer outweigh the risks of such treatment in neonates. Nevertheless, in light of the potential consequences of even transient hypothyroidism for intellectual development, we recommend that neonates (within the first month of life) treated with KI be monitored for this effect by measurement of TSH (and FT4, if indicated) and that thyroid hormone therapy be instituted in cases in which hypothyroidism develops (Bongers-Schokking 2000; Fisher 2000; Calaciura 1995).

**B. KI Use in Radiation Emergencies: Treatment Recommendations**

After careful review of the data from Chernobyl relating estimated thyroid radiation dose and cancer risk in exposed children, FDA is revising its recommendation for administration of KI based on age, predicted thyroid exposure, and pregnancy and lactation status (see Table).

| Threshold Thyroid Radioactive Exposures and Recommended Doses of KI for Different Risk Groups |                                  |              |                     |                    |
|-----------------------------------------------------------------------------------------------|----------------------------------|--------------|---------------------|--------------------|
|                                                                                               | Predicted Thyroid exposure (cGy) | KI dose (mg) | # of 130 mg tablets | # of 65 mg tablets |
| Adults over 40 yrs                                                                            | >500                             | 130          | 1                   | 2                  |
| Adults over 18 through 40 yrs                                                                 | >10                              |              |                     |                    |
| Pregnant or lactating women                                                                   |                                  |              |                     |                    |
| Adolesc. over 12 through 18 yrs*                                                              | ≥ 5                              | 65           | 1/2                 | 1                  |
| Children over 3 through 12 yrs                                                                |                                  | 32           | 1/4                 | 1/2                |
| Over 1 month through 3 years                                                                  |                                  | 16           | 1/8                 | 1/4                |
| Birth through 1 month                                                                         |                                  |              |                     |                    |

\*Adolescents approaching adult size (≥ 70 kg) should receive the full adult dose (130 mg).

The protective effect of KI lasts approximately 24 hours. For optimal prophylaxis, KI should therefore be dosed daily, until a risk of significant exposure to radioiodines by either inhalation or ingestion no longer exists. Individuals intolerant of KI at protective doses, and neonates, pregnant and lactating women (in whom repeat administration of KI raises particular safety issues, see below) should be given priority with regard to other protective measures (i.e., sheltering, evacuation, and control of the food supply).

Note that adults over 40 need take KI only in the case of a projected large internal radiation dose to the thyroid (>500 cGy) to prevent hypothyroidism.

These recommendations are meant to provide states and local authorities as well as other agencies with the best current guidance on safe and effective use of KI to reduce thyroidal radioiodine exposure and thus the risk of thyroid cancer. FDA recognizes that, in the event of an emergency, some or all of the specific dosing recommendations may be very difficult to carry

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**Exhibit 3 (Continued)**

our given their complexity and the logistics of implementation of a program of KI distribution. The recommendations should therefore be interpreted with flexibility as necessary to allow optimally effective and safe dosing given the exigencies of any particular emergency situation. In this context, we offer the following critical general guidance: *across populations at risk for radioiodine exposure, the overall benefits of KI far exceed the risks of overdosing, especially in children, though we continue to emphasize particular attention to dose in infants.*

These FDA recommendations differ from those put forward in the World Health Organization (WHO) 1999 guidelines for iodine prophylaxis in two ways. WHO recommends a 130-mg dose of KI for adults and adolescents (over 12 years). For the sake of logistical simplicity in the dispensing and administration of KI to children, FDA recommends a 65-mg dose as standard for all school-age children while allowing for the adult dose (130 mg, 2 X 65 mg tablets) in adolescents approaching adult size. The other difference lies in the threshold for predicted exposure of those up to 18 years of age and of pregnant or lactating women that should trigger KI prophylaxis. WHO recommends a threshold of 1 cGy for these two groups. As stated earlier, FDA has concluded from the Chernobyl data that the most reliable evidence supports a significant increase in the risk of childhood thyroid cancer at exposures of 5 cGy or greater.

The downward KI dose adjustment by age group, based on body size considerations, adheres to the principle of minimum effective dose. The recommended standard dose of KI for all school-age children is the same (65 mg). However, adolescents approaching adult size (i.e., >70 kg) should receive the full adult dose (130 mg) for maximal block of thyroid radioiodine uptake. Neonates ideally should receive the lowest dose (16 mg) of KI. Repeat dosing of KI should be avoided in the neonate to minimize the risk of hypothyroidism during that critical phase of brain development (Bongers-Schokking 2000; Calaciura et al., 1995). KI from tablets (either whole or fractions) or as fresh saturated KI solution may be diluted in milk, formula, or water and the appropriate volume administered to babies. As stated above, we recommend that neonates (within the first month of life) treated with KI be monitored for the potential development of hypothyroidism by measurement of TSH (and FT4, if indicated) and that thyroid hormone therapy be instituted in cases in which hypothyroidism develops (Bongers-Schokking 2000; Fisher 2000; Calaciura et al., 1995).

Pregnant women should be given KI for their own protection and for that of the fetus, as iodine (whether stable or radioactive) readily crosses the placenta. However, because of the risk of blocking fetal thyroid function with excess stable iodine, repeat dosing with KI of pregnant women should be avoided. Lactating females should be administered KI for their own protection, as for other young adults, and potentially to reduce the radioiodine content of the breast milk, but not as a means to deliver KI to infants, who should get their KI directly. As for direct administration of KI, stable iodine as a component of breast milk may also pose a risk of hypothyroidism in nursing neonates. Therefore, repeat dosing with KI should be avoided in the lactating mother, except during continuing severe contamination. If repeat dosing of the mother is necessary, the nursing neonate should be monitored as recommended above.

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**Exhibit 3 (Continued)**

**V. ADDITIONAL CONSIDERATIONS IN PROPHYLAXIS AGAINST THYROID  
RADIOIODINE EXPOSURE**

Certain principles should guide emergency planning and implementation of KI prophylaxis in the event of a radiation emergency. After the Chernobyl accident, across the affected populations, thyroid radiation exposures occurred largely due to consumption of contaminated fresh cow's milk (this contamination was the result of milk cows grazing on fields affected by radioactive fallout) and to a much lesser extent by consumption of contaminated vegetables. In this or similar accidents, for those residing in the immediate area of the accident or otherwise directly exposed to the radioactive plume, inhalation of radioiodines may be a significant contributor to individual and population exposures. As a practical matter, it may not be possible to assess the risk of thyroid exposure from inhaled radioiodines at the time of the emergency. The risk depends on factors such as the magnitude and rate of the radioiodine release, wind direction and other atmospheric conditions, and thus may affect people both near to and far from the accident site.

For optimal protection against inhaled radioiodines, KI should be administered before or immediately coincident with passage of the radioactive cloud, though KI may still have a substantial protective effect even if taken 3 or 4 hours after exposure. Furthermore, if the release of radioiodines into the atmosphere is protracted, then, of course, even delayed administration may reap benefits by reducing, if incompletely, the total radiation dose to the thyroid.

Prevention of thyroid uptake of ingested radioiodines, once the plume has passed and radiation protection measures (including KI) are in place, is best accomplished by food control measures and not by repeated administration of KI. Because of radioactive decay, grain products and canned milk or vegetables from sources affected by radioactive fallout, if stored for weeks to months after production, pose no radiation risk. Thus, late KI prophylaxis at the time of consumption is not required.

As time is of the essence in optimal prophylaxis with KI, timely administration to the public is a critical consideration in planning the emergency response to a radiation accident and requires a ready supply of KI. State and local governments choosing to incorporate KI into their emergency response plans may consider the option of predistribution of KI to those individuals who do not have a medical condition precluding its use.

**VI. SUMMARY**

FDA maintains that KI is a safe and effective means by which to prevent radioiodine uptake by the thyroid gland, under certain specified conditions of use, and thereby obviate the risk of thyroid cancer in the event of a radiation emergency. Based upon review of the literature, we have proposed lower radioactive exposure thresholds for KI prophylaxis as well as lower doses of KI for neonates, infants, and children than we recommended in 1982. As in our 1982 notice in the *Federal Register*, FDA continues to recommend that radiation emergency response plans include provisions, in the event of a radiation emergency, for informing the public about the magnitude of the radiation hazard, about the manner of use of KI and its potential benefits and



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**Exhibit 3** (Continued)

risks, and for medical contact, reporting, and assistance systems. FDA also emphasizes that emergency response plans and any systems for ensuring availability of KI to the public should recognize the critical importance of KI administration in advance of exposure to radioiodine. As in the past, FDA continues to work in an ongoing fashion with manufacturers of KI to ensure that high-quality, safe, and effective KI products are available for purchase by consumers as well as by state and local governments wishing to establish stores for emergency distribution.

KI provides protection only for the thyroid from radioiodines. It has no impact on the uptake by the body of other radioactive materials and provides no protection against external irradiation of any kind. FDA emphasizes that the use of KI should be as an adjunct to evacuation (itself not always feasible), sheltering, and control of foodstuffs.

**ACKNOWLEDGMENTS**

The KI Taskforce would like to extend special thanks to our members from the NIH: Jacob Robbins, M.D., and Jan Wolff, Ph.D., M.D., of the National Institute of Diabetes, Digestive, and Kidney Diseases and Andre Bouville, Ph.D., of the National Cancer Institute. In addition, we would like to thank Dr. David V. Becker of the Department of Radiology, Weill Medical College (WMC) of Cornell University and The New York Presbyterian Hospital-WMC Cornell Campus, for his valuable comments on the draft.

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**Exhibit 3 (Continued)**

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**Exhibit 4  
 Questions and Answers on Guidance:  
 Potassium Iodide as a Thyroid Blocking  
 Agent in Radiation Emergencies**

**Why would I be offered KI?**

As a resident inspector, a regional inspector, or a site team member, you may be offered potassium iodide (KI) while responding to an emergency. It will be offered only when exposure to radioactive iodine is possible. The purpose of KI is to saturate your thyroid gland with stable iodine to prevent absorption of radioactive iodine you may inhale or ingest.

**When is KI use recommended?**

The U.S. Food and Drug Administration (FDA) is responsible for guidance on the use of KI. The attached guidance was recently issued by FDA based on lessons learned from the 1986 Chernobyl reactor accident. The guidance is summarized in the following table:

| <b>Predicted Thyroid Radiation Exposures<br/>at Which KI Prophylaxis Is Recommended<br/>and Recommended Daily Doses of KI<sup>1</sup></b> |                                                  |                 |                                |                               |
|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-----------------|--------------------------------|-------------------------------|
|                                                                                                                                           | Predicted Thyroid<br>Radiation Exposure<br>(cGy) | KI dose<br>(mg) | Number of<br>130 mg<br>tablets | Number of<br>65 mg<br>tablets |
| Adults over 40 yrs                                                                                                                        | ≥ 500                                            | 130             | 1                              | 2                             |
| Adults 18-40 yrs                                                                                                                          | ≥ 10                                             |                 |                                |                               |
| Pregnant or lactating<br>women <sup>2</sup>                                                                                               | ≥ 5                                              |                 |                                |                               |

<sup>1</sup>FDA Procedural Guidance, "Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies," December 2001, which is available at [www.fda.gov/cder/guidance/4825fn1.pdf](http://www.fda.gov/cder/guidance/4825fn1.pdf). (See Exhibit 3 of Management Directive (MD) 10.131, "Protection of NRC Employees Against Ionizing Radiation.")

<sup>2</sup>MD 10.131 specifies that the dose to a declared pregnant woman must not exceed 0.5 rem during the entire pregnancy. A committed dose equivalent (CDE) of 5 rem to the thyroid is equal to a committed effective dose equivalent (CEDE) of 0.15 rem, which is well below the dose limit for declared pregnant women.

## **Exhibit 4** (continued)

In children and young adults (18 - 40 years old), the primary concern is the prevention of thyroid cancer. In adults over 40 years old, the primary concern is the prevention of hypothyroidism (deficient activity in the thyroid gland). It takes a very large radiation dose to impact thyroid function ( $\geq 500$  cGy<sup>3</sup>).

FDA recommends that pregnant women be given KI to protect themselves and their fetuses; however, repeated dosing should be avoided because excess iodine could block fetal thyroid function. Nursing mothers should take KI for their own protection, but not their infants who should get their KI directly. As with fetuses, repeated dosing of newborn infants (0 - 1 month) should be avoided.

### **Why isn't thyroid cancer the primary concern for older adults?**

According to experts at the FDA Center for Drug Evaluation and Research, the thyroid gland in children is more sensitive to radioactive iodine. The marked increase in thyroid cancer after the Chernobyl accident occurred in children less than 4 years of age at the time of the accident. Adults are relatively insensitive to the cancer risks of low doses of radioactive iodine. Also, on a population basis, the risk of adverse reactions to KI increases with age. Therefore, KI is not recommended for older adults unless the potential radiation dose is so high (500 cGy or more) that it could damage the thyroid gland, which would result in a lifelong requirement for thyroid hormone replacement.

### **Who will provide the KI?**

NRC will provide KI to each resident inspector office. In addition, each regional office maintains a supply of KI for site teams dispatched during an emergency. KI is typically provided as tablets and instructions will be included similar to other medications. We do not plan to stock KI at Headquarters. The Site Team typically includes regional staff only. If Headquarters staff are requested, they will obtain their KI from the region leading the Site Team.

### **Who at NRC determines when KI is recommended?**

The NRC Regional Administrator, in consultation with the Headquarters Executive Team, will determine when to recommend KI to resident inspectors and site team members. In

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<sup>3</sup>1 cGy = 1 rad.

### **Exhibit 4** (continued)

determining whether to recommend KI, managers will utilize the best available information from licensees and other response organizations to assess the total projected exposure to the individuals consistent with maintaining exposures as low as reasonably achievable and commensurate with the importance of the particular activity to the NRC mission. In doing this, overall exposure control such as available engineering controls, respiratory protection, stay times and evacuation of the area will be considered along with use of KI. In the absence of a recommendation to use KI, employee requests for KI during an emergency will be considered on a case-by-case basis.

#### **How effective is KI?**

The effectiveness of KI in blocking the uptake of radioactive iodine by the thyroid is well established. The protective effect of KI lasts for 24 hours. For optimal protection against inhaled radioactive iodine, KI should be used before or immediately coincident with exposure to a radioactive cloud, though KI may still have a substantial protective effect even if taken 3 or 4 hours after exposure. If a release is protracted, even a delayed use may help reduce the radiation dose to the thyroid. KI should be taken daily until the risk of significant exposure to radioactive iodine no longer exists. Once radioactive iodine is concentrated in your thyroid, KI is not effective at removing it.

#### **Are there any side effects?**

Adverse reactions are uncommon, but they are possible. The risks of stable iodine include sialadenitis (an inflammation of the salivary gland), gastrointestinal disturbances, allergic reactions, and minor rashes. Thyroidal side effects of stable iodine include iodine-induced thyrotoxicosis, which is more common in older people but usually requires repeated doses of stable iodine. In addition, iodide goiter and hypothyroidism are potential side effects, but they require chronic high doses of stable iodine also.

The use of KI is voluntary and you have the right to decline it. You are encouraged to consult with your personal physician or the NRC Health Center (301-415-8400) if you have questions about your personal situation.

You should decline the KI if any of the following statements apply to you:

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**Exhibit 4** (continued)

1. Your thyroid gland has been removed.
2. You are sensitive to iodine, or allergic to iodine [for example, you have experienced an adverse reaction after eating seafood, shellfish, or iodized salt; after applying topical iodine (e.g., tincture of iodine, povidone-iodine, betadine, and iodophore solutions) to a cut or injury; or after a medical diagnostic procedure involving the use of iodinated contrast material that you were told was likely a reaction to iodine].
3. You have dermatitis herpetiformis, or hypocomplementemic vasculitis.<sup>4</sup>

You should use caution in taking KI if you have any of the following conditions, especially if dosing extends beyond a few days:

1. You have multinodular goiter.
2. You have Graves' disease.
3. You have autoimmune thyroiditis.

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<sup>4</sup>Extremely rare conditions associated with an increased risk of iodine hypersensitivity.



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**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 6:02 PM  
**To:** steven.buntman@nnsa.doe.gov  
**Subject:** FW: SITUATION REPORT No. 10 03/16/I (SBU)  
**Attachments:** image001.gif  
  
**Categories:** FOIA

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**From:** OpsAlert [mailto:OpsAlert@state.gov]  
**Sent:** Wednesday, March 16, 2011 6:33 AM  
**Subject:** SITUATION REPORT No. 10 03/16/I (SBU)

SENSITIVE BUT UNCLASSIFIED



**EXECUTIVE SECRETARIAT**  
*Operations Center*

***SITUATION REPORT No. 10***

**Japan Earthquake TFJP01**

Wednesday, March 16, 2011  
0630 EDT, 1230 Cairo

(b)(5)

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**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Wednesday, March 16, 2011 5:33 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc; Hoc, PMT12; PMT01 Hoc; RST01 Hoc  
**Subject:** FW: Volcanology Direction

**Categories:** FOIA, Red Category

Updated

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**From:** RMTPACTSU\_DMP  
**Sent:** Wednesday, March 16, 2011 5:32 PM  
**To:** RMT\_PACTSU; DART\_PACTSU  
**Subject:** FW: Volcanology Direction

*Gavrielle Rosenthal  
Deputy Manager for Planning  
Pacific Tsunami and Japan Earthquake Response Management Team  
USAID/DHCA/OFDA  
[Rmtpactsu\\_dmp@ofda.gov](mailto:Rmtpactsu_dmp@ofda.gov)  
202-712-0039*

---

**From:** Mayberry, Gari(DCHA/OFDA) [<mailto:gmayberry@USAID.GOV>]  
**Sent:** Wednesday, March 16, 2011 5:24 PM  
**To:** Bock, Yoni; RMTPACTSU\_MLO  
**Cc:** ofdaPACOM; Stitt, Tony; RMTPACTSU\_DMP  
**Subject:** RE: Volcanology Direction

According to VDAP volcanologists, there is a slight possibility that an eruption at Fuji could be triggered by an earthquake, but the window for that happening after the M 9 earthquake has probably passed already. It's hard to say if the 1707 Fuji eruption was related to the M 8.6 earthquake that occurred 49 days before the eruption. So basically, we should be aware of the possibility, but not be too worried. Any volcanic activity would be preceded by low-level changes at the volcano that would provide a warning and the Japan Meteorological Agency and others are monitoring the volcano. Cheers, Gari

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**From:** Mayberry, Gari(DCHA/OFDA)  
**Sent:** Wednesday, March 16, 2011 12:21 PM  
**To:** OFDAGOV: Bock, Yoni; OFDAGOV: RMTPACTSU\_MLO  
**Cc:** OFDAGOV: ofdaPACOM; OFDAGOV: Stitt, Tony; OFDAGOV: RMTPACTSU\_DMP  
**Subject:** RE: Volcanology Direction

Some additional info. in from USGS... the last eruption of Fuji in 1707 was preceded by a M 8.6 earthquake off of the south coast of Honsu 49 days before the eruption. The eruption was large and the attached map shows the area where ash fell within the red lines. I'm working on getting more information about the likelihood of the earthquake being related to the 1707 eruption and what that might mean this time.

Not to panic anyone, but the 1707 eruption was quite large and a similar eruption today would impact Tokyo. I will work on getting more info. –Gari

**From:** Mayberry, Gari(DCHA/OFDA)  
**Sent:** Wednesday, March 16, 2011 10:57 AM  
**To:** OFDAGOV: Bock, Yoni; OFDAGOV: RMTFACTSU\_MLO  
**Cc:** OFDAGOV: ofdaPACOM; OFDAGOV: Stitt, Tony; OFDAGOV: RMTFACTSU\_DMP  
**Subject:** RE: Volcanology Direction

Hi Yoni,

The M 6.2 earthquake yesterday at 10:31:46 local time was close to Fuji off of the volcano's southwest flank (see attached image- the red star is the M 6.2 aftershock, the yellow and orange circles are other aftershocks, and the orange triangles are volcanoes). A significant earthquake near a volcano could impact activity, but I have not seen any reports of increased activity at Fuji. The volcano is well monitored by the Japanese, so they would be able to detect small changes at the volcano before a large eruption would occur. The last known eruption was in 1708 and it is not known when the volcano might erupt again.

I visited Fuji in 2007 and a scientist from the National Research Institute for Earth Science and Disaster Prevention reported that the last increase in volcano-related seismicity occurred in 2003. It was not followed by any other signs of increased activity and did not lead to an eruption. I have not seen reports of increased activity since then. The Japanese have developed volcano hazard maps (not risk as far as I know) and they have evacuation maps for times when there is snow and when there aren't.

If the military is planning to address the potential volcanic risk I suggest that they consult with a Japanese volcanologist. Some potential POCs are-

*Japan Meteorological Agency, Volcanological Division, 1-3-4 Ote-machi, Chiyoda-ku, Tokyo 100, Japan (URL: <http://www.jma.go.jp/jma/indexe.html>).*

*Setsuya Nakada, Hidefumi Watanabe, and Shin-ichi Sakai, Volcano Research Center, Earthquake Research Institute, University of Tokyo, Yayoi 1-1-1, Bunkyo-ku, Tokyo 113-0032, Japan (URL: [http://www.eri.u-tokyo.ac.jp/VRC/index\\_E.html](http://www.eri.u-tokyo.ac.jp/VRC/index_E.html); Email: [nakada@eri.u-tokyo.ac.jp](mailto:nakada@eri.u-tokyo.ac.jp), [kaneko@eri.u-tokyo.ac.jp](mailto:kaneko@eri.u-tokyo.ac.jp), [coco@eri.u-tokyo.ac.jp](mailto:coco@eri.u-tokyo.ac.jp));*

*National Research Institute for Earth Science and Disaster Prevention, 3-1 Tennodai, Tsukuba-shi, Ibaraki-ken, 305, Japan (URL: <http://www.bosai.go.jp/e/index.html>);*

You can see updates about volcanic activity in Japan at the Japan Meteorological Agency website <http://www.jma.go.jp/en/volcano/>

Since I am on the RMT, I cannot delve into the issue as much as I would like to. The USAID-US Geological Survey Volcano Disaster Assistance Program is monitoring the situation and I will forward your e-mail to them to see if they have any information to add.

You may have heard of a volcano in south Japan erupting. The Shinmoedake volcano (also called Kirishima) was erupting before the earthquake and the type of activity after the earthquake did not change, so it was not impacted by the earthquake. The article below discusses it fairly well.

If you need anything else please e-mail me at [gmayberry@usaid.gov](mailto:gmayberry@usaid.gov) and [rmtfactsu\\_elo@ofda.gov](mailto:rmtfactsu_elo@ofda.gov).

Stay safe over there.

Cheers,

Gari

**Volcano in Japan Makes List of Problems Even Longer**

Robert Dougherty Robert Dougherty – Mon Mar 14, 2:39 pm ET

Contribute content like this. [Start here](#).

A volcano in Japan serves as a true example of overkill. However, the volcano is putting one more twist on the nation's trying times. Sunday, a volcanic eruption occurred in the southwest, which reportedly shattered windows up to four miles away. Hundreds had to evacuate to get away from the falling ash, but this weekend, evacuations and the rush to avoid danger has been nothing new for the Japanese.

This is the fourth disaster, or potential disaster, to strike the nation in the last three days. The first two came together, as a historic 8.9 earthquake triggered it all and was followed closely by a tsunami. Then as the cleanup began, the Fukushima nuclear power plant became vulnerable and is still in danger of melting down.

The volcano serves as the least important disaster by comparison, especially since this one went off weeks earlier. According to the [Daily Mail](#), the Shinmoedake volcano had a brief eruption earlier this year, well before the earthquake and tsunami arrived.

Therefore, this eruption may not have that much to do with the earlier disasters, although the risk is still great. Friday's tragedies helped trigger the Fukushima crisis, and the aftermath might pose a risk to other areas as well. Since about 300 aftershocks have taken place after the initial quake, further tremors could trigger more problems for Japan.

As there's no proof yet the volcano was altered by the aftershocks, this may turn out to be nothing. But too many things have gone wrong thus far for anything to be dismissed. The [Los Angeles Times](#) stated Shinmoedake was 950 miles from the epicenter of the earthquake, which is too close for comfort.

Compared to the other tragedies this weekend, the eruption is a relatively small concern. The earthquake itself set the tragic bar for the nation, since it was the greatest in Japan's recorded history. The subsequent tsunami only made it worse, and added to the destructive path. As for the Fukushima incident, it hasn't been as devastating yet, although it could take a long time to ensure it will stay that way.

In between the earthquake and tsunami cleanup, and the fight to prevent a nuclear meltdown, Japan may be ill equipped to watch out for volcanoes right now. At the moment, Sunday's eruption is being treated as another sign of their trying times, rather than a major crisis in of itself. It may not be a full blown crisis yet, but they have to be sure, since they hardly need anything else to go wrong right now.

-----Original Message-----

From: Bock, Yoni [<mailto:ybock@ofda.gov>]  
Sent: Tuesday, March 15, 2011 8:46 PM  
To: OFDAGOV: RMTFACTSU\_MLO; Mayberry, Gari(DCHA/OFDA)  
Cc: OFDAGOV: ofdaPACOM  
Subject: FW: Volcanology Direction

Gari,

Any guidance/reference documents/links you could provide? The weather guy this morning briefed that based on the plate tectonics, yesterday's 6.2 temblor was on the same fault as Mt. Fuji. Anticipate eruption at any point in next few years... or maybe not. Can you email some reality... er, I mean info, that I can pass to them.

Thanks!

Yoni

-----  
Mr. Yonahton Bock

Military Liaison Officer / Civ-Mil Coordinator Japan Earthquake/Tsunami DART

Email: [ybock@usaid.gov](mailto:ybock@usaid.gov)

Blackberry: (b)(6)

DNS at USFJ: 225-4329, 3137, 2469

From US (or non DSN) (011 81) 425 522-511 From Japan (non DSN) 0425 522-511 after dial tone, ext 54329, 52469, 53137

Current Location: Yokota AB, Tokyo, Japan -----

-----  
From: Frost, Nathan N, GS-14 DNC USFJ J0 [mailto:(b)(6)]

Sent: Tue 3/15/2011 8:33 PM

To: Bock, Yoni

Cc: (b)(6); USFJ-CAT-J5; Huntington, Miki T LTC USA USFJ J54; Tran, John D Maj USAF USFJ J5; Cote, Benjamin F LCDR USN USFJ J52

Subject: Volcanology Direction

Mr Bock,

Please forward this email to your team volcanologist.

-----  
To: Whom it May Concern

Re: Vocanology, Seismology Expert Request

We have experienced hundreds of aftershocks in the wake of the Great Eastern Japan earthquake and have been tasked US Forces, Japan/OPERATION TOMODACHI commander to assemble experts in the event that aftershocks trigger volcanic activity. Please advise. Because we are--and will be--running 24-hour operations, please include all in the cc line of this email in any communications. Thank you.

Best regards,

NNF

NATHAN N. FROST

?????N?????

USFJ/J03 US Secretary, Joint Committee

?????????????

DSN: 225-4463 (prefix 315 if dialing stateside)

COMM: 042-552-2510 x54463

????(?????)042-552-2510??54463

STATESIDE COMM: 011-81-42-552-2510 x54463

SIPR: 

|        |
|--------|
| (b)(6) |
|--------|



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**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 5:16 PM  
**To:** LIA07 Hoc  
**Subject:** Addition to Contact List

**Categories:** FOIA

[Ops.cat@dhs.gov](mailto:Ops.cat@dhs.gov)

---

**From:** HOO Hoc  
**Sent:** Wednesday, March 16, 2011 5:32 PM  
**To:** Moore, Scott  
**Subject:** FW: SITUATION REPORT No. 11 03/16/III (SBU)  
**Attachments:** image001.gif

Per your request the latest Sit Rep is provided. This is put out by the State Department, so you would have to call the State Department and request to be added to the distribution list, or have our OST people provide you their distribution.

John Knoke

---

**From:** OpsAlert [mailto:OpsAlert@state.gov]  
**Sent:** Wednesday, March 16, 2011 4:04 PM  
**Subject:** SITUATION REPORT No. 11 03/16/III (SBU)

SENSITIVE BUT UNCLASSIFIED



**EXECUTIVE SECRETARIAT**  
*Operations Center*

***SITUATION REPORT No. 11***

**Japan Earthquake TFJP01**

**Wednesday, March 16, 2011  
1600 EDT, 2200 en route to Tunis**

(b)(5)

(b)(5)

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**To:**

Ops.CAT@dhs.gov

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 4:54 PM  
**To:** (b)(6)  
**Subject:** Earlier Request

**Categories:** FOIA

Please call me if you are still interested in map information for fault lines and location of nuclear power plants.

Beth Reed  
Federal Liaison Desk  
301-816-5208

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 4:50 PM  
**To:** steven.buntman@nnsa.doe.gov  
**Subject:** FW: DOE Monitoring Teams status

**Categories:** FOIA

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Wednesday, March 16, 2011 3:57 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc; LIA08 Hoc; Marshall, Jane; Burnell, Scott; McIntyre, David; Hoc, PMT12; PMT01 Hoc; Grant, Jeffery; Gott, William; Harrington, Holly  
**Subject:** DOE Monitoring Teams status

**Subject:** DOE Monitoring Teams status

FYI:

AMS has developed a plan for operations. The first flight is scheduled for 0800 JST 17 March 2011. Their Ops Plan includes flights of the areas between Tokyo and Fukushima which will be coordinated with the CM Home Team for the production of monitoring products. There is a two-person monitoring (expert) support at the USEMB TOKYO from the TCMRT. The direction to the TCMRT is not to have a lot of teams just "running" around the country monitoring; we are working up monitoring plans for areas that are to be identified by the Government of Japan and US Forces Japan. Currently there are no field monitoring teams conducting operations off the Yokota AB.

---

**From:** Smith, Theodore  
**Sent:** Wednesday, March 16, 2011 4:14 PM  
**To:** LIA11 Hoc  
**Subject:** RE: fault map with reactors

**Categories:** FOIA, Red Category

As long as they know it's draft. I left a print out of the map Allen did as well. The layers can be changed if desired, to show different features, such as highways, rivers, etc. instead of Federal lands.

Ted

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 3:52 PM  
**To:** Smith, Theodore  
**Subject:** RE: fault map with reactors

So can I share this with the person who asked for it? I will just tell him it is draft.

---

**From:** Smith, Theodore  
**Sent:** Wednesday, March 16, 2011 3:51 PM  
**To:** LIA11 Hoc  
**Subject:** RE: fault map with reactors

It's draft.....

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 3:50 PM  
**To:** Smith, Theodore; Gross, Allen  
**Subject:** RE: fault map with reactors

Thanks!!

---

**From:** Smith, Theodore  
**Sent:** Wednesday, March 16, 2011 3:40 PM  
**To:** Gross, Allen; LIA11 Hoc  
**Subject:** FW: fault map with reactors

fyi

---

**From:** Seber, Dogan  
**Sent:** Wednesday, March 16, 2011 3:38 PM  
**To:** Munson, Clifford  
**Cc:** Smith, Theodore; Karas, Rebecca; Chokshi, Niles; Kammerer, Annie; Ake, Jon; Manoly, Kamal  
**Subject:** RE: fault map with reactors

Cliff,

The attached is the first attempt. The maps show the existing NPPs relative to the USGS active faults and folds (shaded areas). Two versions are provided one with plant names, and one without the names for clarity purposes. Please let me know if these suffice.

Dogan

---

**From:** Munson, Clifford

**Sent:** Wednesday, March 16, 2011 2:32 PM

**To:** Seber, Dogan

**Cc:** Smith, Theodore; Karas, Rebecca; Chokshi, Nilesh; Kammerer, Annie; Ake, Jon; Manoly, Kamal

**Subject:** fault map with reactors

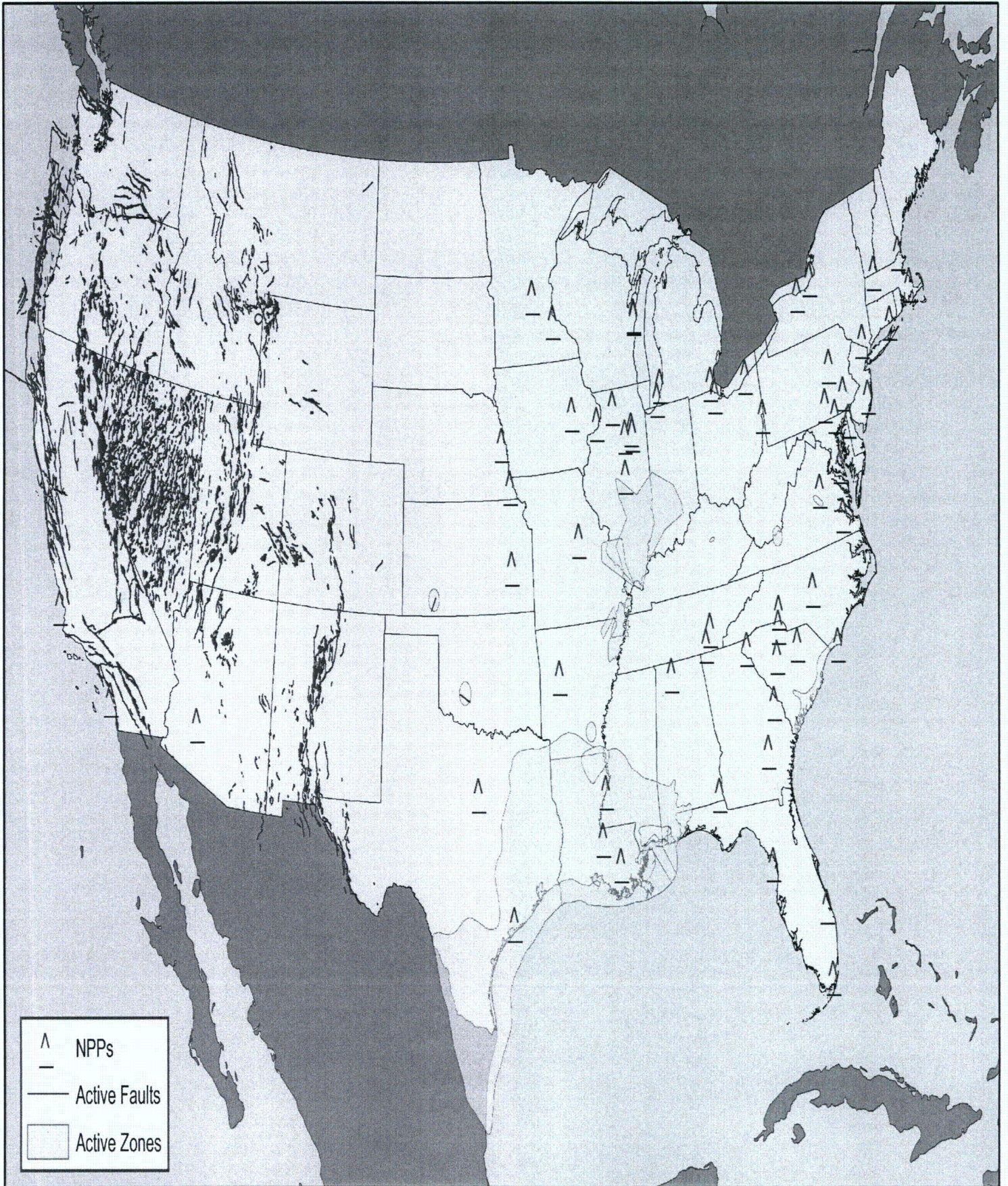
Dogan,

Would you please start working on a map that has the reactor locations together with faults from the USGS fault and fold database. Let me know if this is feasible and how long you think it will take.

Thanks,  
Cliff







---

**From:** OST04 Hoc  
**Sent:** Wednesday, March 16, 2011 8:38 PM  
**To:** LIA07 Hoc  
**Subject:** RE: Statement by U.S. Ambassador John V. Roos  
**Attachments:** TEPCO Press Release 37.pdf

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**From:** LIA07 Hoc  
**Sent:** Wednesday, March 16, 2011 8:29 PM  
**To:** OST04 Hoc  
**Subject:** FW: Statement by U.S. Ambassador John V. Roos

---

**From:** RMTFACTSU\_ELNRC [mailto:RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Wednesday, March 16, 2011 3:52 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc; LIA08 Hoc; Harrington, Holly; McIntyre, David; Buñnell, Scott; Marshall, Jane; Grant, Jeffery  
**Subject:** Statement by U.S. Ambassador John V. Roos

**Subject:** Statement Issued by U.S. Embassy Tokyo  
State Department Press Corps:

Following is a statement being issued by U.S. Embassy Tokyo now.

Press Office  
U.S. Department of State

U.S. Embassy  
Tokyo, Japan

March 16, 2011

Statement by U.S. Ambassador John V. Roos

The United States Nuclear Regulatory Commission (NRC), the Department of Energy and other technical experts in the U.S. Government have reviewed the scientific and technical information they have collected from assets in country, as well as what the Government of Japan has disseminated, in response to the deteriorating situation at the Fukushima Nuclear Power Plant. Consistent with the NRC guidelines that apply to such a situation in the United States, we are recommending, as a precaution, that American citizens who live within 50 miles (80 kilometers) of the Fukushima Nuclear Power Plant evacuate the area or to take shelter indoors if safe evacuation is not practical.

We want to underscore that there are numerous factors in the aftermath of the earthquake and Tsunami, including weather, wind direction and speed, and the nature of the reactor problem that affect the risk of radioactive contamination within this 50 mile (80 km) radius or the possibility of lower-level radioactive materials reaching greater distances.

The U.S. Embassy will continue to update American citizens as the situation develops. U.S. citizens in need of emergency assistance should send an e-mail to [JapanEmergencyUSC@state.gov](mailto:JapanEmergencyUSC@state.gov) with detailed information about their location and contact information, and monitor the U.S. Department of State website at [travel.state.gov](http://travel.state.gov).

The United States is continuing to do everything in its power to help Japan and American citizens who were there at the time of these tragic events. To support our citizens there, the Embassy is working around the clock, we have our consular services available 24 hours a day to determine the whereabouts and well-being of all U.S. citizens in Japan and we have offered our Japanese friends includes disaster response experts, search and rescue teams, technical advisers with nuclear expertise and logistical support from the United States military.

---

**From:** RMTFACTSU\_ELNRC <RMTFACTSU\_ELNRC@ofda.gov>  
**Sent:** Wednesday, March 16, 2011 3:36 PM  
**To:** LIA11 Hoc; LIA11 Hoc; LIA07 Hoc; LIA08 Hoc; LIA02 Hoc; Harrington, Holly; Burnell, Scott; McIntyre, David; Marshall, Jane; Gott, William; Marshall, Jane  
**Subject:** (SBU) 03.16.11 - USAID Administrator's Report on the Japan Earthquake and Tsunami #6  
**Attachments:** (SBU) 03.16.11 - USAID Admin Report on Japan EQ and Tsunami #6.pdf  
**Categories:** FOIA, Red Category

**Subject:** (SBU) 03.16.11 - USAID Administrator's Report on the Japan Earthquake and Tsunami #6

Please find attached and pasted below the Administrator's Report on the Japan Earthquake and Tsunami #6, dated March 16, 2011. ~~Information in this document is sensitive but unclassified (SBU) and designated for internal U.S. Government use only; please handle accordingly.~~

If you experience formatting issues in the text below, please refer to the attached document.

If you would like to be added to or removed from this distribution list, please email [rmtfactsu\\_inc@ofda.gov](mailto:rmtfactsu_inc@ofda.gov).

## Japan Earthquake and Tsunami Humanitarian Update #6 March 16, 2011

(b)(5)

(b)(5)

(b)(5)

**Diedra Spencer and Helen Ho**

*Information Coordinators*

Japan Earthquake and Pacific Tsunami Response Management Team

202-712-0039

[rmtpactsu\\_inc@ofda.gov](mailto:rmtpactsu_inc@ofda.gov)

(b)(5)



**USAID**  
FROM THE AMERICAN PEOPLE

## Administrator's Report

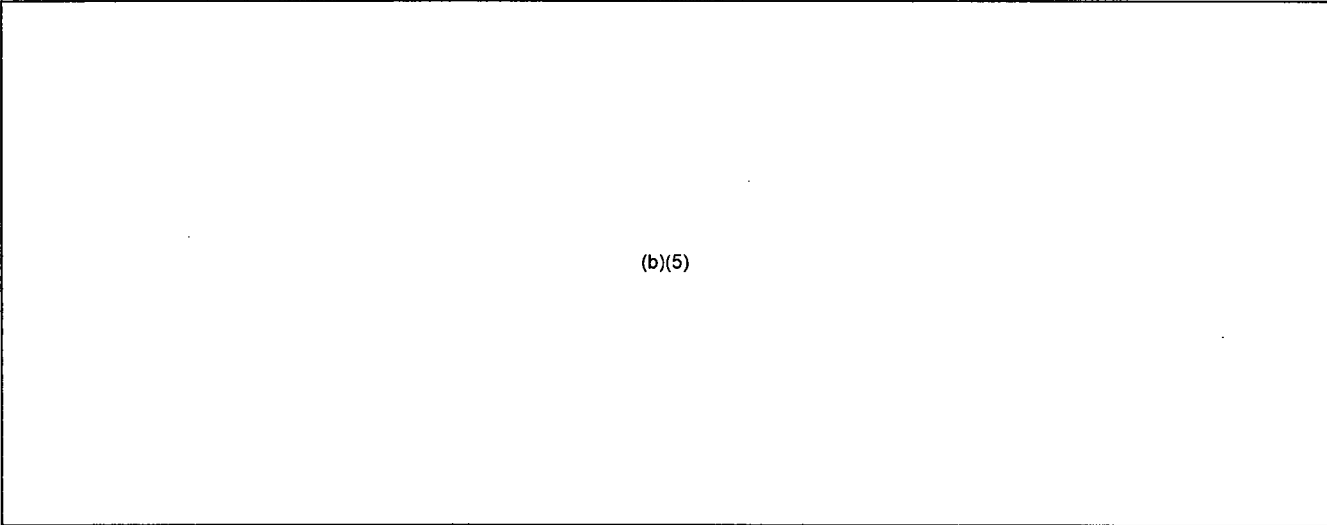
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### Japan Earthquake and Tsunami Humanitarian Update #6 March 16, 2011

(b)(5)



(b)(5)



(b)(5)

(b)(5)

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**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 3:30 PM  
**To:** LIA07 Hoc  
**Subject:** Two more names for distro list

**Categories:** FOIA

(b)(6)

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 3:29 PM  
**To:** (b)(6)  
**Subject:** Latest SITREP  
**Attachments:** USNRC Earthquake-Tsunami Update.031611.1400EDT.DOCX  
  
**Categories:** FOIA

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 3:21 PM  
**To:** LIA07 Hoc  
**Subject:** Add to Distro...Please

**Categories:** FOIA

(b)(6)

[steven.buntman@nssa.doe.gov](mailto:steven.buntman@nssa.doe.gov)  
[warren.t.cluff@cbp.dhs.gov](mailto:warren.t.cluff@cbp.dhs.gov)

(b)(6)  
[nitops@nssa.doe.gov](mailto:nitops@nssa.doe.gov)

---

**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Wednesday, March 16, 2011 2:58 PM  
**To:** Marshall, Jane; LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc  
**Subject:** FW: JLOC Contact Information

**Categories:** FOIA, Red Category

These are the folks to contact for the boron shipment

-----Original Message-----

From: RMTPACTSU\_DoDJCS  
Sent: Wednesday, March 16, 2011 2:38 PM  
To: RMTPACTSU\_ELNRC  
Subject: JLOC Contact Information

The Phone number for the Joint Logistics Operations Center (JLOC) which is a sub-element of the National Joint Operations and Intelligence Center (NJOIC) is 703-697-0744. Their email is [REDACTED] (b)(6) The JLOC is has personnel on duty 24 hours per day.

They will assist with flight information and help track down a POC at Vandenberg AFB.

The battle captain on duty right now (until 1800) is LT Nate Hayward.

V/R,  
LTC Brown

Douglas W. Brown  
LTC, USA  
DOD JCS LNO to USAID  
Black Berry #: [REDACTED] (b)(6)  
Email: [RMTLibyaCE\\_DoDJCS@ofda.gov](mailto:RMTLibyaCE_DoDJCS@ofda.gov)

-----Original Message-----

From: RMTPACTSU\_DoDJCS [mailto:RMTPACTSU\_DoDJCS@ofda.gov]  
Sent: Wednesday, March 16, 2011 1:35 PM  
To: NJOIC JLOC OFFICER JCS J3  
Subject: JLOC Phone Number

My memory is bad...what is the JLOC phone number?

Once received, you will be receiving an email or telephone call requesting information on a flight from Vandenberg AFB. I think you will be able to look it up on SMS....but they also want a POC at Vandenberg.

Thanks,

LTC Brown

---

**Subject:** HHS conference call: Screening of passengers from Japan  
**Location:** Dial-in: 877-700-1237, Passcode: (b)(6)  
**Start:** Wed 3/16/2011 4:00 PM  
**End:** Wed 3/16/2011 5:00 PM  
**Recurrence:** (none)  
**Meeting Status:** Accepted  
**Organizer:** OS Secretarys Operations Center  
**Categories:** FOIA

ALCON,

HHS is holding a conference call at 1600EDT on 16Mar11 regarding the screening or potential screening of incoming passengers on flights from Japan. Discussion may also include the screening of pets, as well as cargo screening. Please be prepared to speak for your respective agencies.

Dial-in information: 877-700-1237

Passcode: (b)(6)

The HHS Secretary's Operations Center can be reached at 202-619-7800.



---

**From:** Mail Delivery System <[redacted] (b)(6)>  
**Sent:** Wednesday, March 16, 2011 2:50 PM  
**To:** prvs=049ddb516=LIA11.Hoc@nrc.gov  
**Subject:** Undelivered Mail Returned to Sender  
**Attachments:** ATT00002..txt; Delivery report; Undelivered Message

**Categories:** FOIA, Red Category

This is an automated message from the Extensible Content Security at host [redacted] (b)(6)

The message returned below could not be delivered to its intended destinations.

For further assistance, please send mail to [redacted] (b)(6)

If you do so, please include this problem report. You can delete your own text from the message returned below.

Reason:

<[redacted] (b)(6) >: host 192.168.9.20[192.168.9.20]  
said: 550 5.1.1  
<[redacted] (b)(6) >... User unknown (in reply to RCPT  
TO command)

Attachment Delivery report(503 bytes ) cannot be converted to PDF format.

Attachment Delivery report(503 bytes ) cannot be converted to PDF format.

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 2:49 PM  
**To:** (b)(6)  
**Subject:** FW: Last two SITREPS

**Categories:** FOIA

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 2:49 PM  
**To:** (b)(6)  
**Subject:** FW: Last two SITREPS

---

**From:** Mail Delivery System [mailto:MAILER-DAEMON@mail2.nrc.gov]  
**Sent:** Wednesday, March 16, 2011 2:46 PM  
**To:** LIA11 Hoc  
**Subject:** Undeliverable: Last two SITREPS

**Delivery has failed to these recipients or distribution lists:**

(b)(6)

An error occurred while trying to deliver this message to the recipient's e-mail address. Microsoft Exchange will not try to redeliver this message for you. Please try resending this message, or provide the following diagnostic text to your system administrator.

**Diagnostic information for administrators:**

Generating server: mail2.nrc.gov

(b)(6)

# < #5.0.0 smtp; 5.1.2 - Bad destination host 'DNS Hard Error looking up nmic.mil (A): domain has no A record' (delivery attempts: 0)> #SMTP#

Original message headers:

Received: from twms01.nrc.gov ([148.184.200.145]) by mail2-private.nrc.gov with ESMTP; 16 Mar 2011 14:45:31 -0400

X-fn: SITREP 0315 @0600.docx, USNRC Earthquake-Tsunami Update.031611.1400EDT.DOCX  
X-IronPort-AV: E=Sophos;i="4.63,195,1299474000";  
d="xml?rels?docx'72,48?scan'72,48,208,217,72,48";a="36099286"  
Received: from HQCLSTR01.nrc.gov ([148.184.44.79]) by TWMS01.nrc.gov  
([148.184.200.145]) with mapi; Wed, 16 Mar 2011 14:45:31 -0400  
From: LIA11 Hoc <LIA11.Hoc@nrc.gov>

To: (b)(6)

Date: Wed, 16 Mar 2011 14:45:29 -0400  
Subject: Last two SITREPS  
Thread-Topic: Last two SITREPS  
Thread-Index: AcvkCIKXcCq6uKXRT2aFNnuHMEJWXQ==  
Message-ID: <CC56DD79EC73A545B9890C3C629E307D94861310EA@HQCLSTR01.nrc.gov>  
Accept-Language: en-US  
Content-Language: en-US  
X-MS-Has-Attach: yes  
X-MS-TNEF-Correlator:  
acceptlanguage: en-US  
Content-Type: text/plain  
MIME-Version: 1.0

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 2:45 PM  
**To:** (b)(6)  
**Subject:** Last two SITREPS  
**Attachments:** SITREP 0315 @0600.docx; USNRC Earthquake-Tsunami Update.031611.1400EDT.DOCX  
**Categories:** FOIA

PO Young,

Please see attached for the latest two SITREPs from today. As requested I will be adding your office to the distribution list. Also you asked about classified information that we have sent out, we have not sent any classified material out to anyone. The classified e-mail address for the NRC is [hoo1@nrc.sgov.gov](mailto:hoo1@nrc.sgov.gov).

Beth Reed  
Federal Liaison Desk  
301-816-5208

---

**From:** HOO Hoc  
**Sent:** Wednesday, March 16, 2011 3:58 PM  
**To:** OST01 HOC; OST02 HOC; OST03 HOC  
**Subject:** FW: Information regarding a device that could assist recovering Spent Fuel Pool cooling and inventory at the Japanese Plants  
**Attachments:** image001.jpg

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



---

**From:** Sabisch, Andrew  
**Sent:** Wednesday, March 16, 2011 3:58 PM  
**To:** Bartley, Jonathan; HOO Hoc; OPA Resource  
**Cc:** Croteau, Rick; Jones, William  
**Subject:** RE: Information regarding a device that could assist recovering Spent Fuel Pool cooling and inventory at the Japanese Plants

We have a video of the device in operation if anyone is interested in seeing it . . . . . the B.5.b team was favorably impressed with the uniqueness of the device and how simple it is.

Andy Sabisch  
Oconee SRI

---

**From:** Bartley, Jonathan  
**Sent:** Wednesday, March 16, 2011 2:28 PM  
**To:** HOO Hoc; OPA Resource  
**Cc:** Sabisch, Andrew; Croteau, Rick; Jones, William  
**Subject:** Information regarding a device that could assist recovering Spent Fuel Pool cooling and inventory at the Japanese Plants  
**Importance:** High

Attached is a document that describes a device that Duke developed as a B.5.b strategy for providing cooling to the spent fuel pools after a catastrophic event. Please contact Andy Sabisch, Oconee SRI, if you have any questions or need a POC at Duke to discuss the device.

---

**From:** Sabisch, Andrew  
**Sent:** Wednesday, March 16, 2011 1:40 PM  
**To:** Bartley, Jonathan  
**Subject:** Information regarding a device that could assist recovering Spent Fuel Pool cooling and inventory



Please review this

=====

**Andrew T. Sabisch**  
U.S. Nuclear Regulatory Commission  
Senior Resident Inspector  
Oconee Nuclear Station  
Seneca, SC 29678  
(O) 864-882-6927/6928  
(F) 864-882-0189  
(C) (b)(6)

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 2:22 PM  
**To:** LIA04 Hoc  
**Subject:** FW: JAPAN Statement is out

-----Original Message-----

**From:** Burnell, Scott  
**Sent:** Wednesday, March 16, 2011 1:55 PM  
**To:** LIA11 Hoc; Batkin, Joshua  
**Subject:** FW: JAPAN Statement is out

FYI

-----Original Message-----

**From:** Hammer, Michael A [mailto:HammerMA@state.gov]  
**Sent:** Wednesday, March 16, 2011 1:35 PM  
**To:** Hammer, Michael A; Shapiro, Nicholas S.; Lapan, David COL OSD PA; Leistikow, Dan; Brenner, Eliot; Wilson, Douglas HON OSD PA; Harrington, Holly; Burnell, Scott; Poneman, Daniel; Sheehan, Neil; Whitman, Bryan SES OSD PA  
**Cc:** Jensen, Robert R.; Klevorick, Caitlin B; TaskForce-1  
**Subject:** JAPAN Statement is out

NRC - you have a go sign

U.S. Embassy  
Tokyo, Japan

March 16, 2011

Statement by U.S. Ambassador John V. Roos

The United States Nuclear Regulatory Commission (NRC), the Department of Energy and other technical experts in the U.S. Government have reviewed the scientific and technical information they have collected from assets in country, as well as what the Government of Japan has disseminated, in response to the deteriorating situation at the Fukushima Nuclear Power Plant. Consistent with the NRC guidelines that apply to such a situation in the United States, we are recommending, as a precaution, that American citizens who live within 50 miles (80 kilometers) of the Fukushima Nuclear Power Plant evacuate the area or to take shelter indoors if safe evacuation is not practical.

We want to underscore that there are numerous factors in the aftermath of the earthquake and Tsunami, including weather, wind direction and speed, and the nature of the reactor problem that affect the risk of radioactive contamination within this 50 mile (80 km) radius or the possibility of lower-level radioactive materials reaching greater distances.

The U.S. Embassy will continue to update American citizens as the situation develops. U.S. citizens in need of emergency assistance should send an e-mail to [JapanEmergencyUSC@state.gov](mailto:JapanEmergencyUSC@state.gov) with detailed information about their location and contact information, and monitor the U.S. Department of State website at [travel.state.gov](http://travel.state.gov).

The United States is continuing to do everything in its power to help Japan and American citizens who were there at the time of these tragic events. To support our citizens there, the Embassy is working around the clock, we have our consular services available 24 hours a day to determine the whereabouts and well-being of all U.S. citizens in Japan and we have offered our Japanese friends assistance, including disaster response experts, search and rescue teams, technical advisers with nuclear expertise and logistical support from the United States military.

This email is UNCLASSIFIED

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 2:09 PM  
**To:** Kozal, Jason  
**Subject:** RE: Today's 2:00 Congressional Call

**Categories:** FOIA

Yes they got it, thanks

---

**From:** Kozal, Jason  
**Sent:** Wednesday, March 16, 2011 2:07 PM  
**To:** LIA11 Hoc  
**Subject:** Re: Today's 2:00 Congressional Call

Did you get the call in info from mike?

Sent from an NRC BlackBerry  
Jason W Kozal

(b)(6)

---

**From:** LIA11 Hoc  
**To:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Cc:** (b)(6); Kozal, Jason  
**Sent:** Wed Mar 16 14:03:41 2011  
**Subject:** RE: Today's 2:00 Congressional Call

Do you have call in info for this call?

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Wednesday, March 16, 2011 10:44 AM  
**To:** Harrington, Holly; Burnell, Scott; LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc; LIA08 Hoc; McIntyre, David  
**Subject:** Today's 2:00 Congressional Call

I just got out of a meeting with USAID administrators and they felt that today's 2:00 was once again a priority. They requested a name of the NRC person that will support so that they can advertise.

Do we know who will support from the NRC?

Thanks!  
Michael I. Dudek

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 2:05 PM  
**To:** Hoc, PMT12  
**Subject:** CBP Request

**Categories:** FOIA

DHS-CBP has a request for assistance in developing guidance for handling contaminated cargo coming off planes originating from Japan.

---

**From:** Harrington, Holly  
**Sent:** Wednesday, March 16, 2011 1:48 PM  
**To:** LIA11 Hoc  
**Subject:** Pls call

**Categories:** FOIA, Red Category

Walter Collins  
DHS – NCS  
703-235-5080  
Confirm radiation model we are using regarding Japan

---

**From:** Harrington, Holly  
**Sent:** Wednesday, March 16, 2011 1:24 PM  
**To:** LIA11 Hoc  
**Subject:** RE: Is someone from the Ops Center handling other fed calls - this is from the Air Force - but no phone #

**Categories:** FOIA, Red Category

No, just e-mail below

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 1:18 PM  
**To:** Harrington, Holly  
**Subject:** RE: Is someone from the Ops Center handling other fed calls - this is from the Air Force - but no phone #

Was there a document attached to this, because nothing came through.

---

**From:** Harrington, Holly  
**Sent:** Wednesday, March 16, 2011 1:16 PM  
**To:** LIA11 Hoc  
**Subject:** FW: Is someone from the Ops Center handling other fed calls - this is from the Air Force - but no phone #

Here you go

---

**From:** Landau, Mindy  
**Sent:** Wednesday, March 16, 2011 1:13 PM  
**To:** Harrington, Holly  
**Subject:** Is someone from the Ops Center handling other fed calls - this is from the Air Force - but no phone #

Todd Spittler  
Secretary Airforce Public Affairs  
Re: Document 11-04 on March 15 – NRC Analyses

Mindy S. Landau  
Deputy Assistant for Operations  
Communication and Performance Improvement  
Office of the Executive Director for Operations  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555  
301-415-8703  
[mindy.landau@nrc.gov](mailto:mindy.landau@nrc.gov)

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 1:20 PM  
**To:** RMTFACTSU\_ELNRC  
**Subject:** FW: 0100 SPEEDI Data  
**Attachments:** FUKUSHIMA1 air concentrationüi03-04hüj.gif; FUKUSHIMA1 air concentrationüi01-02hüj.gif; FUKUSHIMA1 air doseüi01-02hüj.gif; FUKUSHIMA1 air doseüi02-03hüj.gif; FUKUSHIMA1 air doseüi03-04hüj.gif; FUKUSHIMA1 wind(01hüj.gif; FUKUSHIMA1 air concentrationüi02-03hüj.gif

**Categories:** FOIA

-----Original Message-----

**From:** HOO Hoc  
**Sent:** Wednesday, March 16, 2011 1:09 PM  
**To:** ET07 Hoc; OST02 HOC; PMT01 Hoc; RST01 Hoc; LIA01 Hoc; LIA02 Hoc; LIA04 Hoc; LIA07 Hoc; LIA11 Hoc; LIA12 Hoc; Gott, William; Marshall, Jane; McDermott, Brian; Morris, Scott; Thorp, John  
**Subject:** FW: 0100 SPEEDI Data

-----Original Message-----

**From:** JapanEmbassy, TaskForce [mailto:JapanEmbassyTaskForce@state.gov]  
**Sent:** Wednesday, March 16, 2011 1:05 PM

**To:** (b)(6)

(b)(6)

**Subject:** 0100 SPEEDI Data

SPEEDI Data for 0100, unzipped.

SBU

This email is UNCLASSIFIED

Jerome Ryan  
Political Officer  
U.S. Embassy Tokyo  
1-10-5, Akasaka 1-Chome, Minato-Ku, Tokyo 107  
tel:(81)(03)3224-5343  
fax:(81)(03)3224-5322  
<http://japan.usembassy.gov/>



-----Original Message-----

From: nustec [mailto:spd01@nustec.or.jp]

Sent: Thursday, March 17, 2011 1:32 AM

To: [REDACTED] (b)(6)

[REDACTED] (b)(6)

Subject: 01時SPEEDI単位量放出図形イメージの送付

関係者各位

お世話になっております。

原子力安全技術センター 鬼島です。

3/17 01時のSPEEDI単位量放出図形のイメージデータを送付致します。

ご確認のほど、よろしくお願い致します。

---

**From:** Burnell, Scott  
**Sent:** Wednesday, March 16, 2011 1:32 PM  
**To:** Akstulewicz, Brenda; Harrington, Holly  
**Subject:** LATEST REVISION!! Press Release PDF 16 March 2010 02  
**Attachments:** 11\_16\_evac.docx

**Importance:** High

SORRY!!!

THIS is the latest change to language – boilerplate at end per Eliot. The PDFs remain as before.

---

**From:** PMT02 Hoc  
**Sent:** Wednesday, March 16, 2011 1:08 PM  
**To:** Burnell, Scott; Coggins, Angela; (b)(6) Jones, Cynthia; Brenner, Eliot  
**Cc:** cmht@nnsa.doe.gov; narac@lnl.gov; HOO Hoc; LIA11 Hoc  
**Subject:** Press Release PDF 16 March 2010 02

Attached as requested by the NRC Chairman is the PDF version of the NRC Protective Measures Team (PMT) dose estimates that support the NRC and State Department press release to expand the evacuation zone to 50 miles. The Chairman received approval from White House (WH) John Brennan and NNSA Tom D'Augustino. NRC PMT also conferred with NARAC and WH COL Julie Bentz in confirming the release of this information to the public. It is our understanding that NRC's Office of Public Affairs will attach this PDF containing dose projections to their next press release.

Protective Measures Team  
NRC Operations Center  
301-816-5100

# OPA

## D R A F T PRESS RELEASE

(Source: CHRMN )

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### **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.

###

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<br>miles<br>(kilometers) | 0.5            | 1.             | 1.5            | 2.             | 3.             | 5.             | 7.             | 10.            |
|--------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                            | (0.8)          | (1.61)         | (2.41)         | (3.22)         | (4.83)         | (8.05)         | (11.27)        | (16.09)        |
| Total EDE                                  | <u>5.4E+03</u> | <u>2.0E+03</u> | <u>1.2E+03</u> | <u>8.2E+02</u> | <u>4.8E+02</u> | <u>2.4E+02</u> | <u>1.6E+02</u> | <u>9.5E+01</u> |
| Thyroid CDE                                | <u>2.8E+04</u> | <u>1.1E+04</u> | <u>6.2E+03</u> | <u>4.3E+03</u> | <u>2.5E+03</u> | <u>1.3E+03</u> | <u>8.4E+02</u> | <u>5.1E+02</u> |
| Inhalation CEDE                            | <u>3.7E+03</u> | <u>1.4E+03</u> | <u>8.0E+02</u> | <u>5.6E+02</u> | <u>3.3E+02</u> | <u>1.7E+02</u> | <u>1.1E+02</u> | <u>6.7E+01</u> |
| 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                         | <u>2.4E+04</u> | <u>9.4E+03</u> | <u>5.4E+03</u> | <u>3.8E+03</u> | <u>2.2E+03</u> | <u>1.1E+03</u> | <u>6.6E+02</u> | <u>3.9E+02</u> |
| Inter Phase 2nd Yr                         | <u>1.1E+04</u> | <u>4.4E+03</u> | <u>2.6E+03</u> | <u>1.8E+03</u> | <u>1.0E+03</u> | <u>4.9E+02</u> | <u>3.1E+02</u> | <u>1.8E+02</u> |

Notes:

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

### Maximum Dose Values (rem) - To 50 mi

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

Notes:

- 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<br>miles<br>(kilometers) | 0.5<br>(0.8)   | 1.<br>(1.61)   | 1.5<br>(2.41)  | 2.<br>(3.22)   | 3.<br>(4.83)   | 5.<br>(8.05)   | 7.<br>(11.27)  | 10.<br>(16.09) |
|--------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Total EDE                                  | <u>5.4E+03</u> | <u>1.5E+03</u> | <u>6.7E+02</u> | <u>3.9E+02</u> | <u>1.8E+02</u> | <u>7.5E+01</u> | <u>4.0E+01</u> | <u>1.4E+01</u> |
| Thyroid CDE                                | <u>2.9E+04</u> | <u>7.9E+03</u> | <u>3.6E+03</u> | <u>2.1E+03</u> | <u>9.6E+02</u> | <u>4.0E+02</u> | <u>2.1E+02</u> | <u>7.5E+01</u> |
| Inhalation CEDE                            | 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                         | <u>2.6E+04</u> | <u>7.0E+03</u> | <u>3.2E+03</u> | <u>1.9E+03</u> | <u>8.5E+02</u> | <u>3.6E+02</u> | <u>1.9E+02</u> | <u>7.5E+01</u> |
| Inter Phase 2nd Yr                         | <u>1.3E+04</u> | <u>3.5E+03</u> | <u>1.6E+03</u> | <u>9.2E+02</u> | <u>4.2E+02</u> | <u>1.8E+02</u> | <u>9.5E+01</u> | <u>3.8E+01</u> |

#### Notes:

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

### Maximum Dose Values (rem) - To 50 mi

| Dist from release<br>miles<br>(kilometers) | 15<br>(24.1)   | 20<br>(32.2)   | 30<br>(48.3)   | 40<br>(64.4)   | 50<br>(80.5)   |
|--------------------------------------------|----------------|----------------|----------------|----------------|----------------|
| Total EDE                                  | <u>1.5E+01</u> | <u>1.3E+01</u> | <u>1.1E+01</u> | <u>1.0E+01</u> | <u>9.9E+00</u> |
| Thyroid CDE                                | <u>8.6E+01</u> | <u>7.0E+01</u> | <u>5.2E+01</u> | <u>4.9E+01</u> | <u>4.8E+01</u> |
| 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                         | <u>7.1E+01</u> | <u>6.0E+01</u> | <u>4.7E+01</u> | <u>4.5E+01</u> | <u>4.3E+01</u> |
| Inter Phase 2nd Yr                         | <u>3.6E+01</u> | <u>3.0E+01</u> | <u>2.3E+01</u> | <u>2.2E+01</u> | <u>2.1E+01</u> |

#### 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

T EDE - Total Effective Dose Equivalent

CDE - Committed Dose Equivalent

CEDE - Committed Effective Dose Equivalent

PAGs - Protective Action Guidelines

EPA - Environmental Protection Agency

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 1:04 PM  
**To:** steven.buntman@nnsa.doe.gov  
**Subject:** FW: IMMEDIATE

**Categories:** FOIA

-----Original Message-----

From: Burnell, Scott  
Sent: Wednesday, March 16, 2011 1:03 PM  
To: LIA11 Hoc  
Subject: RE: IMMEDIATE

ALL LANGUAGE BELOW NOT SUBJECT TO REVISION AND OFFICIAL USE ONLY PRIOR TO STATE DEPARTMENT AND NRC RELEASE

DOS:

In response to the deteriorating situation at the Fukushima Nuclear Power Plant, the United States Nuclear Regulatory Commission (NRC), the Department of Energy and other technical experts in the U.S. Government have reviewed the scientific and technical information they have collected from assets in country, as well as what the Government of Japan has disseminated. Consistent with the NRC guidelines that would apply to such a situation in the United States, we are recommending, as a precaution, that American citizens who live within 50 miles (80 kilometers) of the Fukushima Nuclear Power Plant evacuate the area or to take shelter indoors if safe evacuation is not practical.

We want to underscore that there are numerous factors in the aftermath of the earthquake and Tsunami, including weather, wind direction and speed, and the nature of the reactor problem that affect the risk of radioactive contamination within this 50 mile radius or the possibility of lower-level radioactive materials reaching greater distances.

The U.S. Embassy will continue to update American citizens as the situation develops. U.S. citizens in need of emergency assistance should send an e-mail to [JapanEmergencyUSC@state.gov](mailto:JapanEmergencyUSC@state.gov) with detailed information about their location and contact information, and monitor the U.S. Department of State website at [travel.state.gov](http://travel.state.gov).

The United States is continuing to do everything in its power to help Japan and American citizens who were there at the time of these tragic events. To support our citizens there, the Embassy is working around the clock, we have our consular services available 24 hours a day to determine the whereabouts and well-being of all U.S. citizens in Japan and we have offered our Japanese friends includes disaster response experts, search and rescue teams, technical advisers with nuclear expertise and logistical support from the United States military.

NRC:

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.



---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 12:36 PM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** FW: Information Sheet Regarding the Fukushima and Rokkasho  
**Attachments:** Update to Information Sheet 11.03.16.doc  
  
**Categories:** FOIA

---

**From:** HOO Hoc  
**Sent:** Wednesday, March 16, 2011 12:35 PM  
**To:** ET07 Hoc; OST02 HOC; PMT01 Hoc; RST01 Hoc; LIA01 Hoc; LIA02 Hoc; LIA04 Hoc; LIA07 Hoc; LIA11 Hoc; LIA12 Hoc; Gott, William; Marshall, Jane; McDermott, Brian; Morris, Scott; Thorp, John  
**Subject:** FW: Information Sheet Regarding the Fukushima and Rokkasho

---

**From:** Hiltz, Thomas  
**Sent:** Wednesday, March 16, 2011 12:34 PM  
**To:** Tschiltz, Michael; Bailey, Marissa; Kinneman, John; Haney, Catherine; Dorman, Dan; HOO Hoc  
**Subject:** FW: Information Sheet Regarding the Fukushima and Rokkasho

FYI

---

**From:** Kazuhiko Hiruta [mailto:Hiruta@denjiren.com]  
**Sent:** Wednesday, March 16, 2011 11:04 AM  
**To:** Kazuhiko Hiruta  
**Subject:** Information Sheet Regarding the Fukushima and Rokkasho

Dear friends,

Please find information about the incidents at Fukushima Nuclear Power Station and Rokkasho. If you have questions, please feel free to contact me.

Best regards,  
Kazu

=====  
**Kazuhiko HIRUTA**  
**FEPC Washington Office**  
"The Federation of Electric Power Companies of Japan"  
1901 L Street NW Suite 600 Washington, DC 20036  
tel: 202-466-3507  
cell: (b)(6)  
fax: 202-466-6758  
=====

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**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 12:33 PM  
**To:** steven.buntman@nnsa.doe.gov  
**Subject:** FW: Your Request - Organization of Interagency People In Japan  
**Attachments:** PAC TSU Response Org Charts\_03 15 2011.pptx  
  
**Categories:** FOIA

FYI

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**From:** RMTFACTSU\_ELNRC [mailto:RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Wednesday, March 16, 2011 12:22 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc; LIA08 Hoc; Harrington, Holly; McIntyre, David; Burnell, Scott; Marshall, Jane  
**Subject:** Your Request - Organization of Interagency People In Japan

Per your request, I have enclosed an org chart on the who, what, and where the Interagency is deployed in Japan. According to the email below, there are 210 total people over there... and it is growing.

Please let me know if you need any additional questions or concerns.  
Michael I. Dudek

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**From:** RMTFACTSU\_DMO  
**Sent:** Wednesday, March 16, 2011 11:40 AM  
**To:** RMTFACTSU\_ELNRC  
**Subject:** FW: DART/RMT Org charts

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**From:** RMTFACTSU\_DMO  
**Sent:** Tuesday, March 15, 2011 10:11 PM  
**To:** DART\_FACTSU; RMT\_FACTSU  
**Cc:** SMT [USAID]  
**Subject:** DART/RMT Org charts

Dear DART and RMT,

As promised on the field call, attached please find the current org charts for the DART and RMT. I've also outlined a brief description of the scopes of work for the NRC, HHS, and DOE teams. NRC, HHS, and DOE team members...please feel free to correct me if I've misrepresented your mission.

**Total DART footprint: 210**

**USAID: 13 total**

**USAR: 144 total and 12 dogs** (this is the number we are reporting, even though we now have 143)

**NRC Team: 12 total**

The purpose of the NRC team is to monitor the technical aspects of the nuclear events unfolding in Japan, specifically engage with the Ambassador's staff and Japanese authorities to better understand the status of the nuclear reactors at Fukushima Daiichi, units 1, 2, and 3. The NRC team will be headed by Disaster Communications Specialist who is set to arrive Tokyo, 1:30 pm on Wednesday, 3/16. We are working on the travel for the remaining NRC staff.

**HHS Health Communications Team: 6 total**

The team is composed of six health communication specialists with expertise in CBRNE issues. The team will :

- Provide support to the DART earthquake and tsunami in Japan.
- Develop and coordinate the distribution of health and safety related messages to the population of Japan that has been impacted by the earthquake and tsunami.
- Locations within Japan may vary, but it is anticipated that 2 specialists will be based in Tokyo with additional specialists deployed to various consulates near the affected regions.

**DOE: 35 total**

The team had two primary components:

- Consequence Management (CM) –is DOE's emergency response team to protect the public's health and safety of a radiological dispersal that results in contamination to the environment. It includes: scientific data assessment and radiation monitoring; management, coordination, and liaison function; data management with GIS product development; health physics kit supporting contamination surveys; and low volume air sampling.
- Aerial Measuring System (AMS) - is DOE's aerial emergency response capability for mapping radiological material deposited on the ground. It includes: aerial radiation detection systems with capabilities for sensitive radiation mapping and high-radiation field surveys; equipment can be mounted on up to two aircraft simultaneously; and deploys with a self-contained analytic capability.

Chris Leonardo  
Deputy Manager for Operations  
Pacific Tsunami Response Management Team  
[RMTPACTSU\\_DMO@ofda.gov](mailto:RMTPACTSU_DMO@ofda.gov)  
202-712-0039

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**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 12:27 PM  
**To:** LIA02 Hoc  
**Cc:** RMTPACTSU\_ELNRC  
**Subject:** FW: Emergency Contact Information

**Categories:** FOIA

Skip along with the below request could you also determine if the NRC team in Japan established a rotation or watch bill?

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Wednesday, March 16, 2011 11:06 AM  
**To:** LIA11 Hoc  
**Cc:** Reed, Elizabeth  
**Subject:** Emergency Contact Information

Providing USAID with emergency contact information for NRC personnel on DART; however, we are missing information for Anthony Ulses. Can you please obtain and forward to use the following for Mr. Ulses:

- NAME (emergency contact)
- Phone (emergency contact)
- E-mail (emergency contact)

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**From:** PMT02 Hoc  
**Sent:** Thursday, March 17, 2011 1:45 AM  
**To:** narac@llnl.gov; cmht@nnsa.doe.gov  
**Cc:** Brandon, Lou; PMT11 Hoc; PMT02 Hoc  
**Subject:** ACTION: web access for LBrandon (USNRC)

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**From:** PMT02 Hoc  
**Sent:** Wednesday, March 16, 2011 12:09 PM  
**To:** PMT02 Hoc; narac@llnl.gov; nitops@nnsa.doe.gov  
**Cc:** cmht@nnsa.doe.gov; Brandon, Lou; 'pmt11.HOC@nrc.gov'  
**Subject:** RE: NRC RASCAL estimations

**--- THIS IS A MONITORING OPERATION FOR THE FUKUSHIMA REACTOR IN JAPAN ---**

**This is a MONITORING OPERATION FOR THE JAPAN EARTHQUAKE TSUNAMI AFTERMATH.**

Attached are eight files for the following four assumed source terms (.CSV and Case Summary files):

- Unit 2, 33% core melt, no containment, release as of 14MAR 2100 Z
- Unit2, 100% core melt, no containment, release as of 14MAR 2100 Z

-Unit 3, spent fuel pool, no containment, release as of 14MAR 0200 Z, based on one-third (180 bundles) core of fresh spent fuel off loaded Dec 1, 2010. We damaged all the fuel, since the RASCAL model does not allow us to perform percentage damage. In our previous run, we assumed only the fresh fuel was damaged.

-Unit 4, spent fuel pool, no containment, release as of 16MAR 19:50 Z, based on fresh fuel, full core (550 bundles) off load on Dec 1, 2010. We damaged all the fuel, since the RASCAL model does not allow us to perform percentage damage. In our previous run, we assumed only the fresh fuel was damaged. We used the time core uncovered option (instead of the spent fuel pool option) to melt a full core, since we couldn't model the entire spent fuel inventory. We are unable to include the old fuel in the pool, but our runs show that this source term would result in approximately 1% increase in dose.

NRC Protective Measures Team  
301-816-5419

**Please reply to this email to acknowledge receipt.**

**This information should not be released at this time.**

**NO PARTICIPATION OR RESPONSE BY CMHT IS EXPECTED**

**--- THIS IS A MONITORING OPERATION FOR THE FUKUSHIMA REACTOR IN JAPAN**

## Case Summary

**Event Type** Nuclear Power Plant

### Location

Name: Fukushima U4  
 City, county, state: <undefined>, <undefined>, <undefined>  
 Lat / Long / Elev: 37.4214° N, 141.0325° E, 0 m  
 UTC Offset: 9 hours  
 Population: not available

### Reactor Parameters

Reactor power: 2350 MWt  
 Average fuel burn-up: 50000 MWD / MTU  
 Containment type: BWR Mark I  
 Containment volume: 2.50E+05 ft<sup>3</sup>  
 Design pressure: 60 lb/in<sup>2</sup>  
 Design leak rate: 0.54 %/d  
 Coolant mass: 1.25E+05 kg  
 Assemblies in core: 550

### Source Term

Type: Time Core Is Uncovered  
 Shutdown: 2010/12/01 00:00  
 Core uncovered: 2011/03/16 19:50  
 Core recovered: No

### Release Pathway

Type: BWR - Release Through Dry Well  
 via direct, unfiltered pathway  
 Description: U4 Fukushima  
 Release height: 10. m

### Release events

2011/03/16 19:50 Leak rate (% vol) Total failure  
 2011/03/16 19:50 Sprays Off

### Meteorology

Type: Actual Observations  
 Dataset name: Fukushima 2011-03-16 0935  
 Dataset desc: Obs/fcsts for Fukushima Unit 1

| Summary of data<br>at release point: | Type | Dir<br>deg | Speed<br>m/s | Stab<br>class | Precip | Temp<br>°C |
|--------------------------------------|------|------------|--------------|---------------|--------|------------|
| 2011/03/12 14:00                     | Obs  | 265        | 1.0          | B             | ?      |            |
| 2011/03/12 15:00                     | Obs  | 265        | 1.0          | B             | ?      |            |
| 2011/03/12 16:00                     | Obs  | 277        | 1.3          | B             | ?      |            |
| 2011/03/12 17:00                     | Obs  | 260        | 2.4          | B             | ?      |            |
| 2011/03/12 18:00                     | Obs  | 241        | 1.4          | E             | ?      |            |
| 2011/03/12 19:00                     | Obs  | 236        | 2.1          | E             | ?      |            |
| 2011/03/12 20:00                     | Obs  | 239        | 2.1          | E             | ?      |            |
| 2011/03/12 21:00                     | Obs  | 229        | 3.8          | E             | ?      |            |
| 2011/03/12 22:00                     | Obs  | 224        | 5.1          | E             | ?      |            |
| 2011/03/12 23:00                     | Obs  | 226        | 3.9          | E             | ?      |            |
| 2011/03/13 00:00                     | Obs  | 228        | 4.1          | E             | ?      |            |
| 2011/03/13 01:00                     | Obs  | 235        | 2.6          | E             | ?      |            |
| 2011/03/13 02:00                     | Obs  | 233        | 3.9          | E             | ?      |            |
| 2011/03/13 03:00                     | Obs  | 225        | 1.8          | E             | ?      |            |
| 2011/03/13 04:00                     | Obs  | 225        | 1.3          | E             | ?      |            |
| 2011/03/13 05:00                     | Obs  | 225        | 2.2          | E             | ?      |            |
| 2011/03/13 06:00                     | Obs  | 225        | 2.2          | E             | ?      |            |

|                  |      |     |      |     |          |
|------------------|------|-----|------|-----|----------|
| 2011/03/13 07:00 | Obs  | 248 | 2.7  | E   | ?        |
| 2011/03/13 08:00 | Obs  | 248 | 2.7  | E   | ?        |
| 2011/03/13 09:00 | Obs  | 270 | 3.1  | E   | ?        |
| 2011/03/13 12:00 | Obs  | 271 | 7.4  | D   | ?        |
| 2011/03/13 13:00 | Obs  | 276 | 6.2  | D   | ?        |
| 2011/03/13 14:00 | Obs  | 312 | 2.8  | B   | ?        |
| 2011/03/14 18:00 | Obs  | 258 | 4.8  | unk | ?        |
| 2011/03/14 19:00 | Obs  | 268 | 5.0  | unk | ?        |
| 2011/03/14 20:00 | Obs  | 330 | 2.2  | unk | ?        |
| 2011/03/14 21:00 | Fcst | 337 | 4.6  | unk | ?        |
| 2011/03/14 22:00 | Fcst | 323 | 7.2  | unk | ?        |
| 2011/03/14 23:00 | Fcst | 305 | 6.6  | unk | ?        |
| 2011/03/15 00:00 | Fcst | 015 | 8.6  | unk | ?        |
| 2011/03/15 02:00 | Fcst | 002 | 7.5  | unk | ?        |
| 2011/03/15 03:00 | Fcst | 347 | 5.2  | E   | None     |
| 2011/03/15 04:00 | Fcst | 332 | 5.6  | E   | None     |
| 2011/03/15 05:00 | Fcst | 332 | 4.0  | E   | None     |
| 2011/03/15 06:00 | Fcst | 344 | 3.5  | E   | Lgt rain |
| 2011/03/15 07:00 | Fcst | 026 | 3.8  | E   | Lgt rain |
| 2011/03/15 08:00 | Fcst | 044 | 4.4  | E   | Lgt rain |
| 2011/03/15 09:00 | Fcst | 020 | 4.2  | E   | Lgt rain |
| 2011/03/15 10:00 | Fcst | 010 | 3.4  | E   | None     |
| 2011/03/15 11:00 | Fcst | 030 | 3.5  | D   | Lgt rain |
| 2011/03/15 12:00 | Fcst | 027 | 3.0  | D   | Lgt rain |
| 2011/03/15 13:00 | Fcst | 037 | 3.4  | D   | Lgt rain |
| 2011/03/15 14:00 | Fcst | 053 | 3.7  | B   | None     |
| 2011/03/15 15:00 | Fcst | 058 | 3.7  | B   | None     |
| 2011/03/15 16:00 | Fcst | 067 | 3.2  | C   | Lgt rain |
| 2011/03/15 17:00 | Fcst | 081 | 3.9  | C   | Lgt rain |
| 2011/03/15 18:00 | Fcst | 089 | 4.7  | B   | None     |
| 2011/03/15 19:00 | Fcst | 085 | 4.4  | B   | None     |
| 2011/03/15 20:00 | Fcst | 083 | 4.4  | B   | Lgt rain |
| 2011/03/15 21:00 | Fcst | 074 | 4.6  | C   | Lgt rain |
| 2011/03/15 22:00 | Fcst | 054 | 5.0  | D   | Lgt rain |
| 2011/03/15 23:00 | Fcst | 029 | 5.6  | D   | Rain     |
| 2011/03/16 00:00 | Fcst | 011 | 5.1  | D   | Lgt rain |
| 2011/03/16 01:00 | Fcst | 346 | 4.3  | C   | Lgt rain |
| 2011/03/16 02:00 | Fcst | 350 | 5.3  | D   | Lgt rain |
| 2011/03/16 03:00 | Fcst | 323 | 5.6  | D   | Lgt rain |
| 2011/03/16 04:00 | Fcst | 316 | 5.4  | D   | None     |
| 2011/03/16 05:00 | Fcst | 298 | 4.8  | D   | None     |
| 2011/03/16 06:00 | Fcst | 314 | 5.6  | D   | None     |
| 2011/03/16 07:00 | Fcst | 312 | 4.7  | D   | None     |
| 2011/03/16 08:00 | Fcst | 331 | 4.9  | D   | None     |
| 2011/03/16 09:00 | Fcst | 299 | 4.2  | D   | None     |
| 2011/03/16 10:00 | Fcst | 312 | 5.4  | C   | None     |
| 2011/03/16 11:00 | Fcst | 309 | 7.5  | C   | None     |
| 2011/03/16 12:00 | Fcst | 304 | 7.2  | C   | None     |
| 2011/03/16 13:00 | Fcst | 314 | 8.8  | C   | None     |
| 2011/03/16 14:00 | Fcst | 325 | 10.4 | C   | None     |
| 2011/03/16 15:00 | Fcst | 324 | 12.3 | C   | None     |
| 2011/03/16 16:00 | Fcst | 304 | 14.7 | D   | None     |
| 2011/03/16 17:00 | Fcst | 299 | 14.2 | D   | None     |
| 2011/03/16 18:00 | Fcst | 297 | 11.3 | D   | None     |
| 2011/03/16 19:00 | Fcst | 316 | 9.8  | D   | None     |
| 2011/03/16 20:00 | Fcst | 309 | 9.4  | D   | None     |
| 2011/03/16 21:00 | Fcst | 294 | 9.5  | D   | None     |
| 2011/03/16 22:00 | Fcst | 299 | 7.6  | D   | None     |
| 2011/03/16 23:00 | Fcst | 300 | 9.7  | D   | None     |
| 2011/03/17 00:00 | Fcst | 294 | 5.0  | D   | None     |
| 2011/03/17 01:00 | Fcst | 286 | 7.0  | D   | None     |
| 2011/03/17 02:00 | Fcst | 287 | 6.6  | D   | None     |

|                  |      |     |      |   |      |
|------------------|------|-----|------|---|------|
| 2011/03/17 03:00 | Fcst | 293 | 6.5  | D | None |
| 2011/03/17 04:00 | Fcst | 300 | 6.3  | D | None |
| 2011/03/17 05:00 | Fcst | 311 | 5.9  | D | None |
| 2011/03/17 06:00 | Fcst | 295 | 7.4  | D | None |
| 2011/03/17 07:00 | Fcst | 303 | 8.4  | C | None |
| 2011/03/17 08:00 | Fcst | 333 | 4.8  | C | None |
| 2011/03/17 09:00 | Fcst | 321 | 5.9  | C | None |
| 2011/03/17 10:00 | Fcst | 307 | 5.0  | C | None |
| 2011/03/17 11:00 | Fcst | 292 | 8.4  | C | None |
| 2011/03/17 12:00 | Fcst | 315 | 9.3  | C | None |
| 2011/03/17 13:00 | Fcst | 299 | 11.1 | C | None |
| 2011/03/17 14:00 | Fcst | 292 | 11.8 | C | None |
| 2011/03/17 15:00 | Fcst | 286 | 10.7 | C | None |
| 2011/03/17 16:00 | Fcst | 298 | 9.3  | D | None |
| 2011/03/17 17:00 | Fcst | 286 | 8.5  | D | None |
| 2011/03/17 18:00 | Fcst | 285 | 10.6 | D | None |
| 2011/03/17 19:00 | Fcst | 288 | 11.1 | D | None |
| 2011/03/17 20:00 | Fcst | 301 | 11.3 | D | None |
| 2011/03/17 21:00 | Fcst | 311 | 10.1 | D | None |
| 2011/03/17 22:00 | Fcst | 307 | 8.4  | D | None |
| 2011/03/17 23:00 | Fcst | 303 | 8.7  | D | None |
| 2011/03/18 00:00 | Fcst | 311 | 7.1  | D | None |
| 2011/03/18 01:00 | Fcst | 316 | 3.4  | D | None |
| 2011/03/18 02:00 | Fcst | 310 | 6.0  | D | None |
| 2011/03/18 03:00 | Fcst | 319 | 7.4  | D | None |
| 2011/03/18 04:00 | Fcst | 316 | 6.3  | D | None |
| 2011/03/18 05:00 | Fcst | 307 | 4.9  | D | None |
| 2011/03/18 06:00 | Fcst | 311 | 4.4  | D | None |
| 2011/03/18 07:00 | Fcst | 326 | 5.1  | C | None |
| 2011/03/18 08:00 | Fcst | 343 | 5.4  | C | None |
| 2011/03/18 09:00 | Fcst | 344 | 6.1  | C | None |

Dataset options: Est. missing stability using: Wind speed, time of day, etc.  
Adjust stability for consistency: No  
Modify winds for topography: Yes

#### Calculations

Case description: U4 Fukushima approximate full SFP release  
End of calculations: 2011/03/17 19:50  
Start of release to atmosphere + 24 h  
Distance of calculation: Close-in + to 50 miles  
Close-in distances: 0.5, 1.0, 1.5, 2.0, 3.0, 5.0, 7.0, 10.0 miles



## Case Summary

**Event Type** Nuclear Power Plant

### Location

Name: Fukushima Unit 2  
 City, county, state: <undefined>, <undefined>, <undefined>  
 Lat / Long / Elev: 37.4214° N, 141.0325° E, 0 m  
 Time zone: <undefined>  
 Population: not available

### Reactor Parameters

Reactor power: 2350 MWt  
 Average fuel burn-up: 30000 MWD / MTU  
 Containment type: BWR Mark I  
 Containment volume: 2.50E+05 ft<sup>3</sup>  
 Design pressure: 60 lb/in<sup>2</sup>  
 Design leak rate: 0.54 %/d  
 Coolant mass: 1.25E+05 kg  
 Assemblies in core: 550

### Source Term

Type: Time Core Is Uncovered  
 Shutdown: 2011/03/11 14:46  
 Core uncovered: 2011/03/15 06:00  
 Core recovered: No

### Release Pathway

Type: BWR - Release Through Dry Well  
 via direct, unfiltered pathway  
 Description: total failure of containment  
 Release height: 10. m

#### Release events

2011/03/16 19:05 Leak rate (% vol) Total failure  
 2011/03/16 19:05 Sprays Off

### Meteorology

Type: Actual Observations  
 Dataset name: Fukushima 16MAR 0945  
 Dataset desc: Obs/fcsts for Fukushima unit 2, 3, 4

| Summary of data<br>at release point: | Type | Dir<br>deg | Speed<br>m/s | Stab<br>class | Precip | Temp<br>°C |
|--------------------------------------|------|------------|--------------|---------------|--------|------------|
| 2011/03/12 14:00                     | Obs  | 265        | 1.0          | B             | ?      |            |
| 2011/03/12 15:00                     | Obs  | 265        | 1.0          | B             | ?      |            |
| 2011/03/12 16:00                     | Obs  | 277        | 1.3          | B             | ?      |            |
| 2011/03/12 17:00                     | Obs  | 260        | 2.4          | B             | ?      |            |
| 2011/03/12 18:00                     | Obs  | 241        | 1.4          | E             | ?      |            |
| 2011/03/12 19:00                     | Obs  | 236        | 2.1          | E             | ?      |            |
| 2011/03/12 20:00                     | Obs  | 239        | 2.1          | E             | ?      |            |
| 2011/03/12 21:00                     | Obs  | 229        | 3.8          | E             | ?      |            |
| 2011/03/12 22:00                     | Obs  | 224        | 5.1          | E             | ?      |            |
| 2011/03/12 23:00                     | Obs  | 226        | 3.9          | E             | ?      |            |
| 2011/03/13 00:00                     | Obs  | 228        | 4.1          | E             | ?      |            |

|                  |      |     |      |     |          |
|------------------|------|-----|------|-----|----------|
| 2011/03/13 01:00 | Obs  | 235 | 2.6  | E   | ?        |
| 2011/03/13 02:00 | Obs  | 233 | 3.9  | E   | ?        |
| 2011/03/13 03:00 | Obs  | 225 | 1.8  | E   | ?        |
| 2011/03/13 04:00 | Obs  | 225 | 1.3  | E   | ?        |
| 2011/03/13 05:00 | Obs  | 225 | 2.2  | E   | ?        |
| 2011/03/13 06:00 | Obs  | 225 | 2.2  | E   | ?        |
| 2011/03/13 07:00 | Obs  | 248 | 2.7  | E   | ?        |
| 2011/03/13 08:00 | Obs  | 248 | 2.7  | E   | ?        |
| 2011/03/13 09:00 | Obs  | 270 | 3.1  | E   | ?        |
| 2011/03/13 12:00 | Obs  | 271 | 7.4  | D   | ?        |
| 2011/03/13 13:00 | Obs  | 276 | 6.2  | D   | ?        |
| 2011/03/13 14:00 | Obs  | 312 | 2.8  | B   | ?        |
| 2011/03/14 18:00 | Obs  | 258 | 4.8  | unk | ?        |
| 2011/03/14 19:00 | Obs  | 268 | 5.0  | unk | ?        |
| 2011/03/14 20:00 | Obs  | 330 | 2.2  | unk | ?        |
| 2011/03/14 21:00 | Fcst | 337 | 4.6  | unk | ?        |
| 2011/03/14 22:00 | Fcst | 323 | 7.2  | unk | ?        |
| 2011/03/14 23:00 | Fcst | 305 | 6.6  | unk | ?        |
| 2011/03/15 00:00 | Fcst | 015 | 8.6  | unk | ?        |
| 2011/03/15 02:00 | Fcst | 002 | 7.5  | unk | ?        |
| 2011/03/15 03:00 | Fcst | 347 | 5.2  | E   | None     |
| 2011/03/15 04:00 | Fcst | 332 | 5.6  | E   | None     |
| 2011/03/15 05:00 | Fcst | 332 | 4.0  | E   | None     |
| 2011/03/15 06:00 | Fcst | 344 | 3.5  | E   | Lgt rain |
| 2011/03/15 07:00 | Fcst | 026 | 3.8  | E   | Lgt rain |
| 2011/03/15 08:00 | Fcst | 044 | 4.4  | E   | Lgt rain |
| 2011/03/15 09:00 | Fcst | 020 | 4.2  | E   | Lgt rain |
| 2011/03/15 10:00 | Fcst | 010 | 3.4  | E   | None     |
| 2011/03/15 11:00 | Fcst | 030 | 3.5  | D   | Lgt rain |
| 2011/03/15 12:00 | Fcst | 027 | 3.0  | D   | Lgt rain |
| 2011/03/15 13:00 | Fcst | 037 | 3.4  | D   | Lgt rain |
| 2011/03/15 14:00 | Fcst | 053 | 3.7  | B   | None     |
| 2011/03/15 15:00 | Fcst | 058 | 3.7  | B   | None     |
| 2011/03/15 16:00 | Fcst | 067 | 3.2  | C   | Lgt rain |
| 2011/03/15 17:00 | Fcst | 081 | 3.9  | C   | Lgt rain |
| 2011/03/15 18:00 | Fcst | 089 | 4.7  | B   | None     |
| 2011/03/15 19:00 | Fcst | 085 | 4.4  | B   | None     |
| 2011/03/15 20:00 | Fcst | 083 | 4.4  | B   | Lgt rain |
| 2011/03/15 21:00 | Fcst | 074 | 4.6  | C   | Lgt rain |
| 2011/03/15 22:00 | Fcst | 054 | 5.0  | D   | Lgt rain |
| 2011/03/15 23:00 | Fcst | 029 | 5.6  | D   | Rain     |
| 2011/03/16 00:00 | Fcst | 011 | 5.1  | D   | Lgt rain |
| 2011/03/16 01:00 | Fcst | 346 | 4.3  | C   | Lgt rain |
| 2011/03/16 02:00 | Fcst | 350 | 5.3  | D   | Lgt rain |
| 2011/03/16 03:00 | Fcst | 323 | 5.6  | D   | Lgt rain |
| 2011/03/16 04:00 | Fcst | 316 | 5.4  | D   | None     |
| 2011/03/16 05:00 | Fcst | 298 | 4.8  | D   | None     |
| 2011/03/16 06:00 | Fcst | 314 | 5.6  | D   | None     |
| 2011/03/16 07:00 | Fcst | 312 | 4.7  | D   | None     |
| 2011/03/16 08:00 | Fcst | 331 | 4.9  | D   | None     |
| 2011/03/16 09:00 | Fcst | 299 | 4.2  | D   | None     |
| 2011/03/16 10:00 | Fcst | 312 | 5.4  | C   | None     |
| 2011/03/16 11:00 | Fcst | 309 | 7.5  | C   | None     |
| 2011/03/16 12:00 | Fcst | 304 | 7.2  | C   | None     |
| 2011/03/16 13:00 | Fcst | 314 | 8.8  | C   | None     |
| 2011/03/16 14:00 | Fcst | 325 | 10.4 | C   | None     |

|                  |      |     |      |   |      |
|------------------|------|-----|------|---|------|
| 2011/03/16 15:00 | Fcst | 324 | 12.3 | C | None |
| 2011/03/16 16:00 | Fcst | 304 | 14.7 | D | None |
| 2011/03/16 17:00 | Fcst | 299 | 14.2 | D | None |
| 2011/03/16 18:00 | Fcst | 297 | 11.3 | D | None |
| 2011/03/16 19:00 | Fcst | 316 | 9.8  | D | None |
| 2011/03/16 20:00 | Fcst | 309 | 9.4  | D | None |
| 2011/03/16 21:00 | Fcst | 294 | 9.5  | D | None |
| 2011/03/16 22:00 | Fcst | 299 | 7.6  | D | None |
| 2011/03/16 23:00 | Fcst | 300 | 9.7  | D | None |
| 2011/03/17 00:00 | Fcst | 294 | 5.0  | D | None |
| 2011/03/17 01:00 | Fcst | 286 | 7.0  | D | None |
| 2011/03/17 02:00 | Fcst | 287 | 6.6  | D | None |
| 2011/03/17 03:00 | Fcst | 293 | 6.5  | D | None |
| 2011/03/17 04:00 | Fcst | 300 | 6.3  | D | None |
| 2011/03/17 05:00 | Fcst | 311 | 5.9  | D | None |
| 2011/03/17 06:00 | Fcst | 295 | 7.4  | D | None |
| 2011/03/17 07:00 | Fcst | 303 | 8.4  | C | None |
| 2011/03/17 08:00 | Fcst | 333 | 4.8  | C | None |
| 2011/03/17 09:00 | Fcst | 321 | 5.9  | C | None |
| 2011/03/17 10:00 | Fcst | 307 | 5.0  | C | None |
| 2011/03/17 11:00 | Fcst | 292 | 8.4  | C | None |
| 2011/03/17 12:00 | Fcst | 315 | 9.3  | C | None |
| 2011/03/17 13:00 | Fcst | 299 | 11.1 | C | None |
| 2011/03/17 14:00 | Fcst | 292 | 11.8 | C | None |
| 2011/03/17 15:00 | Fcst | 286 | 10.7 | C | None |
| 2011/03/17 16:00 | Fcst | 298 | 9.3  | D | None |
| 2011/03/17 17:00 | Fcst | 286 | 8.5  | D | None |
| 2011/03/17 18:00 | Fcst | 285 | 10.6 | D | None |
| 2011/03/17 19:00 | Fcst | 288 | 11.1 | D | None |
| 2011/03/17 20:00 | Fcst | 301 | 11.3 | D | None |
| 2011/03/17 21:00 | Fcst | 311 | 10.1 | D | None |
| 2011/03/17 22:00 | Fcst | 307 | 8.4  | D | None |
| 2011/03/17 23:00 | Fcst | 303 | 8.7  | D | None |
| 2011/03/18 00:00 | Fcst | 311 | 7.1  | D | None |
| 2011/03/18 01:00 | Fcst | 316 | 3.4  | D | None |
| 2011/03/18 02:00 | Fcst | 310 | 6.0  | D | None |
| 2011/03/18 03:00 | Fcst | 319 | 7.4  | D | None |
| 2011/03/18 04:00 | Fcst | 316 | 6.3  | D | None |
| 2011/03/18 05:00 | Fcst | 307 | 4.9  | D | None |
| 2011/03/18 06:00 | Fcst | 311 | 4.4  | D | None |
| 2011/03/18 07:00 | Fcst | 326 | 5.1  | C | None |
| 2011/03/18 08:00 | Fcst | 343 | 5.4  | C | None |
| 2011/03/18 09:00 | Fcst | 344 | 6.1  | C | None |

Dataset options:

Est. missing stability using: Wind speed, time of day, etc.  
 Adjust stability for consistency: No  
 Modify winds for topography: Yes

### Calculations

Case description: Fukushima Unit 2 100%core melt no recovery 16MAR 09:45 met data  
 update  
 End of calculations: 2011/03/17 19:05  
 Start of release to atmosphere + 24 h  
 Distance of calculation: Close-in + to 50 miles  
 Close-in distances: 0.5, 1.0, 1.5, 2.0, 3.0, 5.0, 7.0, 10.0 miles

RASCAL v4.1.0 Source Term

File created: 2011/03/16 11:17

Case name: Fukushima Unit 2 100%core melt no recovery 16MAR 09:45 met data update

Radionuclide units: Ci

| Interval | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Start    | 19:05    | 19:20    | 19:35    | 19:50    | 20:05    | 20:20    | 20:35    | 20:50    | 21:05    |
| Am-241   | 2.95E-03 | 2.22E-03 | 1.67E-03 | 1.25E-03 | 9.45E-04 | 7.08E-04 | 5.33E-04 | 4.01E-04 | 3.01E-04 |
| Ba-140   | 2.93E+04 | 2.20E+04 | 1.65E+04 | 1.23E+04 | 9.27E+03 | 6.94E+03 | 5.20E+03 | 3.90E+03 | 2.93E+03 |
| Ce-141   | 1.58E+03 | 1.18E+03 | 8.83E+02 | 6.62E+02 | 4.97E+02 | 3.73E+02 | 2.79E+02 | 2.10E+02 | 1.57E+02 |
| Ce-143   | 1.18E+02 | 8.80E+01 | 6.56E+01 | 4.90E+01 | 3.65E+01 | 2.73E+01 | 2.03E+01 | 1.52E+01 | 1.13E+01 |
| Ce-144   | 1.39E+03 | 1.04E+03 | 7.82E+02 | 5.86E+02 | 4.40E+02 | 3.29E+02 | 2.48E+02 | 1.85E+02 | 1.40E+02 |
| Cm-242   | 4.28E+01 | 3.21E+01 | 2.41E+01 | 1.81E+01 | 1.36E+01 | 1.02E+01 | 7.62E+00 | 5.72E+00 | 4.28E+00 |
| Cs-134   | 1.15E+04 | 8.67E+03 | 6.50E+03 | 4.88E+03 | 3.65E+03 | 2.75E+03 | 2.06E+03 | 1.54E+03 | 1.16E+03 |
| Cs-136   | 3.60E+03 | 2.70E+03 | 2.03E+03 | 1.51E+03 | 1.13E+03 | 8.52E+02 | 6.38E+02 | 4.79E+02 | 3.59E+02 |
| Cs-137   | 8.03E+03 | 6.02E+03 | 4.52E+03 | 3.38E+03 | 2.54E+03 | 1.91E+03 | 1.43E+03 | 1.07E+03 | 8.04E+02 |
| I-131    | 5.12E+04 | 3.84E+04 | 2.88E+04 | 2.16E+04 | 1.61E+04 | 1.22E+04 | 9.09E+03 | 6.80E+03 | 5.09E+03 |
| I-132    | 2.66E+04 | 2.00E+04 | 1.49E+04 | 1.12E+04 | 8.36E+03 | 6.26E+03 | 4.68E+03 | 3.50E+03 | 2.62E+03 |
| I-133    | 2.50E+03 | 1.86E+03 | 1.39E+03 | 1.03E+03 | 7.66E+02 | 5.70E+02 | 4.24E+02 | 3.15E+02 | 2.34E+02 |
| I-135    | 3.21E-01 | 2.35E-01 | 1.71E-01 | 1.25E-01 | 9.18E-02 | 6.69E-02 | 4.89E-02 | 3.56E-02 | 2.61E-02 |
| Kr-85    | 1.27E+05 | 9.54E+04 | 7.14E+04 | 5.36E+04 | 4.01E+04 | 3.02E+04 | 2.26E+04 | 1.69E+04 | 1.27E+04 |
| Kr-85m   | 1.67E-02 | 1.20E-02 | 8.66E-03 | 6.25E-03 | 4.51E-03 | 3.25E-03 | 2.35E-03 | 1.69E-03 | 1.22E-03 |
| Kr-88    | 6.09E-07 | 4.30E-07 | 3.03E-07 | 2.14E-07 | 1.51E-07 | 1.06E-07 | 7.52E-08 | 5.30E-08 | 3.74E-08 |
| La-140   | 1.43E+04 | 1.08E+04 | 8.12E+03 | 6.11E+03 | 4.61E+03 | 3.47E+03 | 2.61E+03 | 1.97E+03 | 1.49E+03 |
| La-141   | 5.26E-07 | 3.77E-07 | 2.71E-07 | 1.94E-07 | 1.40E-07 | 9.99E-08 | 7.18E-08 | 5.16E-08 | 3.70E-08 |
| Mo-99    | 3.32E+02 | 2.48E+02 | 1.85E+02 | 1.39E+02 | 1.04E+02 | 7.78E+01 | 5.81E+01 | 4.36E+01 | 3.26E+01 |
| Nb-95    | 1.76E+03 | 1.31E+03 | 9.90E+02 | 7.39E+02 | 5.54E+02 | 4.16E+02 | 3.12E+02 | 2.34E+02 | 1.76E+02 |
| Nb-97    | 5.75E-01 | 4.28E-01 | 3.17E-01 | 2.36E-01 | 1.75E-01 | 1.30E-01 | 9.63E-02 | 7.15E-02 | 5.31E-02 |
| Nd-147   | 4.93E+02 | 3.70E+02 | 2.77E+02 | 2.08E+02 | 1.56E+02 | 1.17E+02 | 8.75E+01 | 6.56E+01 | 4.91E+01 |
| Np-239   | 4.94E+03 | 3.70E+03 | 2.76E+03 | 2.07E+03 | 1.55E+03 | 1.15E+03 | 8.63E+02 | 6.45E+02 | 4.82E+02 |
| Pm-147   | 2.19E+00 | 1.64E+00 | 1.23E+00 | 9.27E-01 | 6.96E-01 | 5.23E-01 | 3.92E-01 | 2.95E-01 | 2.21E-01 |
| Pr-143   | 1.19E+03 | 8.91E+02 | 6.68E+02 | 5.00E+02 | 3.75E+02 | 2.82E+02 | 2.11E+02 | 1.58E+02 | 1.19E+02 |
| Pr-144   | 1.39E+03 | 1.04E+03 | 7.82E+02 | 5.86E+02 | 4.40E+02 | 3.29E+02 | 2.48E+02 | 1.85E+02 | 1.40E+02 |
| Pu-238   | 4.91E-03 | 3.70E-03 | 2.78E-03 | 2.09E-03 | 1.57E-03 | 1.18E-03 | 8.86E-04 | 6.65E-04 | 5.00E-04 |
| Pu-239   | 4.74E-03 | 3.56E-03 | 2.67E-03 | 2.01E-03 | 1.50E-03 | 1.13E-03 | 8.50E-04 | 6.37E-04 | 4.79E-04 |
| Pu-241   | 1.31E+02 | 9.90E+01 | 7.40E+01 | 5.55E+01 | 4.17E+01 | 3.12E+01 | 2.34E+01 | 1.76E+01 | 1.31E+01 |
| Rb-86    | 1.39E+02 | 1.04E+02 | 7.79E+01 | 5.85E+01 | 4.38E+01 | 3.29E+01 | 2.47E+01 | 1.85E+01 | 1.39E+01 |
| Rb-88    | 6.81E-07 | 4.81E-07 | 3.39E-07 | 2.39E-07 | 1.69E-07 | 1.19E-07 | 8.40E-08 | 5.92E-08 | 4.18E-08 |
| Rh-103m  | 9.81E+02 | 7.37E+02 | 5.53E+02 | 4.14E+02 | 3.11E+02 | 2.33E+02 | 1.75E+02 | 1.31E+02 | 9.81E+01 |
| Rh-105   | 7.03E+01 | 5.25E+01 | 3.92E+01 | 2.92E+01 | 2.18E+01 | 1.63E+01 | 1.22E+01 | 9.09E+00 | 6.76E+00 |
| Ru-103   | 9.81E+02 | 7.38E+02 | 5.54E+02 | 4.15E+02 | 3.11E+02 | 2.33E+02 | 1.75E+02 | 1.31E+02 | 9.81E+01 |
| Ru-105   | 2.84E-06 | 2.04E-06 | 1.48E-06 | 1.06E-06 | 7.68E-07 | 5.54E-07 | 4.00E-07 | 2.88E-07 | 2.08E-07 |
| Ru-106   | 2.97E+02 | 2.22E+02 | 1.67E+02 | 1.25E+02 | 9.36E+01 | 7.04E+01 | 5.28E+01 | 3.96E+01 | 2.97E+01 |
| Sb-127   | 1.93E+03 | 1.44E+03 | 1.08E+03 | 8.06E+02 | 6.04E+02 | 4.52E+02 | 3.38E+02 | 2.53E+02 | 1.90E+02 |
| Sb-129   | 3.85E-05 | 2.78E-05 | 2.00E-05 | 1.44E-05 | 1.04E-05 | 7.49E-06 | 5.39E-06 | 3.89E-06 | 2.80E-06 |
| Sr-89    | 1.84E+04 | 1.38E+04 | 1.04E+04 | 7.74E+03 | 5.81E+03 | 4.35E+03 | 3.26E+03 | 2.45E+03 | 1.84E+03 |
| Sr-90    | 1.52E+03 | 1.14E+03 | 8.54E+02 | 6.41E+02 | 4.81E+02 | 3.60E+02 | 2.70E+02 | 2.03E+02 | 1.52E+02 |
| Sr-91    | 2.84E+00 | 2.09E+00 | 1.54E+00 | 1.13E+00 | 8.35E-01 | 6.16E-01 | 4.53E-01 | 3.34E-01 | 2.46E-01 |

|         |          |          |          |          |          |          |          |          |          |
|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Sr-92   | 4.20E-10 | 2.96E-10 | 2.08E-10 | 1.47E-10 | 1.04E-10 | 7.25E-11 | 5.10E-11 | 3.59E-11 | 0.00E+00 |
| Tc-99m  | 3.20E+02 | 2.39E+02 | 1.79E+02 | 1.34E+02 | 9.99E+01 | 7.50E+01 | 5.61E+01 | 4.19E+01 | 3.14E+01 |
| Te-127  | 2.93E+03 | 2.19E+03 | 1.64E+03 | 1.22E+03 | 9.18E+02 | 6.89E+02 | 5.16E+02 | 3.86E+02 | 2.90E+02 |
| Te-127m | 8.03E+02 | 6.02E+02 | 4.52E+02 | 3.38E+02 | 2.54E+02 | 1.91E+02 | 1.43E+02 | 1.07E+02 | 8.04E+01 |
| Te-129  | 2.03E+03 | 1.51E+03 | 1.13E+03 | 8.52E+02 | 6.39E+02 | 4.79E+02 | 3.59E+02 | 2.69E+02 | 2.02E+02 |
| Te-129m | 3.11E+03 | 2.33E+03 | 1.75E+03 | 1.31E+03 | 9.81E+02 | 7.36E+02 | 5.52E+02 | 4.14E+02 | 3.11E+02 |
| Te-131  | 1.40E+02 | 1.05E+02 | 7.83E+01 | 5.84E+01 | 4.36E+01 | 3.25E+01 | 2.42E+01 | 1.81E+01 | 1.35E+01 |
| Te-131m | 6.26E+02 | 4.66E+02 | 3.47E+02 | 2.59E+02 | 1.94E+02 | 1.44E+02 | 1.07E+02 | 8.02E+01 | 5.98E+01 |
| Te-132  | 2.59E+04 | 1.94E+04 | 1.45E+04 | 1.09E+04 | 8.12E+03 | 6.08E+03 | 4.55E+03 | 3.40E+03 | 2.55E+03 |
| Xe-131m | 1.58E+05 | 1.19E+05 | 8.91E+04 | 6.68E+04 | 5.00E+04 | 3.75E+04 | 2.81E+04 | 2.11E+04 | 1.58E+04 |
| Xe-133  | 1.63E+07 | 1.22E+07 | 9.18E+06 | 6.86E+06 | 5.14E+06 | 3.84E+06 | 2.88E+06 | 2.16E+06 | 1.62E+06 |
| Xe-133m | 1.96E+05 | 1.47E+05 | 1.10E+05 | 8.19E+04 | 6.12E+04 | 4.58E+04 | 3.42E+04 | 2.56E+04 | 1.91E+04 |
| Xe-135  | 5.64E+03 | 4.15E+03 | 3.05E+03 | 2.25E+03 | 1.66E+03 | 1.22E+03 | 8.96E+02 | 6.61E+02 | 4.86E+02 |
| Xe-135m | 4.22E+00 | 3.56E+00 | 3.26E+00 | 3.09E+00 | 2.97E+00 | 2.88E+00 | 2.80E+00 | 2.73E+00 | 2.65E+00 |
| Y-90    | 5.21E+02 | 3.92E+02 | 2.96E+02 | 2.23E+02 | 1.68E+02 | 1.27E+02 | 9.54E+01 | 7.20E+01 | 5.43E+01 |
| Y-91    | 1.17E+03 | 8.80E+02 | 6.60E+02 | 4.95E+02 | 3.71E+02 | 2.78E+02 | 2.09E+02 | 1.57E+02 | 1.17E+02 |
| Y-91m   | 1.80E+00 | 1.32E+00 | 9.72E-01 | 7.18E-01 | 5.29E-01 | 3.90E-01 | 2.87E-01 | 2.12E-01 | 1.56E-01 |
| Y-92    | 1.65E-07 | 1.18E-07 | 8.41E-08 | 6.01E-08 | 4.29E-08 | 3.07E-08 | 2.19E-08 | 1.57E-08 | 1.12E-08 |
| Y-93    | 1.95E-01 | 1.44E-01 | 1.06E-01 | 7.81E-02 | 5.76E-02 | 4.25E-02 | 3.13E-02 | 2.30E-02 | 1.70E-02 |
| Zr-95   | 1.64E+03 | 1.23E+03 | 9.27E+02 | 6.92E+02 | 5.19E+02 | 3.89E+02 | 2.92E+02 | 2.19E+02 | 1.64E+02 |
| Zr-97   | 1.01E+01 | 7.49E+00 | 5.55E+00 | 4.12E+00 | 3.06E+00 | 2.28E+00 | 1.68E+00 | 1.25E+00 | 9.27E-01 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | ##### |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------|
| 21:20    | 21:35    | 21:50    | 22:05    | 22:20    | 22:35    | 22:50    | 23:05    | 23:20    | 23:35    |       |
| 2.26E-04 | 1.70E-04 | 1.28E-04 | 9.63E-05 | 7.21E-05 | 5.42E-05 | 4.07E-05 | 3.06E-05 | 2.30E-05 | 1.73E-05 |       |
| 2.19E+03 | 1.64E+03 | 1.23E+03 | 9.27E+02 | 6.91E+02 | 5.18E+02 | 3.89E+02 | 2.92E+02 | 2.19E+02 | 1.64E+02 |       |
| 1.18E+02 | 8.83E+01 | 6.62E+01 | 4.96E+01 | 3.72E+01 | 2.79E+01 | 2.09E+01 | 1.57E+01 | 1.18E+01 | 8.82E+00 |       |
| 8.44E+00 | 6.30E+00 | 4.70E+00 | 3.51E+00 | 2.62E+00 | 1.95E+00 | 1.46E+00 | 1.09E+00 | 8.11E-01 | 6.05E-01 |       |
| 1.04E+02 | 7.82E+01 | 5.87E+01 | 4.40E+01 | 3.30E+01 | 2.48E+01 | 1.85E+01 | 1.40E+01 | 1.04E+01 | 7.83E+00 |       |
| 3.21E+00 | 2.41E+00 | 1.81E+00 | 1.36E+00 | 1.02E+00 | 7.62E-01 | 5.72E-01 | 4.29E-01 | 3.21E-01 | 2.41E-01 |       |
| 8.68E+02 | 6.51E+02 | 4.88E+02 | 3.66E+02 | 2.75E+02 | 2.06E+02 | 1.55E+02 | 1.16E+02 | 8.69E+01 | 6.52E+01 |       |
| 2.69E+02 | 2.02E+02 | 1.51E+02 | 1.13E+02 | 8.49E+01 | 6.36E+01 | 4.77E+01 | 3.57E+01 | 2.68E+01 | 2.01E+01 |       |
| 6.03E+02 | 4.52E+02 | 3.39E+02 | 2.55E+02 | 1.91E+02 | 1.43E+02 | 1.07E+02 | 8.05E+01 | 6.03E+01 | 4.53E+01 |       |
| 3.82E+03 | 2.86E+03 | 2.14E+03 | 1.60E+03 | 1.21E+03 | 9.00E+02 | 6.76E+02 | 5.07E+02 | 3.80E+02 | 2.84E+02 |       |
| 1.96E+03 | 1.47E+03 | 1.10E+03 | 8.23E+02 | 6.16E+02 | 4.61E+02 | 3.45E+02 | 2.58E+02 | 1.93E+02 | 1.44E+02 |       |
| 1.75E+02 | 1.30E+02 | 9.63E+01 | 7.17E+01 | 5.33E+01 | 3.97E+01 | 2.95E+01 | 2.20E+01 | 1.63E+01 | 1.22E+01 |       |
| 1.91E-02 | 1.40E-02 | 1.02E-02 | 7.43E-03 | 5.43E-03 | 3.96E-03 | 2.90E-03 | 2.12E-03 | 1.55E-03 | 1.13E-03 |       |
| 9.54E+03 | 7.15E+03 | 5.36E+03 | 4.02E+03 | 3.02E+03 | 2.26E+03 | 1.69E+03 | 1.27E+03 | 9.54E+02 | 7.16E+02 |       |
| 8.82E-04 | 6.36E-04 | 4.59E-04 | 3.31E-04 | 2.39E-04 | 1.73E-04 | 1.24E-04 | 8.98E-05 | 6.48E-05 | 4.68E-05 |       |
| 2.64E-08 | 1.86E-08 | 1.31E-08 | 9.27E-09 | 6.53E-09 | 4.61E-09 | 3.26E-09 | 2.30E-09 | 1.62E-09 | 1.14E-09 |       |
| 1.12E+03 | 8.41E+02 | 6.34E+02 | 4.77E+02 | 3.59E+02 | 2.70E+02 | 2.03E+02 | 1.53E+02 | 1.15E+02 | 8.69E+01 |       |
| 2.66E-08 | 1.91E-08 | 1.37E-08 | 9.81E-09 | 7.05E-09 | 5.06E-09 | 3.63E-09 | 2.60E-09 | 1.87E-09 | 1.34E-09 |       |
| 2.44E+01 | 1.82E+01 | 1.36E+01 | 1.02E+01 | 7.62E+00 | 5.71E+00 | 4.27E+00 | 3.20E+00 | 2.39E+00 | 1.78E+00 |       |
| 1.31E+02 | 9.90E+01 | 7.40E+01 | 5.55E+01 | 4.16E+01 | 3.12E+01 | 2.34E+01 | 1.76E+01 | 1.31E+01 | 9.90E+00 |       |
| 3.94E-02 | 2.93E-02 | 2.17E-02 | 1.61E-02 | 1.20E-02 | 8.88E-03 | 6.59E-03 | 4.90E-03 | 3.64E-03 | 2.70E-03 |       |
| 3.68E+01 | 2.76E+01 | 2.07E+01 | 1.55E+01 | 1.16E+01 | 8.71E+00 | 6.53E+00 | 4.90E+00 | 3.67E+00 | 2.75E+00 |       |
| 3.61E+02 | 2.70E+02 | 2.02E+02 | 1.51E+02 | 1.13E+02 | 8.43E+01 | 6.31E+01 | 4.72E+01 | 3.53E+01 | 2.64E+01 |       |
| 1.67E-01 | 1.25E-01 | 9.36E-02 | 7.06E-02 | 5.30E-02 | 3.98E-02 | 2.99E-02 | 2.25E-02 | 1.69E-02 | 1.27E-02 |       |
| 8.88E+01 | 6.66E+01 | 5.00E+01 | 3.74E+01 | 2.81E+01 | 2.11E+01 | 1.58E+01 | 1.18E+01 | 8.86E+00 | 6.64E+00 |       |
| 1.04E+02 | 7.82E+01 | 5.87E+01 | 4.40E+01 | 3.30E+01 | 2.48E+01 | 1.85E+01 | 1.40E+01 | 1.04E+01 | 7.83E+00 |       |
| 3.76E-04 | 2.83E-04 | 2.12E-04 | 1.59E-04 | 1.20E-04 | 9.00E-05 | 6.77E-05 | 5.09E-05 | 3.82E-05 | 2.87E-05 |       |
| 3.59E-04 | 2.70E-04 | 2.03E-04 | 1.52E-04 | 1.14E-04 | 8.56E-05 | 6.43E-05 | 4.82E-05 | 3.62E-05 | 2.72E-05 |       |
| 9.90E+00 | 7.41E+00 | 5.56E+00 | 4.17E+00 | 3.12E+00 | 2.35E+00 | 1.76E+00 | 1.32E+00 | 9.90E-01 | 7.42E-01 |       |
| 1.04E+01 | 7.79E+00 | 5.83E+00 | 4.37E+00 | 3.28E+00 | 2.46E+00 | 1.85E+00 | 1.39E+00 | 1.04E+00 | 7.77E-01 |       |
| 2.95E-08 | 2.08E-08 | 1.47E-08 | 1.04E-08 | 7.31E-09 | 5.16E-09 | 3.64E-09 | 2.57E-09 | 1.81E-09 | 1.28E-09 |       |
| 7.36E+01 | 5.53E+01 | 4.14E+01 | 3.11E+01 | 2.33E+01 | 1.75E+01 | 1.31E+01 | 9.81E+00 | 7.36E+00 | 5.52E+00 |       |
| 5.05E+00 | 3.76E+00 | 2.81E+00 | 2.10E+00 | 1.57E+00 | 1.17E+00 | 8.72E-01 | 6.51E-01 | 4.86E-01 | 3.63E-01 |       |
| 7.38E+01 | 5.54E+01 | 4.15E+01 | 3.11E+01 | 2.33E+01 | 1.75E+01 | 1.31E+01 | 9.81E+00 | 7.38E+00 | 5.54E+00 |       |
| 1.49E-07 | 1.08E-07 | 7.79E-08 | 5.63E-08 | 4.06E-08 | 2.93E-08 | 2.11E-08 | 1.52E-08 | 1.10E-08 | 7.92E-09 |       |
| 2.22E+01 | 1.67E+01 | 1.25E+01 | 9.36E+00 | 7.05E+00 | 5.28E+00 | 3.96E+00 | 2.97E+00 | 2.23E+00 | 1.67E+00 |       |
| 1.42E+02 | 1.06E+02 | 7.95E+01 | 5.95E+01 | 4.46E+01 | 3.34E+01 | 2.49E+01 | 1.87E+01 | 1.40E+01 | 1.04E+01 |       |
| 2.02E-06 | 1.46E-06 | 1.04E-06 | 7.55E-07 | 5.44E-07 | 3.92E-07 | 2.83E-07 | 2.03E-07 | 1.47E-07 | 1.05E-07 |       |
| 1.38E+03 | 1.04E+03 | 7.74E+02 | 5.81E+02 | 4.35E+02 | 3.26E+02 | 2.45E+02 | 1.84E+02 | 1.38E+02 | 1.04E+02 |       |
| 1.14E+02 | 8.55E+01 | 6.41E+01 | 4.81E+01 | 3.61E+01 | 2.71E+01 | 2.03E+01 | 1.52E+01 | 1.14E+01 | 8.56E+00 |       |
| 1.81E-01 | 1.33E-01 | 9.81E-02 | 7.23E-02 | 5.32E-02 | 3.92E-02 | 2.89E-02 | 2.12E-02 | 1.57E-02 | 1.15E-02 |       |

|          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.35E+01 | 1.76E+01 | 1.31E+01 | 9.81E+00 | 7.35E+00 | 5.50E+00 | 4.11E+00 | 3.08E+00 | 2.30E+00 | 1.72E+00 |          |
| 2.17E+02 | 1.62E+02 | 1.22E+02 | 9.09E+01 | 6.82E+01 | 5.11E+01 | 3.83E+01 | 2.86E+01 | 2.14E+01 | 1.61E+01 |          |
| 6.03E+01 | 4.52E+01 | 3.39E+01 | 2.54E+01 | 1.91E+01 | 1.43E+01 | 1.07E+01 | 8.05E+00 | 6.03E+00 | 4.53E+00 |          |
| 1.51E+02 | 1.13E+02 | 8.51E+01 | 6.38E+01 | 4.79E+01 | 3.59E+01 | 2.69E+01 | 2.02E+01 | 1.51E+01 | 1.13E+01 |          |
| 2.32E+02 | 1.75E+02 | 1.31E+02 | 9.81E+01 | 7.35E+01 | 5.52E+01 | 4.13E+01 | 3.10E+01 | 2.32E+01 | 1.75E+01 |          |
| 9.99E+00 | 7.48E+00 | 5.58E+00 | 4.16E+00 | 3.11E+00 | 2.31E+00 | 1.73E+00 | 1.29E+00 | 9.63E-01 | 7.16E-01 |          |
| 4.46E+01 | 3.32E+01 | 2.48E+01 | 1.85E+01 | 1.38E+01 | 1.03E+01 | 7.66E+00 | 5.72E+00 | 4.26E+00 | 3.18E+00 |          |
| 1.91E+03 | 1.42E+03 | 1.07E+03 | 7.98E+02 | 5.98E+02 | 4.47E+02 | 3.35E+02 | 2.50E+02 | 1.87E+02 | 1.40E+02 |          |
| 1.19E+04 | 8.87E+03 | 6.65E+03 | 4.99E+03 | 3.74E+03 | 2.80E+03 | 2.10E+03 | 1.58E+03 | 1.18E+03 | 8.85E+02 |          |
| 1.22E+06 | 9.09E+05 | 6.80E+05 | 5.09E+05 | 3.81E+05 | 2.85E+05 | 2.13E+05 | 1.60E+05 | 1.20E+05 | 8.98E+04 |          |
| 1.43E+04 | 1.07E+04 | 7.99E+03 | 5.98E+03 | 4.46E+03 | 3.34E+03 | 2.49E+03 | 1.86E+03 | 1.40E+03 | 1.04E+03 |          |
| 3.58E+02 | 2.64E+02 | 1.94E+02 | 1.43E+02 | 1.06E+02 | 7.82E+01 | 5.79E+01 | 4.29E+01 | 3.19E+01 | 2.38E+01 |          |
| 2.58E+00 | 2.51E+00 | 2.45E+00 | 2.39E+00 | 2.32E+00 | 2.26E+00 | 2.21E+00 | 2.14E+00 | 2.09E+00 | 2.03E+00 |          |
| 4.09E+01 | 3.08E+01 | 2.32E+01 | 1.75E+01 | 1.32E+01 | 9.90E+00 | 7.49E+00 | 5.64E+00 | 4.25E+00 | 3.20E+00 |          |
| 8.80E+01 | 6.60E+01 | 4.95E+01 | 3.71E+01 | 2.78E+01 | 2.09E+01 | 1.57E+01 | 1.17E+01 | 8.80E+00 | 6.60E+00 |          |
| 1.14E-01 | 8.44E-02 | 6.22E-02 | 4.58E-02 | 3.38E-02 | 2.48E-02 | 1.83E-02 | 1.35E-02 | 9.90E-03 | 7.30E-03 |          |
| 7.98E-09 | 5.71E-09 | 4.08E-09 | 2.91E-09 | 2.08E-09 | 1.49E-09 | 1.06E-09 | 7.58E-10 | 5.42E-10 | 3.87E-10 |          |
| 1.25E-02 | 9.27E-03 | 6.81E-03 | 5.02E-03 | 3.71E-03 | 2.73E-03 | 2.02E-03 | 1.49E-03 | 1.10E-03 | 8.06E-04 |          |
| 1.23E+02 | 9.27E+01 | 6.92E+01 | 5.19E+01 | 3.90E+01 | 2.92E+01 | 2.19E+01 | 1.64E+01 | 1.23E+01 | 9.27E+00 |          |
| 6.90E-01 | 5.12E-01 | 3.81E-01 | 2.83E-01 | 2.10E-01 | 1.56E-01 | 1.15E-01 | 8.58E-02 | 6.36E-02 | 4.73E-02 |          |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 23:50    | 0:05     | 0:20     | 0:35     | 0:50     | 1:05     | 1:20     | 1:35     | 1:50     | 2:05     |
| 1.30E-05 | 9.72E-06 | 7.34E-06 | 5.51E-06 | 4.14E-06 | 3.11E-06 | 2.34E-06 | 1.76E-06 | 1.32E-06 | 9.90E-07 |
| 1.22E+02 | 9.18E+01 | 6.89E+01 | 5.17E+01 | 3.87E+01 | 2.90E+01 | 2.18E+01 | 1.63E+01 | 1.22E+01 | 9.18E+00 |
| 6.62E+00 | 4.96E+00 | 3.72E+00 | 2.79E+00 | 2.09E+00 | 1.57E+00 | 1.18E+00 | 8.81E-01 | 6.61E-01 | 4.96E-01 |
| 4.52E-01 | 3.37E-01 | 2.51E-01 | 1.87E-01 | 1.40E-01 | 1.04E-01 | 7.79E-02 | 5.81E-02 | 4.34E-02 | 3.23E-02 |
| 5.88E+00 | 4.40E+00 | 3.30E+00 | 2.48E+00 | 1.85E+00 | 1.40E+00 | 1.04E+00 | 7.84E-01 | 5.88E-01 | 4.41E-01 |
| 1.81E-01 | 1.36E-01 | 1.02E-01 | 7.63E-02 | 5.72E-02 | 4.29E-02 | 3.22E-02 | 2.41E-02 | 1.81E-02 | 1.36E-02 |
| 4.89E+01 | 3.66E+01 | 2.75E+01 | 2.06E+01 | 1.55E+01 | 1.16E+01 | 8.69E+00 | 6.53E+00 | 4.89E+00 | 3.67E+00 |
| 1.50E+01 | 1.13E+01 | 8.46E+00 | 6.35E+00 | 4.75E+00 | 3.56E+00 | 2.67E+00 | 2.01E+00 | 1.50E+00 | 1.13E+00 |
| 3.39E+01 | 2.55E+01 | 1.91E+01 | 1.43E+01 | 1.07E+01 | 8.06E+00 | 6.04E+00 | 4.53E+00 | 3.40E+00 | 2.55E+00 |
| 2.13E+02 | 1.59E+02 | 1.20E+02 | 8.96E+01 | 6.71E+01 | 5.03E+01 | 3.77E+01 | 2.83E+01 | 2.12E+01 | 1.58E+01 |
| 1.08E+02 | 8.09E+01 | 6.06E+01 | 4.53E+01 | 3.39E+01 | 2.54E+01 | 1.90E+01 | 1.42E+01 | 1.06E+01 | 7.96E+00 |
| 9.00E+00 | 6.71E+00 | 5.00E+00 | 3.72E+00 | 2.76E+00 | 2.05E+00 | 1.53E+00 | 1.13E+00 | 8.46E-01 | 6.29E-01 |
| 8.24E-04 | 6.02E-04 | 4.40E-04 | 3.21E-04 | 2.35E-04 | 1.72E-04 | 1.25E-04 | 9.18E-05 | 6.70E-05 | 4.89E-05 |
| 5.36E+02 | 4.02E+02 | 3.02E+02 | 2.26E+02 | 1.70E+02 | 1.27E+02 | 9.54E+01 | 7.16E+01 | 5.37E+01 | 4.03E+01 |
| 3.38E-05 | 2.44E-05 | 1.76E-05 | 1.27E-05 | 9.18E-06 | 6.61E-06 | 4.77E-06 | 3.44E-06 | 2.48E-06 | 1.79E-06 |
| 8.06E-10 | 5.69E-10 | 4.01E-10 | 2.83E-10 | 2.00E-10 | 1.41E-10 | 9.90E-11 | 7.01E-11 | 4.95E-11 | 3.49E-11 |
| 6.54E+01 | 4.92E+01 | 3.71E+01 | 2.79E+01 | 2.10E+01 | 1.58E+01 | 1.19E+01 | 8.96E+00 | 6.74E+00 | 5.08E+00 |
| 9.63E-10 | 6.91E-10 | 4.96E-10 | 3.56E-10 | 2.56E-10 | 1.84E-10 | 1.31E-10 | 9.45E-11 | 6.78E-11 | 4.87E-11 |
| 1.33E+00 | 9.99E-01 | 7.47E-01 | 5.59E-01 | 4.19E-01 | 3.13E-01 | 2.34E-01 | 1.76E-01 | 1.31E-01 | 9.81E-02 |
| 7.41E+00 | 5.55E+00 | 4.17E+00 | 3.12E+00 | 2.34E+00 | 1.76E+00 | 1.31E+00 | 9.90E-01 | 7.42E-01 | 5.56E-01 |
| 2.00E-03 | 1.49E-03 | 1.11E-03 | 8.19E-04 | 6.08E-04 | 4.51E-04 | 3.35E-04 | 2.48E-04 | 1.85E-04 | 1.37E-04 |
| 2.06E+00 | 1.55E+00 | 1.16E+00 | 8.68E-01 | 6.51E-01 | 4.88E-01 | 3.65E-01 | 2.74E-01 | 2.05E-01 | 1.54E-01 |
| 1.97E+01 | 1.48E+01 | 1.10E+01 | 8.24E+00 | 6.17E+00 | 4.61E+00 | 3.45E+00 | 2.57E+00 | 1.93E+00 | 1.44E+00 |
| 9.54E-03 | 7.16E-03 | 5.37E-03 | 4.04E-03 | 3.03E-03 | 2.28E-03 | 1.71E-03 | 1.29E-03 | 9.63E-04 | 7.25E-04 |
| 4.98E+00 | 3.74E+00 | 2.80E+00 | 2.10E+00 | 1.58E+00 | 1.18E+00 | 8.83E-01 | 6.62E-01 | 4.96E-01 | 3.72E-01 |
| 5.88E+00 | 4.40E+00 | 3.30E+00 | 2.48E+00 | 1.85E+00 | 1.40E+00 | 1.04E+00 | 7.84E-01 | 5.88E-01 | 4.41E-01 |
| 2.16E-05 | 1.62E-05 | 1.22E-05 | 9.18E-06 | 6.88E-06 | 5.17E-06 | 3.88E-06 | 2.92E-06 | 2.20E-06 | 1.65E-06 |
| 2.04E-05 | 1.53E-05 | 1.15E-05 | 8.62E-06 | 6.47E-06 | 4.86E-06 | 3.65E-06 | 2.74E-06 | 2.05E-06 | 1.54E-06 |
| 5.56E-01 | 4.18E-01 | 3.13E-01 | 2.35E-01 | 1.76E-01 | 1.32E-01 | 9.90E-02 | 7.43E-02 | 5.57E-02 | 4.18E-02 |
| 5.82E-01 | 4.37E-01 | 3.28E-01 | 2.46E-01 | 1.84E-01 | 1.38E-01 | 1.04E-01 | 7.75E-02 | 5.81E-02 | 4.36E-02 |
| 9.00E-10 | 6.35E-10 | 4.48E-10 | 3.16E-10 | 2.23E-10 | 1.58E-10 | 1.11E-10 | 7.83E-11 | 5.53E-11 | 3.90E-11 |
| 4.14E+00 | 3.11E+00 | 2.33E+00 | 1.75E+00 | 1.31E+00 | 9.81E-01 | 7.36E-01 | 5.52E-01 | 4.14E-01 | 3.11E-01 |
| 2.71E-01 | 2.02E-01 | 1.50E-01 | 1.13E-01 | 8.40E-02 | 6.26E-02 | 4.67E-02 | 3.49E-02 | 2.60E-02 | 1.94E-02 |
| 4.15E+00 | 3.11E+00 | 2.33E+00 | 1.75E+00 | 1.31E+00 | 9.81E-01 | 7.37E-01 | 5.53E-01 | 4.15E-01 | 3.11E-01 |
| 5.71E-09 | 4.12E-09 | 2.97E-09 | 2.14E-09 | 1.55E-09 | 1.12E-09 | 8.04E-10 | 5.80E-10 | 4.19E-10 | 3.02E-10 |
| 1.25E+00 | 9.36E-01 | 7.06E-01 | 5.29E-01 | 3.97E-01 | 2.98E-01 | 2.23E-01 | 1.67E-01 | 1.25E-01 | 9.45E-02 |
| 7.84E+00 | 5.87E+00 | 4.39E+00 | 3.29E+00 | 2.47E+00 | 1.85E+00 | 1.38E+00 | 1.04E+00 | 7.73E-01 | 5.79E-01 |
| 7.61E-08 | 5.48E-08 | 3.95E-08 | 2.84E-08 | 2.05E-08 | 1.48E-08 | 1.06E-08 | 7.67E-09 | 5.53E-09 | 3.98E-09 |
| 7.74E+01 | 5.81E+01 | 4.35E+01 | 3.26E+01 | 2.45E+01 | 1.84E+01 | 1.38E+01 | 1.04E+01 | 7.74E+00 | 5.81E+00 |
| 6.42E+00 | 4.82E+00 | 3.61E+00 | 2.71E+00 | 2.03E+00 | 1.52E+00 | 1.14E+00 | 8.57E-01 | 6.43E-01 | 4.82E-01 |
| 8.50E-03 | 6.26E-03 | 4.61E-03 | 3.39E-03 | 2.50E-03 | 1.84E-03 | 1.36E-03 | 9.99E-04 | 7.34E-04 | 5.41E-04 |



|          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.29E+00 | 9.63E-01 | 7.21E-01 | 5.39E-01 | 4.03E-01 | 3.02E-01 | 2.26E-01 | 1.69E-01 | 1.26E-01 | 9.45E-02 |          |
| 1.21E+01 | 9.00E+00 | 6.75E+00 | 5.06E+00 | 3.79E+00 | 2.84E+00 | 2.12E+00 | 1.59E+00 | 1.19E+00 | 8.93E-01 |          |
| 3.39E+00 | 2.55E+00 | 1.91E+00 | 1.43E+00 | 1.07E+00 | 8.05E-01 | 6.04E-01 | 4.53E-01 | 3.39E-01 | 2.55E-01 |          |
| 8.51E+00 | 6.38E+00 | 4.79E+00 | 3.59E+00 | 2.69E+00 | 2.02E+00 | 1.51E+00 | 1.13E+00 | 8.51E-01 | 6.37E-01 |          |
| 1.31E+01 | 9.81E+00 | 7.35E+00 | 5.51E+00 | 4.13E+00 | 3.10E+00 | 2.32E+00 | 1.75E+00 | 1.31E+00 | 9.81E-01 |          |
| 5.34E-01 | 3.98E-01 | 2.97E-01 | 2.21E-01 | 1.65E-01 | 1.23E-01 | 9.18E-02 | 6.84E-02 | 5.09E-02 | 3.80E-02 |          |
| 2.37E+00 | 1.76E+00 | 1.31E+00 | 9.81E-01 | 7.33E-01 | 5.46E-01 | 4.08E-01 | 3.03E-01 | 2.27E-01 | 1.69E-01 |          |
| 1.05E+02 | 7.85E+01 | 5.88E+01 | 4.40E+01 | 3.29E+01 | 2.47E+01 | 1.85E+01 | 1.38E+01 | 1.04E+01 | 7.72E+00 |          |
| 6.63E+02 | 4.97E+02 | 3.73E+02 | 2.79E+02 | 2.09E+02 | 1.57E+02 | 1.18E+02 | 8.81E+01 | 6.61E+01 | 4.95E+01 |          |
| 6.72E+04 | 5.04E+04 | 3.77E+04 | 2.83E+04 | 2.12E+04 | 1.58E+04 | 1.19E+04 | 8.89E+03 | 6.66E+03 | 4.99E+03 |          |
| 7.79E+02 | 5.82E+02 | 4.36E+02 | 3.26E+02 | 2.43E+02 | 1.82E+02 | 1.36E+02 | 1.02E+02 | 7.60E+01 | 5.68E+01 |          |
| 1.77E+01 | 1.33E+01 | 1.01E+01 | 7.66E+00 | 5.89E+00 | 4.57E+00 | 3.60E+00 | 2.88E+00 | 2.34E+00 | 1.94E+00 |          |
| 1.98E+00 | 1.94E+00 | 1.88E+00 | 1.84E+00 | 1.78E+00 | 1.74E+00 | 1.69E+00 | 1.65E+00 | 1.61E+00 | 1.57E+00 |          |
| 2.41E+00 | 1.82E+00 | 1.37E+00 | 1.04E+00 | 7.77E-01 | 5.85E-01 | 4.41E-01 | 3.32E-01 | 2.50E-01 | 1.88E-01 |          |
| 4.95E+00 | 3.71E+00 | 2.78E+00 | 2.09E+00 | 1.57E+00 | 1.17E+00 | 8.80E-01 | 6.61E-01 | 4.95E-01 | 3.71E-01 |          |
| 5.37E-03 | 3.96E-03 | 2.92E-03 | 2.15E-03 | 1.58E-03 | 1.16E-03 | 8.58E-04 | 6.32E-04 | 4.65E-04 | 3.43E-04 |          |
| 2.76E-10 | 1.97E-10 | 1.41E-10 | 1.01E-10 | 7.20E-11 | 5.14E-11 | 3.67E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 5.95E-04 | 4.38E-04 | 3.23E-04 | 2.39E-04 | 1.76E-04 | 1.30E-04 | 9.54E-05 | 7.04E-05 | 5.19E-05 | 3.83E-05 |          |
| 6.92E+00 | 5.19E+00 | 3.90E+00 | 2.92E+00 | 2.19E+00 | 1.64E+00 | 1.23E+00 | 9.27E-01 | 6.93E-01 | 5.19E-01 |          |
| 3.51E-02 | 2.60E-02 | 1.94E-02 | 1.43E-02 | 1.06E-02 | 7.91E-03 | 5.87E-03 | 4.36E-03 | 3.24E-03 | 2.40E-03 |          |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 2:20     | 2:35     | 2:50     | 3:05     | 3:20     | 3:35     | 3:50     | 4:05     | 4:20     | 4:35     |
| 7.45E-07 | 5.60E-07 | 4.21E-07 | 3.16E-07 | 2.38E-07 | 1.78E-07 | 1.34E-07 | 1.01E-07 | 7.58E-08 | 5.70E-08 |
| 6.87E+00 | 5.15E+00 | 3.86E+00 | 2.89E+00 | 2.17E+00 | 1.63E+00 | 1.22E+00 | 9.09E-01 | 6.84E-01 | 5.13E-01 |
| 3.72E-01 | 2.79E-01 | 2.09E-01 | 1.57E-01 | 1.18E-01 | 8.81E-02 | 6.61E-02 | 4.95E-02 | 3.72E-02 | 2.78E-02 |
| 2.41E-02 | 1.80E-02 | 1.34E-02 | 9.99E-03 | 7.48E-03 | 5.58E-03 | 4.16E-03 | 3.11E-03 | 2.31E-03 | 1.73E-03 |
| 3.30E-01 | 2.48E-01 | 1.86E-01 | 1.40E-01 | 1.04E-01 | 7.85E-02 | 5.89E-02 | 4.41E-02 | 3.31E-02 | 2.48E-02 |
| 1.02E-02 | 7.64E-03 | 5.73E-03 | 4.29E-03 | 3.22E-03 | 2.42E-03 | 1.81E-03 | 1.36E-03 | 1.02E-03 | 7.64E-04 |
| 2.75E+00 | 2.06E+00 | 1.55E+00 | 1.16E+00 | 8.70E-01 | 6.53E-01 | 4.90E-01 | 3.67E-01 | 2.75E-01 | 2.06E-01 |
| 8.43E-01 | 6.33E-01 | 4.74E-01 | 3.56E-01 | 2.66E-01 | 2.00E-01 | 1.49E-01 | 1.13E-01 | 8.41E-02 | 6.30E-02 |
| 1.91E+00 | 1.43E+00 | 1.07E+00 | 8.06E-01 | 6.05E-01 | 4.54E-01 | 3.40E-01 | 2.55E-01 | 1.92E-01 | 1.43E-01 |
| 1.19E+01 | 8.91E+00 | 6.68E+00 | 5.00E+00 | 3.75E+00 | 2.81E+00 | 2.11E+00 | 1.58E+00 | 1.18E+00 | 8.86E-01 |
| 5.95E+00 | 4.46E+00 | 3.33E+00 | 2.49E+00 | 1.86E+00 | 1.40E+00 | 1.04E+00 | 7.82E-01 | 5.86E-01 | 4.38E-01 |
| 4.68E-01 | 3.48E-01 | 2.59E-01 | 1.93E-01 | 1.43E-01 | 1.06E-01 | 7.92E-02 | 5.89E-02 | 4.38E-02 | 3.26E-02 |
| 3.57E-05 | 2.61E-05 | 1.91E-05 | 1.40E-05 | 1.02E-05 | 7.43E-06 | 5.43E-06 | 3.97E-06 | 2.90E-06 | 2.12E-06 |
| 3.02E+01 | 2.27E+01 | 1.70E+01 | 1.28E+01 | 9.54E+00 | 7.16E+00 | 5.37E+00 | 4.03E+00 | 3.02E+00 | 2.27E+00 |
| 1.30E-06 | 9.36E-07 | 6.73E-07 | 4.85E-07 | 3.50E-07 | 2.53E-07 | 1.83E-07 | 1.31E-07 | 9.54E-08 | 6.86E-08 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.82E+00 | 2.87E+00 | 2.16E+00 | 1.63E+00 | 1.22E+00 | 9.18E-01 | 6.93E-01 | 5.22E-01 | 3.92E-01 | 2.95E-01 |
| 3.49E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 7.33E-02 | 5.48E-02 | 4.10E-02 | 3.07E-02 | 2.30E-02 | 1.72E-02 | 1.29E-02 | 9.63E-03 | 7.18E-03 | 5.37E-03 |
| 4.17E-01 | 3.13E-01 | 2.35E-01 | 1.76E-01 | 1.32E-01 | 9.90E-02 | 7.43E-02 | 5.57E-02 | 4.18E-02 | 3.13E-02 |
| 1.02E-04 | 7.55E-05 | 5.61E-05 | 4.16E-05 | 3.09E-05 | 2.30E-05 | 1.70E-05 | 1.26E-05 | 9.36E-06 | 6.97E-06 |
| 1.15E-01 | 8.64E-02 | 6.48E-02 | 4.86E-02 | 3.64E-02 | 2.73E-02 | 2.04E-02 | 1.53E-02 | 1.15E-02 | 8.60E-03 |
| 1.08E+00 | 8.05E-01 | 6.02E-01 | 4.50E-01 | 3.37E-01 | 2.52E-01 | 1.88E-01 | 1.40E-01 | 1.05E-01 | 7.87E-02 |
| 5.45E-04 | 4.10E-04 | 3.08E-04 | 2.31E-04 | 1.74E-04 | 1.31E-04 | 9.81E-05 | 7.36E-05 | 5.53E-05 | 4.15E-05 |
| 2.79E-01 | 2.09E-01 | 1.57E-01 | 1.17E-01 | 8.80E-02 | 6.60E-02 | 4.95E-02 | 3.71E-02 | 2.78E-02 | 2.08E-02 |
| 3.30E-01 | 2.48E-01 | 1.86E-01 | 1.40E-01 | 1.04E-01 | 7.85E-02 | 5.89E-02 | 4.41E-02 | 3.31E-02 | 2.48E-02 |
| 1.24E-06 | 9.27E-07 | 6.98E-07 | 5.25E-07 | 3.94E-07 | 2.96E-07 | 2.22E-07 | 1.67E-07 | 1.26E-07 | 9.45E-08 |
| 1.16E-06 | 8.69E-07 | 6.52E-07 | 4.90E-07 | 3.67E-07 | 2.75E-07 | 2.07E-07 | 1.56E-07 | 1.17E-07 | 8.75E-08 |
| 3.13E-02 | 2.35E-02 | 1.76E-02 | 1.32E-02 | 9.90E-03 | 7.43E-03 | 5.58E-03 | 4.19E-03 | 3.14E-03 | 2.35E-03 |
| 3.27E-02 | 2.45E-02 | 1.84E-02 | 1.38E-02 | 1.04E-02 | 7.74E-03 | 5.80E-03 | 4.35E-03 | 3.26E-03 | 2.45E-03 |
| 2.75E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.33E-01 | 1.75E-01 | 1.31E-01 | 9.81E-02 | 7.36E-02 | 5.52E-02 | 4.14E-02 | 3.11E-02 | 2.32E-02 | 1.75E-02 |
| 1.45E-02 | 1.08E-02 | 8.08E-03 | 6.03E-03 | 4.50E-03 | 3.36E-03 | 2.51E-03 | 1.87E-03 | 1.40E-03 | 1.04E-03 |
| 2.33E-01 | 1.75E-01 | 1.31E-01 | 9.81E-02 | 7.37E-02 | 5.53E-02 | 4.15E-02 | 3.11E-02 | 2.33E-02 | 1.75E-02 |
| 2.18E-10 | 1.57E-10 | 1.13E-10 | 8.16E-11 | 5.90E-11 | 4.25E-11 | 3.07E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 7.06E-02 | 5.29E-02 | 3.97E-02 | 2.98E-02 | 2.23E-02 | 1.67E-02 | 1.26E-02 | 9.45E-03 | 7.07E-03 | 5.30E-03 |
| 4.34E-01 | 3.24E-01 | 2.43E-01 | 1.82E-01 | 1.36E-01 | 1.02E-01 | 7.62E-02 | 5.71E-02 | 4.28E-02 | 3.20E-02 |
| 2.87E-09 | 2.07E-09 | 1.49E-09 | 1.07E-09 | 7.73E-10 | 5.57E-10 | 4.01E-10 | 2.89E-10 | 2.09E-10 | 1.50E-10 |
| 4.35E+00 | 3.26E+00 | 2.45E+00 | 1.84E+00 | 1.38E+00 | 1.04E+00 | 7.73E-01 | 5.81E-01 | 4.35E-01 | 3.26E-01 |
| 3.62E-01 | 2.71E-01 | 2.03E-01 | 1.52E-01 | 1.14E-01 | 8.58E-02 | 6.44E-02 | 4.82E-02 | 3.62E-02 | 2.72E-02 |
| 3.99E-04 | 2.93E-04 | 2.16E-04 | 1.59E-04 | 1.17E-04 | 8.63E-05 | 6.35E-05 | 4.68E-05 | 3.45E-05 | 2.54E-05 |

|          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 7.07E-02 | 5.28E-02 | 3.95E-02 | 2.96E-02 | 2.21E-02 | 1.66E-02 | 1.23E-02 | 9.27E-03 | 6.92E-03 | 5.18E-03 |          |
| 6.69E-01 | 5.01E-01 | 3.75E-01 | 2.81E-01 | 2.11E-01 | 1.58E-01 | 1.18E-01 | 8.85E-02 | 6.62E-02 | 4.96E-02 |          |
| 1.91E-01 | 1.43E-01 | 1.07E-01 | 8.06E-02 | 6.04E-02 | 4.53E-02 | 3.40E-02 | 2.55E-02 | 1.91E-02 | 1.43E-02 |          |
| 4.78E-01 | 3.58E-01 | 2.69E-01 | 2.02E-01 | 1.51E-01 | 1.13E-01 | 8.50E-02 | 6.37E-02 | 4.78E-02 | 3.58E-02 |          |
| 7.34E-01 | 5.51E-01 | 4.13E-01 | 3.10E-01 | 2.32E-01 | 1.74E-01 | 1.31E-01 | 9.81E-02 | 7.34E-02 | 5.51E-02 |          |
| 2.84E-02 | 2.12E-02 | 1.58E-02 | 1.18E-02 | 8.77E-03 | 6.53E-03 | 4.88E-03 | 3.64E-03 | 2.71E-03 | 2.03E-03 |          |
| 1.26E-01 | 9.36E-02 | 7.00E-02 | 5.22E-02 | 3.90E-02 | 2.91E-02 | 2.17E-02 | 1.61E-02 | 1.21E-02 | 8.97E-03 |          |
| 5.78E+00 | 4.32E+00 | 3.24E+00 | 2.42E+00 | 1.81E+00 | 1.36E+00 | 1.02E+00 | 7.60E-01 | 5.68E-01 | 4.26E-01 |          |
| 3.71E+01 | 2.78E+01 | 2.09E+01 | 1.57E+01 | 1.17E+01 | 8.78E+00 | 6.58E+00 | 4.93E+00 | 3.70E+00 | 2.77E+00 |          |
| 3.74E+03 | 2.80E+03 | 2.10E+03 | 1.57E+03 | 1.18E+03 | 8.81E+02 | 6.60E+02 | 4.94E+02 | 3.70E+02 | 2.77E+02 |          |
| 4.25E+01 | 3.18E+01 | 2.38E+01 | 1.77E+01 | 1.32E+01 | 9.90E+00 | 7.41E+00 | 5.54E+00 | 4.14E+00 | 3.10E+00 |          |
| 1.64E+00 | 1.41E+00 | 1.24E+00 | 1.11E+00 | 1.01E+00 | 9.27E-01 | 8.66E-01 | 8.14E-01 | 7.71E-01 | 7.35E-01 |          |
| 1.52E+00 | 1.49E+00 | 1.45E+00 | 1.41E+00 | 1.37E+00 | 1.34E+00 | 1.31E+00 | 1.27E+00 | 1.23E+00 | 1.21E+00 |          |
| 1.42E-01 | 1.07E-01 | 8.05E-02 | 6.06E-02 | 4.56E-02 | 3.44E-02 | 2.59E-02 | 1.95E-02 | 1.47E-02 | 1.11E-02 |          |
| 2.78E-01 | 2.09E-01 | 1.57E-01 | 1.17E-01 | 8.80E-02 | 6.61E-02 | 4.95E-02 | 3.72E-02 | 2.78E-02 | 2.09E-02 |          |
| 2.52E-04 | 1.85E-04 | 1.37E-04 | 1.01E-04 | 7.43E-05 | 5.46E-05 | 4.02E-05 | 2.96E-05 | 2.19E-05 | 1.61E-05 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 2.83E-05 | 2.08E-05 | 1.53E-05 | 1.13E-05 | 8.33E-06 | 6.15E-06 | 4.53E-06 | 3.34E-06 | 2.47E-06 | 1.82E-06 |          |
| 3.90E-01 | 2.93E-01 | 2.19E-01 | 1.65E-01 | 1.23E-01 | 9.27E-02 | 6.93E-02 | 5.19E-02 | 3.90E-02 | 2.93E-02 |          |
| 1.78E-03 | 1.32E-03 | 9.81E-04 | 7.29E-04 | 5.42E-04 | 4.02E-04 | 2.99E-04 | 2.21E-04 | 1.65E-04 | 1.22E-04 |          |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 4:50     | 5:05     | 5:20     | 5:35     | 5:50     | 6:05     | 6:20     | 6:35     | 6:50     | 7:05     |
| 4.28E-08 | 3.21E-08 | 2.41E-08 | 1.82E-08 | 1.37E-08 | 1.03E-08 | 7.70E-09 | 5.79E-09 | 4.35E-09 | 3.27E-09 |
| 3.84E-01 | 2.88E-01 | 2.16E-01 | 1.62E-01 | 1.22E-01 | 9.09E-02 | 6.82E-02 | 5.11E-02 | 3.83E-02 | 2.87E-02 |
| 2.09E-02 | 1.57E-02 | 1.17E-02 | 8.80E-03 | 6.60E-03 | 4.95E-03 | 3.71E-03 | 2.78E-03 | 2.09E-03 | 1.57E-03 |
| 1.29E-03 | 9.63E-04 | 7.17E-04 | 5.36E-04 | 4.00E-04 | 2.98E-04 | 2.22E-04 | 1.66E-04 | 1.24E-04 | 9.27E-05 |
| 1.86E-02 | 1.40E-02 | 1.04E-02 | 7.86E-03 | 5.89E-03 | 4.42E-03 | 3.31E-03 | 2.48E-03 | 1.86E-03 | 1.40E-03 |
| 5.73E-04 | 4.30E-04 | 3.22E-04 | 2.42E-04 | 1.82E-04 | 1.36E-04 | 1.02E-04 | 7.65E-05 | 5.74E-05 | 4.30E-05 |
| 1.55E-01 | 1.16E-01 | 8.71E-02 | 6.53E-02 | 4.91E-02 | 3.67E-02 | 2.75E-02 | 2.07E-02 | 1.55E-02 | 1.16E-02 |
| 4.73E-02 | 3.54E-02 | 2.66E-02 | 1.99E-02 | 1.49E-02 | 1.12E-02 | 8.38E-03 | 6.28E-03 | 4.71E-03 | 3.53E-03 |
| 1.08E-01 | 8.07E-02 | 6.06E-02 | 4.55E-02 | 3.40E-02 | 2.56E-02 | 1.92E-02 | 1.44E-02 | 1.08E-02 | 8.08E-03 |
| 6.63E-01 | 4.98E-01 | 3.73E-01 | 2.79E-01 | 2.10E-01 | 1.57E-01 | 1.18E-01 | 8.80E-02 | 6.60E-02 | 4.94E-02 |
| 3.28E-01 | 2.46E-01 | 1.84E-01 | 1.38E-01 | 1.03E-01 | 7.70E-02 | 5.76E-02 | 4.31E-02 | 3.22E-02 | 2.41E-02 |
| 2.42E-02 | 1.80E-02 | 1.34E-02 | 9.99E-03 | 7.42E-03 | 5.52E-03 | 4.10E-03 | 3.05E-03 | 2.27E-03 | 1.69E-03 |
| 1.55E-06 | 1.13E-06 | 8.25E-07 | 6.03E-07 | 4.41E-07 | 3.22E-07 | 2.35E-07 | 1.72E-07 | 1.25E-07 | 9.18E-08 |
| 1.70E+00 | 1.28E+00 | 9.54E-01 | 7.17E-01 | 5.38E-01 | 4.04E-01 | 3.02E-01 | 2.27E-01 | 1.70E-01 | 1.28E-01 |
| 4.95E-08 | 3.57E-08 | 2.57E-08 | 1.85E-08 | 1.34E-08 | 9.72E-09 | 6.98E-09 | 5.04E-09 | 3.64E-09 | 2.62E-09 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.22E-01 | 1.67E-01 | 1.26E-01 | 9.45E-02 | 7.12E-02 | 5.36E-02 | 4.02E-02 | 3.03E-02 | 2.28E-02 | 1.71E-02 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.02E-03 | 3.01E-03 | 2.25E-03 | 1.68E-03 | 1.26E-03 | 9.45E-04 | 7.04E-04 | 5.27E-04 | 3.94E-04 | 2.94E-04 |
| 2.35E-02 | 1.76E-02 | 1.32E-02 | 9.90E-03 | 7.43E-03 | 5.57E-03 | 4.18E-03 | 3.13E-03 | 2.35E-03 | 1.76E-03 |
| 5.18E-06 | 3.84E-06 | 2.85E-06 | 2.12E-06 | 1.57E-06 | 1.17E-06 | 8.66E-07 | 6.43E-07 | 4.77E-07 | 3.54E-07 |
| 6.45E-03 | 4.83E-03 | 3.63E-03 | 2.72E-03 | 2.03E-03 | 1.53E-03 | 1.14E-03 | 8.58E-04 | 6.43E-04 | 4.82E-04 |
| 5.88E-02 | 4.40E-02 | 3.29E-02 | 2.46E-02 | 1.84E-02 | 1.38E-02 | 1.03E-02 | 7.69E-03 | 5.74E-03 | 4.29E-03 |
| 3.12E-05 | 2.34E-05 | 1.76E-05 | 1.32E-05 | 9.90E-06 | 7.46E-06 | 5.61E-06 | 4.21E-06 | 3.16E-06 | 2.38E-06 |
| 1.57E-02 | 1.17E-02 | 8.78E-03 | 6.58E-03 | 4.93E-03 | 3.70E-03 | 2.77E-03 | 2.08E-03 | 1.56E-03 | 1.17E-03 |
| 1.86E-02 | 1.40E-02 | 1.04E-02 | 7.86E-03 | 5.89E-03 | 4.42E-03 | 3.31E-03 | 2.48E-03 | 1.86E-03 | 1.40E-03 |
| 7.10E-08 | 5.34E-08 | 4.01E-08 | 3.02E-08 | 2.26E-08 | 1.70E-08 | 1.28E-08 | 9.63E-09 | 7.21E-09 | 5.42E-09 |
| 6.57E-08 | 4.93E-08 | 3.70E-08 | 2.77E-08 | 2.08E-08 | 1.57E-08 | 1.17E-08 | 8.81E-09 | 6.62E-09 | 4.96E-09 |
| 1.76E-03 | 1.32E-03 | 9.90E-04 | 7.44E-04 | 5.58E-04 | 4.19E-04 | 3.14E-04 | 2.36E-04 | 1.76E-04 | 1.32E-04 |
| 1.84E-03 | 1.38E-03 | 1.03E-03 | 7.72E-04 | 5.79E-04 | 4.34E-04 | 3.26E-04 | 2.44E-04 | 1.83E-04 | 1.37E-04 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.31E-02 | 9.81E-03 | 7.35E-03 | 5.52E-03 | 4.14E-03 | 3.11E-03 | 2.32E-03 | 1.75E-03 | 1.31E-03 | 9.81E-04 |
| 7.78E-04 | 5.81E-04 | 4.33E-04 | 3.23E-04 | 2.41E-04 | 1.80E-04 | 1.34E-04 | 9.99E-05 | 7.49E-05 | 5.59E-05 |
| 1.31E-02 | 9.81E-03 | 7.37E-03 | 5.53E-03 | 4.14E-03 | 3.11E-03 | 2.33E-03 | 1.75E-03 | 1.31E-03 | 9.81E-04 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.98E-03 | 2.98E-03 | 2.23E-03 | 1.67E-03 | 1.26E-03 | 9.45E-04 | 7.07E-04 | 5.30E-04 | 3.98E-04 | 2.99E-04 |
| 2.39E-02 | 1.79E-02 | 1.34E-02 | 1.01E-02 | 7.52E-03 | 5.63E-03 | 4.21E-03 | 3.16E-03 | 2.36E-03 | 1.76E-03 |
| 1.08E-10 | 7.79E-11 | 5.62E-11 | 4.05E-11 | 2.92E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.45E-01 | 1.84E-01 | 1.38E-01 | 1.04E-01 | 7.73E-02 | 5.81E-02 | 4.35E-02 | 3.26E-02 | 2.45E-02 | 1.84E-02 |
| 2.03E-02 | 1.53E-02 | 1.14E-02 | 8.59E-03 | 6.44E-03 | 4.83E-03 | 3.63E-03 | 2.72E-03 | 2.03E-03 | 1.53E-03 |
| 1.87E-05 | 1.38E-05 | 1.02E-05 | 7.47E-06 | 5.50E-06 | 4.05E-06 | 2.99E-06 | 2.20E-06 | 1.62E-06 | 1.19E-06 |

|          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.88E-03 | 2.90E-03 | 2.17E-03 | 1.62E-03 | 1.22E-03 | 9.09E-04 | 6.79E-04 | 5.08E-04 | 3.80E-04 | 2.84E-04 |          |
| 3.72E-02 | 2.78E-02 | 2.09E-02 | 1.56E-02 | 1.17E-02 | 8.76E-03 | 6.56E-03 | 4.91E-03 | 3.68E-03 | 2.75E-03 |          |
| 1.07E-02 | 8.06E-03 | 6.05E-03 | 4.54E-03 | 3.40E-03 | 2.55E-03 | 1.92E-03 | 1.43E-03 | 1.08E-03 | 8.07E-04 |          |
| 2.69E-02 | 2.02E-02 | 1.51E-02 | 1.13E-02 | 8.50E-03 | 6.37E-03 | 4.78E-03 | 3.58E-03 | 2.68E-03 | 2.02E-03 |          |
| 4.13E-02 | 3.10E-02 | 2.32E-02 | 1.74E-02 | 1.31E-02 | 9.81E-03 | 7.34E-03 | 5.50E-03 | 4.12E-03 | 3.10E-03 |          |
| 1.50E-03 | 1.13E-03 | 8.38E-04 | 6.25E-04 | 4.66E-04 | 3.47E-04 | 2.59E-04 | 1.94E-04 | 1.44E-04 | 1.07E-04 |          |
| 6.70E-03 | 5.00E-03 | 3.73E-03 | 2.77E-03 | 2.07E-03 | 1.54E-03 | 1.15E-03 | 8.58E-04 | 6.40E-04 | 4.77E-04 |          |
| 3.19E-01 | 2.39E-01 | 1.78E-01 | 1.33E-01 | 9.99E-02 | 7.47E-02 | 5.59E-02 | 4.19E-02 | 3.13E-02 | 2.34E-02 |          |
| 2.08E+00 | 1.56E+00 | 1.17E+00 | 8.75E-01 | 6.55E-01 | 4.91E-01 | 3.68E-01 | 2.76E-01 | 2.07E-01 | 1.55E-01 |          |
| 2.08E+02 | 1.56E+02 | 1.16E+02 | 8.72E+01 | 6.53E+01 | 4.90E+01 | 3.66E+01 | 2.75E+01 | 2.05E+01 | 1.54E+01 |          |
| 2.31E+00 | 1.73E+00 | 1.30E+00 | 9.63E-01 | 7.22E-01 | 5.40E-01 | 4.03E-01 | 3.02E-01 | 2.26E-01 | 1.68E-01 |          |
| 7.05E-01 | 6.78E-01 | 6.54E-01 | 6.33E-01 | 6.13E-01 | 5.94E-01 | 5.77E-01 | 5.61E-01 | 5.45E-01 | 5.30E-01 |          |
| 1.17E+00 | 1.14E+00 | 1.12E+00 | 1.08E+00 | 1.05E+00 | 1.03E+00 | 9.99E-01 | 9.72E-01 | 9.54E-01 | 9.27E-01 |          |
| 8.32E-03 | 6.26E-03 | 4.72E-03 | 3.56E-03 | 2.67E-03 | 2.02E-03 | 1.51E-03 | 1.14E-03 | 8.59E-04 | 6.46E-04 |          |
| 1.57E-02 | 1.17E-02 | 8.80E-03 | 6.61E-03 | 4.95E-03 | 3.72E-03 | 2.78E-03 | 2.09E-03 | 1.57E-03 | 1.17E-03 |          |
| 1.19E-05 | 8.72E-06 | 6.43E-06 | 4.73E-06 | 3.48E-06 | 2.57E-06 | 1.89E-06 | 1.40E-06 | 1.03E-06 | 7.54E-07 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 1.34E-06 | 9.90E-07 | 7.27E-07 | 5.36E-07 | 3.95E-07 | 2.92E-07 | 2.15E-07 | 1.58E-07 | 1.17E-07 | 8.61E-08 |          |
| 2.19E-02 | 1.65E-02 | 1.23E-02 | 9.27E-03 | 6.93E-03 | 5.19E-03 | 3.90E-03 | 2.93E-03 | 2.19E-03 | 1.65E-03 |          |
| 9.09E-05 | 6.72E-05 | 5.00E-05 | 3.71E-05 | 2.75E-05 | 2.04E-05 | 1.52E-05 | 1.13E-05 | 8.36E-06 | 6.20E-06 |          |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | ##### |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------|
| 7:20     | 7:35     | 7:50     | 8:05     | 8:20     | 8:35     | 8:50     | 9:05     | 9:20     | 9:35     |       |
| 2.46E-09 | 1.85E-09 | 1.39E-09 | 1.04E-09 | 7.82E-10 | 5.88E-10 | 4.42E-10 | 3.32E-10 | 2.49E-10 | 1.87E-10 |       |
| 2.15E-02 | 1.61E-02 | 1.21E-02 | 9.09E-03 | 6.80E-03 | 5.09E-03 | 3.82E-03 | 2.86E-03 | 2.14E-03 | 1.61E-03 |       |
| 1.17E-03 | 8.79E-04 | 6.60E-04 | 4.95E-04 | 3.71E-04 | 2.78E-04 | 2.09E-04 | 1.57E-04 | 1.17E-04 | 8.79E-05 |       |
| 6.89E-05 | 5.14E-05 | 3.83E-05 | 2.86E-05 | 2.13E-05 | 1.59E-05 | 1.19E-05 | 8.87E-06 | 6.62E-06 | 4.93E-06 |       |
| 1.04E-03 | 7.86E-04 | 5.90E-04 | 4.42E-04 | 3.31E-04 | 2.48E-04 | 1.86E-04 | 1.40E-04 | 1.05E-04 | 7.87E-05 |       |
| 3.23E-05 | 2.42E-05 | 1.82E-05 | 1.36E-05 | 1.02E-05 | 7.66E-06 | 5.74E-06 | 4.31E-06 | 3.23E-06 | 2.42E-06 |       |
| 8.72E-03 | 6.54E-03 | 4.91E-03 | 3.68E-03 | 2.76E-03 | 2.07E-03 | 1.55E-03 | 1.16E-03 | 8.73E-04 | 6.55E-04 |       |
| 2.65E-03 | 1.98E-03 | 1.49E-03 | 1.12E-03 | 8.35E-04 | 6.26E-04 | 4.69E-04 | 3.52E-04 | 2.64E-04 | 1.98E-04 |       |
| 6.06E-03 | 4.55E-03 | 3.41E-03 | 2.56E-03 | 1.92E-03 | 1.44E-03 | 1.08E-03 | 8.09E-04 | 6.07E-04 | 4.55E-04 |       |
| 3.71E-02 | 2.77E-02 | 2.08E-02 | 1.56E-02 | 1.17E-02 | 8.75E-03 | 6.56E-03 | 4.91E-03 | 3.68E-03 | 2.76E-03 |       |
| 1.81E-02 | 1.35E-02 | 1.01E-02 | 7.57E-03 | 5.66E-03 | 4.24E-03 | 3.17E-03 | 2.38E-03 | 1.77E-03 | 1.33E-03 |       |
| 1.26E-03 | 9.36E-04 | 6.95E-04 | 5.17E-04 | 3.84E-04 | 2.86E-04 | 2.12E-04 | 1.58E-04 | 1.18E-04 | 8.75E-05 |       |
| 6.70E-08 | 4.90E-08 | 3.57E-08 | 2.61E-08 | 1.91E-08 | 1.40E-08 | 1.02E-08 | 7.44E-09 | 5.44E-09 | 3.97E-09 |       |
| 9.54E-02 | 7.18E-02 | 5.39E-02 | 4.04E-02 | 3.03E-02 | 2.28E-02 | 1.70E-02 | 1.28E-02 | 9.63E-03 | 7.19E-03 |       |
| 1.89E-09 | 1.37E-09 | 9.90E-10 | 7.11E-10 | 5.13E-10 | 3.71E-10 | 2.67E-10 | 1.93E-10 | 1.40E-10 | 1.01E-10 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 1.29E-02 | 9.72E-03 | 7.29E-03 | 5.49E-03 | 4.12E-03 | 3.11E-03 | 2.33E-03 | 1.76E-03 | 1.32E-03 | 9.90E-04 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 2.21E-04 | 1.65E-04 | 1.23E-04 | 9.27E-05 | 6.90E-05 | 5.17E-05 | 3.86E-05 | 2.89E-05 | 2.16E-05 | 1.62E-05 |       |
| 1.32E-03 | 9.90E-04 | 7.43E-04 | 5.58E-04 | 4.19E-04 | 3.14E-04 | 2.35E-04 | 1.76E-04 | 1.32E-04 | 9.90E-05 |       |
| 2.63E-07 | 1.95E-07 | 1.45E-07 | 1.07E-07 | 7.98E-08 | 5.92E-08 | 4.40E-08 | 3.27E-08 | 2.42E-08 | 1.80E-08 |       |
| 3.61E-04 | 2.71E-04 | 2.03E-04 | 1.52E-04 | 1.14E-04 | 8.54E-05 | 6.40E-05 | 4.80E-05 | 3.59E-05 | 2.69E-05 |       |
| 3.21E-03 | 2.40E-03 | 1.80E-03 | 1.34E-03 | 1.01E-03 | 7.51E-04 | 5.62E-04 | 4.19E-04 | 3.14E-04 | 2.35E-04 |       |
| 1.78E-06 | 1.34E-06 | 1.01E-06 | 7.56E-07 | 5.68E-07 | 4.27E-07 | 3.20E-07 | 2.40E-07 | 1.81E-07 | 1.36E-07 |       |
| 8.75E-04 | 6.56E-04 | 4.91E-04 | 3.68E-04 | 2.76E-04 | 2.07E-04 | 1.55E-04 | 1.16E-04 | 8.72E-05 | 6.53E-05 |       |
| 1.04E-03 | 7.86E-04 | 5.90E-04 | 4.42E-04 | 3.31E-04 | 2.48E-04 | 1.86E-04 | 1.40E-04 | 1.05E-04 | 7.87E-05 |       |
| 4.07E-09 | 3.06E-09 | 2.30E-09 | 1.73E-09 | 1.30E-09 | 9.72E-10 | 7.33E-10 | 5.50E-10 | 4.13E-10 | 3.11E-10 |       |
| 3.73E-09 | 2.80E-09 | 2.10E-09 | 1.58E-09 | 1.18E-09 | 8.87E-10 | 6.66E-10 | 5.00E-10 | 3.75E-10 | 2.82E-10 |       |
| 9.90E-05 | 7.45E-05 | 5.59E-05 | 4.19E-05 | 3.14E-05 | 2.36E-05 | 1.76E-05 | 1.32E-05 | 9.99E-06 | 7.46E-06 |       |
| 1.03E-04 | 7.70E-05 | 5.78E-05 | 4.33E-05 | 3.25E-05 | 2.44E-05 | 1.83E-05 | 1.37E-05 | 1.03E-05 | 7.70E-06 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 7.35E-04 | 5.52E-04 | 4.13E-04 | 3.10E-04 | 2.32E-04 | 1.75E-04 | 1.31E-04 | 9.81E-05 | 7.35E-05 | 5.51E-05 |       |
| 4.17E-05 | 3.11E-05 | 2.32E-05 | 1.74E-05 | 1.30E-05 | 9.63E-06 | 7.21E-06 | 5.38E-06 | 4.01E-06 | 3.00E-06 |       |
| 7.37E-04 | 5.53E-04 | 4.14E-04 | 3.11E-04 | 2.33E-04 | 1.75E-04 | 1.31E-04 | 9.81E-05 | 7.36E-05 | 5.53E-05 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 2.24E-04 | 1.67E-04 | 1.26E-04 | 9.45E-05 | 7.08E-05 | 5.31E-05 | 3.98E-05 | 2.99E-05 | 2.24E-05 | 1.68E-05 |       |
| 1.32E-03 | 9.90E-04 | 7.42E-04 | 5.55E-04 | 4.16E-04 | 3.11E-04 | 2.33E-04 | 1.75E-04 | 1.31E-04 | 9.81E-05 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 1.38E-02 | 1.04E-02 | 7.73E-03 | 5.81E-03 | 4.35E-03 | 3.26E-03 | 2.45E-03 | 1.84E-03 | 1.38E-03 | 1.04E-03 |       |
| 1.14E-03 | 8.60E-04 | 6.44E-04 | 4.83E-04 | 3.63E-04 | 2.72E-04 | 2.04E-04 | 1.53E-04 | 1.15E-04 | 8.60E-05 |       |
| 8.78E-07 | 6.46E-07 | 4.76E-07 | 3.51E-07 | 2.58E-07 | 1.90E-07 | 1.40E-07 | 1.04E-07 | 7.60E-08 | 5.59E-08 |       |

|          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.12E-04 | 1.59E-04 | 1.19E-04 | 8.89E-05 | 6.65E-05 | 4.98E-05 | 3.73E-05 | 2.78E-05 | 2.09E-05 | 1.56E-05 |          |
| 2.06E-03 | 1.55E-03 | 1.16E-03 | 8.68E-04 | 6.50E-04 | 4.87E-04 | 3.65E-04 | 2.73E-04 | 2.04E-04 | 1.53E-04 |          |
| 6.05E-04 | 4.54E-04 | 3.40E-04 | 2.56E-04 | 1.92E-04 | 1.44E-04 | 1.08E-04 | 8.07E-05 | 6.06E-05 | 4.55E-05 |          |
| 1.51E-03 | 1.13E-03 | 8.49E-04 | 6.36E-04 | 4.77E-04 | 3.58E-04 | 2.68E-04 | 2.02E-04 | 1.51E-04 | 1.13E-04 |          |
| 2.32E-03 | 1.74E-03 | 1.31E-03 | 9.81E-04 | 7.34E-04 | 5.50E-04 | 4.12E-04 | 3.09E-04 | 2.32E-04 | 1.74E-04 |          |
| 8.01E-05 | 5.98E-05 | 4.46E-05 | 3.32E-05 | 2.48E-05 | 1.85E-05 | 1.38E-05 | 1.03E-05 | 7.66E-06 | 5.71E-06 |          |
| 3.56E-04 | 2.66E-04 | 1.98E-04 | 1.48E-04 | 1.10E-04 | 8.20E-05 | 6.12E-05 | 4.56E-05 | 3.40E-05 | 2.54E-05 |          |
| 1.76E-02 | 1.31E-02 | 9.81E-03 | 7.34E-03 | 5.50E-03 | 4.11E-03 | 3.08E-03 | 2.30E-03 | 1.73E-03 | 1.29E-03 |          |
| 1.16E-01 | 8.71E-02 | 6.53E-02 | 4.90E-02 | 3.67E-02 | 2.75E-02 | 2.06E-02 | 1.55E-02 | 1.16E-02 | 8.68E-03 |          |
| 1.15E+01 | 8.64E+00 | 6.47E+00 | 4.84E+00 | 3.63E+00 | 2.72E+00 | 2.03E+00 | 1.52E+00 | 1.14E+00 | 8.55E-01 |          |
| 1.26E-01 | 9.45E-02 | 7.04E-02 | 5.27E-02 | 3.93E-02 | 2.94E-02 | 2.20E-02 | 1.65E-02 | 1.23E-02 | 9.18E-03 |          |
| 5.16E-01 | 5.02E-01 | 4.89E-01 | 4.76E-01 | 4.64E-01 | 4.52E-01 | 4.39E-01 | 4.28E-01 | 4.17E-01 | 4.06E-01 |          |
| 9.00E-01 | 8.78E-01 | 8.56E-01 | 8.33E-01 | 8.12E-01 | 7.91E-01 | 7.70E-01 | 7.51E-01 | 7.31E-01 | 7.12E-01 |          |
| 4.87E-04 | 3.66E-04 | 2.75E-04 | 2.08E-04 | 1.57E-04 | 1.18E-04 | 8.85E-05 | 6.66E-05 | 5.01E-05 | 3.77E-05 |          |
| 8.81E-04 | 6.61E-04 | 4.95E-04 | 3.72E-04 | 2.78E-04 | 2.09E-04 | 1.57E-04 | 1.18E-04 | 8.81E-05 | 6.61E-05 |          |
| 5.55E-07 | 4.10E-07 | 3.02E-07 | 2.22E-07 | 1.64E-07 | 1.21E-07 | 8.87E-08 | 6.53E-08 | 4.81E-08 | 3.54E-08 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 6.35E-08 | 4.68E-08 | 3.46E-08 | 2.55E-08 | 1.87E-08 | 1.39E-08 | 1.02E-08 | 7.52E-09 | 5.54E-09 | 4.09E-09 |          |
| 1.23E-03 | 9.27E-04 | 6.93E-04 | 5.19E-04 | 3.90E-04 | 2.93E-04 | 2.20E-04 | 1.65E-04 | 1.23E-04 | 9.27E-05 |          |
| 4.61E-06 | 3.42E-06 | 2.54E-06 | 1.88E-06 | 1.40E-06 | 1.04E-06 | 7.70E-07 | 5.72E-07 | 4.25E-07 | 3.15E-07 |          |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 9:50     | 10:05    | 10:20    | 10:35    | 10:50    | 11:05    | 11:20    | 11:35    | 11:50    | 12:05    |
| 1.40E-10 | 1.06E-10 | 7.95E-11 | 5.97E-11 | 4.49E-11 | 3.38E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.21E-03 | 9.00E-04 | 6.78E-04 | 5.08E-04 | 3.81E-04 | 2.85E-04 | 2.14E-04 | 1.60E-04 | 1.21E-04 | 9.00E-05 |
| 6.59E-05 | 4.94E-05 | 3.71E-05 | 2.78E-05 | 2.09E-05 | 1.57E-05 | 1.17E-05 | 8.78E-06 | 6.59E-06 | 4.94E-06 |
| 3.68E-06 | 2.75E-06 | 2.05E-06 | 1.53E-06 | 1.14E-06 | 8.51E-07 | 6.35E-07 | 4.74E-07 | 3.54E-07 | 2.64E-07 |
| 5.90E-05 | 4.43E-05 | 3.32E-05 | 2.49E-05 | 1.86E-05 | 1.40E-05 | 1.05E-05 | 7.88E-06 | 5.90E-06 | 4.43E-06 |
| 1.82E-06 | 1.36E-06 | 1.03E-06 | 7.66E-07 | 5.75E-07 | 4.31E-07 | 3.23E-07 | 2.42E-07 | 1.82E-07 | 1.36E-07 |
| 4.91E-04 | 3.68E-04 | 2.76E-04 | 2.07E-04 | 1.56E-04 | 1.16E-04 | 8.74E-05 | 6.55E-05 | 4.91E-05 | 3.69E-05 |
| 1.49E-04 | 1.11E-04 | 8.33E-05 | 6.24E-05 | 4.68E-05 | 3.51E-05 | 2.63E-05 | 1.97E-05 | 1.48E-05 | 1.11E-05 |
| 3.41E-04 | 2.56E-04 | 1.92E-04 | 1.44E-04 | 1.08E-04 | 8.10E-05 | 6.08E-05 | 4.55E-05 | 3.42E-05 | 2.57E-05 |
| 2.07E-03 | 1.55E-03 | 1.16E-03 | 8.70E-04 | 6.52E-04 | 4.89E-04 | 3.66E-04 | 2.75E-04 | 2.05E-04 | 1.54E-04 |
| 9.99E-04 | 7.44E-04 | 5.57E-04 | 4.17E-04 | 3.12E-04 | 2.33E-04 | 1.75E-04 | 1.31E-04 | 9.81E-05 | 7.33E-05 |
| 6.51E-05 | 4.84E-05 | 3.60E-05 | 2.67E-05 | 1.99E-05 | 1.49E-05 | 1.10E-05 | 8.19E-06 | 6.09E-06 | 4.54E-06 |
| 2.90E-09 | 2.12E-09 | 1.55E-09 | 1.13E-09 | 8.26E-10 | 6.04E-10 | 4.41E-10 | 3.22E-10 | 2.36E-10 | 1.72E-10 |
| 5.39E-03 | 4.05E-03 | 3.03E-03 | 2.28E-03 | 1.71E-03 | 1.28E-03 | 9.63E-04 | 7.20E-04 | 5.40E-04 | 4.05E-04 |
| 7.25E-11 | 5.23E-11 | 3.77E-11 | 2.73E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 7.46E-04 | 5.62E-04 | 4.22E-04 | 3.18E-04 | 2.39E-04 | 1.79E-04 | 1.35E-04 | 1.02E-04 | 7.62E-05 | 5.73E-05 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.21E-05 | 9.09E-06 | 6.77E-06 | 5.06E-06 | 3.79E-06 | 2.84E-06 | 2.12E-06 | 1.58E-06 | 1.19E-06 | 8.87E-07 |
| 7.44E-05 | 5.58E-05 | 4.19E-05 | 3.14E-05 | 2.36E-05 | 1.76E-05 | 1.32E-05 | 9.90E-06 | 7.45E-06 | 5.59E-06 |
| 1.33E-08 | 9.90E-09 | 7.36E-09 | 5.46E-09 | 4.06E-09 | 3.02E-09 | 2.23E-09 | 1.66E-09 | 1.23E-09 | 9.18E-10 |
| 2.02E-05 | 1.51E-05 | 1.13E-05 | 8.51E-06 | 6.37E-06 | 4.78E-06 | 3.58E-06 | 2.68E-06 | 2.01E-06 | 1.50E-06 |
| 1.76E-04 | 1.31E-04 | 9.81E-05 | 7.34E-05 | 5.48E-05 | 4.10E-05 | 3.07E-05 | 2.30E-05 | 1.71E-05 | 1.28E-05 |
| 1.02E-07 | 7.66E-08 | 5.75E-08 | 4.32E-08 | 3.25E-08 | 2.44E-08 | 1.83E-08 | 1.38E-08 | 1.04E-08 | 7.76E-09 |
| 4.90E-05 | 3.67E-05 | 2.75E-05 | 2.06E-05 | 1.55E-05 | 1.16E-05 | 8.69E-06 | 6.52E-06 | 4.89E-06 | 3.66E-06 |
| 5.90E-05 | 4.43E-05 | 3.32E-05 | 2.49E-05 | 1.86E-05 | 1.40E-05 | 1.05E-05 | 7.88E-06 | 5.90E-06 | 4.43E-06 |
| 2.33E-10 | 1.76E-10 | 1.31E-10 | 9.90E-11 | 7.43E-11 | 5.59E-11 | 4.19E-11 | 3.15E-11 | 0.00E+00 | 0.00E+00 |
| 2.12E-10 | 1.58E-10 | 1.19E-10 | 8.93E-11 | 6.70E-11 | 5.03E-11 | 3.77E-11 | 2.84E-11 | 0.00E+00 | 0.00E+00 |
| 5.60E-06 | 4.19E-06 | 3.15E-06 | 2.36E-06 | 1.77E-06 | 1.33E-06 | 9.99E-07 | 7.47E-07 | 5.60E-07 | 4.20E-07 |
| 5.77E-06 | 4.32E-06 | 3.24E-06 | 2.43E-06 | 1.82E-06 | 1.37E-06 | 1.03E-06 | 7.68E-07 | 5.75E-07 | 4.31E-07 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.13E-05 | 3.10E-05 | 2.32E-05 | 1.75E-05 | 1.31E-05 | 9.81E-06 | 7.34E-06 | 5.51E-06 | 4.13E-06 | 3.10E-06 |
| 2.23E-06 | 1.67E-06 | 1.24E-06 | 9.27E-07 | 6.94E-07 | 5.18E-07 | 3.86E-07 | 2.88E-07 | 2.15E-07 | 1.60E-07 |
| 4.14E-05 | 3.11E-05 | 2.33E-05 | 1.75E-05 | 1.31E-05 | 9.81E-06 | 7.36E-06 | 5.52E-06 | 4.14E-06 | 3.11E-06 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.26E-05 | 9.45E-06 | 7.08E-06 | 5.32E-06 | 3.99E-06 | 2.99E-06 | 2.24E-06 | 1.68E-06 | 1.26E-06 | 9.45E-07 |
| 7.32E-05 | 5.48E-05 | 4.10E-05 | 3.07E-05 | 2.30E-05 | 1.72E-05 | 1.29E-05 | 9.63E-06 | 7.22E-06 | 5.40E-06 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 7.73E-04 | 5.81E-04 | 4.35E-04 | 3.26E-04 | 2.45E-04 | 1.84E-04 | 1.38E-04 | 1.04E-04 | 7.73E-05 | 5.80E-05 |
| 6.45E-05 | 4.84E-05 | 3.63E-05 | 2.73E-05 | 2.04E-05 | 1.53E-05 | 1.15E-05 | 8.61E-06 | 6.46E-06 | 4.85E-06 |
| 4.12E-08 | 3.03E-08 | 2.23E-08 | 1.65E-08 | 1.22E-08 | 8.92E-09 | 6.57E-09 | 4.84E-09 | 3.56E-09 | 2.63E-09 |



|          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.17E-05 | 8.72E-06 | 6.53E-06 | 4.88E-06 | 3.65E-06 | 2.73E-06 | 2.04E-06 | 1.53E-06 | 1.14E-06 | 8.55E-07 |          |
| 1.14E-04 | 8.60E-05 | 6.44E-05 | 4.82E-05 | 3.61E-05 | 2.70E-05 | 2.03E-05 | 1.52E-05 | 1.13E-05 | 8.51E-06 |          |
| 3.40E-05 | 2.56E-05 | 1.92E-05 | 1.44E-05 | 1.08E-05 | 8.08E-06 | 6.06E-06 | 4.55E-06 | 3.41E-06 | 2.56E-06 |          |
| 8.49E-05 | 6.36E-05 | 4.77E-05 | 3.57E-05 | 2.68E-05 | 2.01E-05 | 1.51E-05 | 1.13E-05 | 8.48E-06 | 6.35E-06 |          |
| 1.31E-04 | 9.81E-05 | 7.33E-05 | 5.50E-05 | 4.12E-05 | 3.09E-05 | 2.31E-05 | 1.74E-05 | 1.31E-05 | 9.81E-06 |          |
| 4.26E-06 | 3.18E-06 | 2.37E-06 | 1.76E-06 | 1.31E-06 | 9.81E-07 | 7.32E-07 | 5.45E-07 | 4.07E-07 | 3.03E-07 |          |
| 1.89E-05 | 1.41E-05 | 1.05E-05 | 7.84E-06 | 5.85E-06 | 4.36E-06 | 3.25E-06 | 2.42E-06 | 1.81E-06 | 1.35E-06 |          |
| 9.63E-04 | 7.23E-04 | 5.41E-04 | 4.05E-04 | 3.02E-04 | 2.27E-04 | 1.69E-04 | 1.27E-04 | 9.54E-05 | 7.11E-05 |          |
| 6.51E-03 | 4.88E-03 | 3.65E-03 | 2.74E-03 | 2.05E-03 | 1.54E-03 | 1.15E-03 | 8.65E-04 | 6.48E-04 | 4.86E-04 |          |
| 6.41E-01 | 4.80E-01 | 3.59E-01 | 2.69E-01 | 2.02E-01 | 1.51E-01 | 1.13E-01 | 8.47E-02 | 6.35E-02 | 4.75E-02 |          |
| 6.87E-03 | 5.13E-03 | 3.83E-03 | 2.87E-03 | 2.14E-03 | 1.60E-03 | 1.20E-03 | 8.96E-04 | 6.70E-04 | 5.00E-04 |          |
| 3.96E-01 | 3.85E-01 | 3.75E-01 | 3.65E-01 | 3.56E-01 | 3.47E-01 | 3.38E-01 | 3.29E-01 | 3.20E-01 | 3.12E-01 |          |
| 6.94E-01 | 6.76E-01 | 6.58E-01 | 6.41E-01 | 6.25E-01 | 6.08E-01 | 5.92E-01 | 5.77E-01 | 5.63E-01 | 5.47E-01 |          |
| 2.84E-05 | 2.13E-05 | 1.61E-05 | 1.21E-05 | 9.09E-06 | 6.85E-06 | 5.16E-06 | 3.88E-06 | 2.92E-06 | 2.20E-06 |          |
| 4.95E-05 | 3.72E-05 | 2.79E-05 | 2.09E-05 | 1.57E-05 | 1.18E-05 | 8.81E-06 | 6.61E-06 | 4.95E-06 | 3.72E-06 |          |
| 2.61E-08 | 1.92E-08 | 1.41E-08 | 1.04E-08 | 7.67E-09 | 5.65E-09 | 4.16E-09 | 3.06E-09 | 2.26E-09 | 1.67E-09 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.02E-09 | 2.22E-09 | 1.64E-09 | 1.21E-09 | 8.90E-10 | 6.56E-10 | 4.83E-10 | 3.56E-10 | 2.63E-10 | 1.94E-10 |          |
| 6.93E-05 | 5.20E-05 | 3.90E-05 | 2.93E-05 | 2.20E-05 | 1.65E-05 | 1.23E-05 | 9.27E-06 | 6.93E-06 | 5.20E-06 |          |
| 2.34E-07 | 1.74E-07 | 1.29E-07 | 9.54E-08 | 7.11E-08 | 5.27E-08 | 3.92E-08 | 2.91E-08 | 2.16E-08 | 1.60E-08 |          |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 12:20    | 12:35    | 12:50    | 13:05    | 13:20    | 13:35    | 13:50    | 14:05    | 14:20    | 14:35    |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 6.75E-05 | 5.06E-05 | 3.79E-05 | 2.84E-05 | 2.13E-05 | 1.60E-05 | 1.20E-05 | 8.97E-06 | 6.73E-06 | 5.04E-06 |          |
| 3.71E-06 | 2.78E-06 | 2.08E-06 | 1.57E-06 | 1.17E-06 | 8.78E-07 | 6.58E-07 | 4.93E-07 | 3.70E-07 | 2.77E-07 |          |
| 1.97E-07 | 1.47E-07 | 1.10E-07 | 8.17E-08 | 6.10E-08 | 4.55E-08 | 3.39E-08 | 2.53E-08 | 1.89E-08 | 1.41E-08 |          |
| 3.32E-06 | 2.49E-06 | 1.87E-06 | 1.40E-06 | 1.05E-06 | 7.88E-07 | 5.91E-07 | 4.44E-07 | 3.32E-07 | 2.49E-07 |          |
| 1.03E-07 | 7.67E-08 | 5.75E-08 | 4.31E-08 | 3.23E-08 | 2.43E-08 | 1.82E-08 | 1.37E-08 | 1.03E-08 | 7.68E-09 |          |
| 2.76E-05 | 2.07E-05 | 1.56E-05 | 1.17E-05 | 8.75E-06 | 6.56E-06 | 4.92E-06 | 3.69E-06 | 2.77E-06 | 2.08E-06 |          |
| 8.30E-06 | 6.22E-06 | 4.66E-06 | 3.49E-06 | 2.62E-06 | 1.96E-06 | 1.48E-06 | 1.11E-06 | 8.27E-07 | 6.20E-07 |          |
| 1.93E-05 | 1.44E-05 | 1.08E-05 | 8.11E-06 | 6.08E-06 | 4.56E-06 | 3.42E-06 | 2.57E-06 | 1.93E-06 | 1.44E-06 |          |
| 1.15E-04 | 8.65E-05 | 6.48E-05 | 4.86E-05 | 3.64E-05 | 2.73E-05 | 2.04E-05 | 1.53E-05 | 1.14E-05 | 8.60E-06 |          |
| 5.48E-05 | 4.10E-05 | 3.07E-05 | 2.30E-05 | 1.72E-05 | 1.29E-05 | 9.63E-06 | 7.20E-06 | 5.39E-06 | 4.03E-06 |          |
| 3.38E-06 | 2.51E-06 | 1.86E-06 | 1.39E-06 | 1.04E-06 | 7.68E-07 | 5.71E-07 | 4.25E-07 | 3.16E-07 | 2.35E-07 |          |
| 1.26E-10 | 9.18E-11 | 6.71E-11 | 4.90E-11 | 3.58E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.04E-04 | 2.28E-04 | 1.71E-04 | 1.28E-04 | 9.63E-05 | 7.21E-05 | 5.41E-05 | 4.06E-05 | 3.04E-05 | 2.28E-05 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.31E-05 | 3.24E-05 | 2.44E-05 | 1.84E-05 | 1.38E-05 | 1.04E-05 | 7.79E-06 | 5.85E-06 | 4.40E-06 | 3.30E-06 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 6.63E-07 | 4.96E-07 | 3.71E-07 | 2.78E-07 | 2.08E-07 | 1.56E-07 | 1.16E-07 | 8.69E-08 | 6.51E-08 | 4.87E-08 |          |
| 4.19E-06 | 3.14E-06 | 2.36E-06 | 1.76E-06 | 1.32E-06 | 9.99E-07 | 7.46E-07 | 5.60E-07 | 4.19E-07 | 3.15E-07 |          |
| 6.79E-10 | 5.04E-10 | 3.74E-10 | 2.78E-10 | 2.06E-10 | 1.53E-10 | 1.13E-10 | 8.43E-11 | 6.26E-11 | 4.64E-11 |          |
| 1.13E-06 | 8.47E-07 | 6.35E-07 | 4.76E-07 | 3.56E-07 | 2.67E-07 | 2.01E-07 | 1.50E-07 | 1.13E-07 | 8.43E-08 |          |
| 9.54E-06 | 7.16E-06 | 5.36E-06 | 4.01E-06 | 3.00E-06 | 2.24E-06 | 1.67E-06 | 1.25E-06 | 9.36E-07 | 7.00E-07 |          |
| 5.82E-09 | 4.37E-09 | 3.29E-09 | 2.47E-09 | 1.85E-09 | 1.40E-09 | 1.04E-09 | 7.86E-10 | 5.90E-10 | 4.43E-10 |          |
| 2.75E-06 | 2.06E-06 | 1.54E-06 | 1.15E-06 | 8.67E-07 | 6.50E-07 | 4.87E-07 | 3.65E-07 | 2.74E-07 | 2.05E-07 |          |
| 3.32E-06 | 2.49E-06 | 1.87E-06 | 1.40E-06 | 1.05E-06 | 7.88E-07 | 5.91E-07 | 4.44E-07 | 3.32E-07 | 2.49E-07 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.15E-07 | 2.37E-07 | 1.77E-07 | 1.33E-07 | 9.99E-08 | 7.48E-08 | 5.61E-08 | 4.20E-08 | 3.15E-08 | 2.37E-08 |          |
| 3.23E-07 | 2.42E-07 | 1.82E-07 | 1.36E-07 | 1.03E-07 | 7.66E-08 | 5.74E-08 | 4.30E-08 | 3.23E-08 | 2.42E-08 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.32E-06 | 1.75E-06 | 1.31E-06 | 9.81E-07 | 7.34E-07 | 5.51E-07 | 4.13E-07 | 3.10E-07 | 2.32E-07 | 1.74E-07 |          |
| 1.20E-07 | 8.95E-08 | 6.68E-08 | 4.99E-08 | 3.72E-08 | 2.77E-08 | 2.07E-08 | 1.55E-08 | 1.15E-08 | 8.61E-09 |          |
| 2.33E-06 | 1.75E-06 | 1.31E-06 | 9.81E-07 | 7.36E-07 | 5.52E-07 | 4.14E-07 | 3.11E-07 | 2.33E-07 | 1.75E-07 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 7.09E-07 | 5.32E-07 | 3.99E-07 | 2.99E-07 | 2.24E-07 | 1.68E-07 | 1.26E-07 | 9.45E-08 | 7.10E-08 | 5.33E-08 |          |
| 4.04E-06 | 3.02E-06 | 2.27E-06 | 1.69E-06 | 1.27E-06 | 9.54E-07 | 7.12E-07 | 5.33E-07 | 3.99E-07 | 2.99E-07 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.35E-05 | 3.26E-05 | 2.45E-05 | 1.84E-05 | 1.38E-05 | 1.04E-05 | 7.73E-06 | 5.80E-06 | 4.35E-06 | 3.26E-06 |          |
| 3.64E-06 | 2.73E-06 | 2.04E-06 | 1.53E-06 | 1.15E-06 | 8.63E-07 | 6.47E-07 | 4.85E-07 | 3.64E-07 | 2.73E-07 |          |
| 1.94E-09 | 1.42E-09 | 1.04E-09 | 7.72E-10 | 5.69E-10 | 4.19E-10 | 3.09E-10 | 2.27E-10 | 1.67E-10 | 1.23E-10 |          |

|          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 6.40E-07 | 4.79E-07 | 3.58E-07 | 2.67E-07 | 2.00E-07 | 1.49E-07 | 1.12E-07 | 8.38E-08 | 6.27E-08 | 4.69E-08 |          |
| 6.37E-06 | 4.77E-06 | 3.57E-06 | 2.68E-06 | 2.01E-06 | 1.50E-06 | 1.13E-06 | 8.43E-07 | 6.31E-07 | 4.73E-07 |          |
| 1.92E-06 | 1.44E-06 | 1.08E-06 | 8.09E-07 | 6.07E-07 | 4.55E-07 | 3.41E-07 | 2.56E-07 | 1.92E-07 | 1.44E-07 |          |
| 4.77E-06 | 3.57E-06 | 2.68E-06 | 2.01E-06 | 1.50E-06 | 1.13E-06 | 8.48E-07 | 6.35E-07 | 4.76E-07 | 3.57E-07 |          |
| 7.33E-06 | 5.49E-06 | 4.12E-06 | 3.09E-06 | 2.31E-06 | 1.74E-06 | 1.31E-06 | 9.72E-07 | 7.32E-07 | 5.49E-07 |          |
| 2.26E-07 | 1.68E-07 | 1.26E-07 | 9.36E-08 | 6.99E-08 | 5.22E-08 | 3.89E-08 | 2.90E-08 | 2.16E-08 | 1.61E-08 |          |
| 1.01E-06 | 7.50E-07 | 5.59E-07 | 4.17E-07 | 3.11E-07 | 2.31E-07 | 1.73E-07 | 1.29E-07 | 9.63E-08 | 7.16E-08 |          |
| 5.32E-05 | 3.98E-05 | 2.98E-05 | 2.23E-05 | 1.67E-05 | 1.25E-05 | 9.36E-06 | 6.99E-06 | 5.23E-06 | 3.92E-06 |          |
| 3.65E-04 | 2.73E-04 | 2.04E-04 | 1.53E-04 | 1.15E-04 | 8.61E-05 | 6.46E-05 | 4.84E-05 | 3.63E-05 | 2.72E-05 |          |
| 3.56E-02 | 2.66E-02 | 2.00E-02 | 1.49E-02 | 1.12E-02 | 8.39E-03 | 6.28E-03 | 4.71E-03 | 3.53E-03 | 2.64E-03 |          |
| 3.74E-04 | 2.80E-04 | 2.09E-04 | 1.57E-04 | 1.17E-04 | 8.73E-05 | 6.53E-05 | 4.88E-05 | 3.65E-05 | 2.73E-05 |          |
| 3.04E-01 | 2.96E-01 | 2.89E-01 | 2.81E-01 | 2.74E-01 | 2.66E-01 | 2.60E-01 | 2.53E-01 | 2.47E-01 | 2.40E-01 |          |
| 5.34E-01 | 5.19E-01 | 5.06E-01 | 4.93E-01 | 4.81E-01 | 4.68E-01 | 4.55E-01 | 4.44E-01 | 4.32E-01 | 4.21E-01 |          |
| 1.66E-06 | 1.24E-06 | 9.36E-07 | 7.05E-07 | 5.30E-07 | 3.99E-07 | 3.00E-07 | 2.26E-07 | 1.70E-07 | 1.28E-07 |          |
| 2.79E-06 | 2.09E-06 | 1.57E-06 | 1.18E-06 | 8.81E-07 | 6.61E-07 | 4.96E-07 | 3.72E-07 | 2.79E-07 | 2.09E-07 |          |
| 1.22E-09 | 9.00E-10 | 6.63E-10 | 4.89E-10 | 3.60E-10 | 2.66E-10 | 1.95E-10 | 1.44E-10 | 1.06E-10 | 7.79E-11 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.43E-10 | 1.05E-10 | 7.77E-11 | 5.72E-11 | 4.22E-11 | 3.11E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.90E-06 | 2.93E-06 | 2.20E-06 | 1.65E-06 | 1.23E-06 | 9.27E-07 | 6.94E-07 | 5.20E-07 | 3.90E-07 | 2.93E-07 |          |
| 1.19E-08 | 8.83E-09 | 6.55E-09 | 4.87E-09 | 3.61E-09 | 2.68E-09 | 1.99E-09 | 1.48E-09 | 1.10E-09 | 8.15E-10 |          |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 14:50    | 15:05    | 15:20    | 15:35    | 15:50    | 16:05    | 16:20    | 16:35    | 16:50    | 17:05    |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.78E-06 | 2.84E-06 | 2.12E-06 | 1.59E-06 | 1.20E-06 | 8.95E-07 | 6.71E-07 | 5.02E-07 | 3.77E-07 | 2.83E-07 |          |
| 2.08E-07 | 1.56E-07 | 1.17E-07 | 8.78E-08 | 6.58E-08 | 4.93E-08 | 3.70E-08 | 2.77E-08 | 2.08E-08 | 1.56E-08 |          |
| 1.05E-08 | 7.85E-09 | 5.85E-09 | 4.37E-09 | 3.26E-09 | 2.43E-09 | 1.82E-09 | 1.35E-09 | 1.01E-09 | 7.53E-10 |          |
| 1.87E-07 | 1.40E-07 | 1.05E-07 | 7.89E-08 | 5.91E-08 | 4.44E-08 | 3.33E-08 | 2.49E-08 | 1.87E-08 | 1.40E-08 |          |
| 5.76E-09 | 4.32E-09 | 3.24E-09 | 2.43E-09 | 1.82E-09 | 1.37E-09 | 1.03E-09 | 7.68E-10 | 5.76E-10 | 4.32E-10 |          |
| 1.56E-06 | 1.17E-06 | 8.76E-07 | 6.57E-07 | 4.92E-07 | 3.70E-07 | 2.77E-07 | 2.08E-07 | 1.56E-07 | 1.17E-07 |          |
| 4.64E-07 | 3.48E-07 | 2.61E-07 | 1.95E-07 | 1.47E-07 | 1.10E-07 | 8.24E-08 | 6.18E-08 | 4.64E-08 | 3.47E-08 |          |
| 1.08E-06 | 8.12E-07 | 6.08E-07 | 4.56E-07 | 3.43E-07 | 2.57E-07 | 1.93E-07 | 1.45E-07 | 1.08E-07 | 8.13E-08 |          |
| 6.44E-06 | 4.82E-06 | 3.62E-06 | 2.71E-06 | 2.03E-06 | 1.52E-06 | 1.14E-06 | 8.54E-07 | 6.40E-07 | 4.80E-07 |          |
| 3.02E-06 | 2.26E-06 | 1.69E-06 | 1.27E-06 | 9.45E-07 | 7.08E-07 | 5.30E-07 | 3.97E-07 | 2.97E-07 | 2.22E-07 |          |
| 1.75E-07 | 1.30E-07 | 9.63E-08 | 7.19E-08 | 5.35E-08 | 3.98E-08 | 2.96E-08 | 2.20E-08 | 1.64E-08 | 1.22E-08 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.71E-05 | 1.29E-05 | 9.63E-06 | 7.22E-06 | 5.41E-06 | 4.06E-06 | 3.04E-06 | 2.29E-06 | 1.71E-06 | 1.29E-06 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.48E-06 | 1.87E-06 | 1.40E-06 | 1.05E-06 | 7.93E-07 | 5.96E-07 | 4.48E-07 | 3.37E-07 | 2.53E-07 | 1.90E-07 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.64E-08 | 2.72E-08 | 2.03E-08 | 1.52E-08 | 1.14E-08 | 8.52E-09 | 6.37E-09 | 4.77E-09 | 3.56E-09 | 2.67E-09 |          |
| 2.36E-07 | 1.77E-07 | 1.33E-07 | 9.99E-08 | 7.47E-08 | 5.60E-08 | 4.20E-08 | 3.15E-08 | 2.37E-08 | 1.77E-08 |          |
| 3.45E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 6.32E-08 | 4.73E-08 | 3.55E-08 | 2.66E-08 | 2.00E-08 | 1.49E-08 | 1.12E-08 | 8.40E-09 | 6.29E-09 | 4.72E-09 |          |
| 5.23E-07 | 3.92E-07 | 2.93E-07 | 2.19E-07 | 1.64E-07 | 1.22E-07 | 9.18E-08 | 6.84E-08 | 5.11E-08 | 3.83E-08 |          |
| 3.33E-10 | 2.50E-10 | 1.88E-10 | 1.41E-10 | 1.06E-10 | 7.96E-11 | 5.98E-11 | 4.49E-11 | 3.37E-11 | 0.00E+00 |          |
| 1.54E-07 | 1.15E-07 | 8.64E-08 | 6.48E-08 | 4.85E-08 | 3.64E-08 | 2.73E-08 | 2.04E-08 | 1.53E-08 | 1.15E-08 |          |
| 1.87E-07 | 1.40E-07 | 1.05E-07 | 7.89E-08 | 5.91E-08 | 4.44E-08 | 3.33E-08 | 2.49E-08 | 1.87E-08 | 1.40E-08 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.77E-08 | 1.33E-08 | 9.99E-09 | 7.49E-09 | 5.62E-09 | 4.21E-09 | 3.16E-09 | 2.37E-09 | 1.77E-09 | 1.33E-09 |          |
| 1.82E-08 | 1.36E-08 | 1.02E-08 | 7.65E-09 | 5.73E-09 | 4.30E-09 | 3.22E-09 | 2.41E-09 | 1.81E-09 | 1.36E-09 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.31E-07 | 9.81E-08 | 7.34E-08 | 5.51E-08 | 4.13E-08 | 3.10E-08 | 2.32E-08 | 1.74E-08 | 1.31E-08 | 9.81E-09 |          |
| 6.43E-09 | 4.80E-09 | 3.58E-09 | 2.67E-09 | 2.00E-09 | 1.49E-09 | 1.11E-09 | 8.29E-10 | 6.18E-10 | 4.62E-10 |          |
| 1.31E-07 | 9.81E-08 | 7.35E-08 | 5.52E-08 | 4.14E-08 | 3.11E-08 | 2.32E-08 | 1.75E-08 | 1.31E-08 | 9.81E-09 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.00E-08 | 3.00E-08 | 2.25E-08 | 1.68E-08 | 1.26E-08 | 9.45E-09 | 7.11E-09 | 5.33E-09 | 4.00E-09 | 3.00E-09 |          |
| 2.23E-07 | 1.67E-07 | 1.25E-07 | 9.36E-08 | 7.02E-08 | 5.26E-08 | 3.93E-08 | 2.94E-08 | 2.21E-08 | 1.65E-08 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.45E-06 | 1.84E-06 | 1.38E-06 | 1.04E-06 | 7.73E-07 | 5.80E-07 | 4.35E-07 | 3.26E-07 | 2.45E-07 | 1.84E-07 |          |
| 2.04E-07 | 1.54E-07 | 1.15E-07 | 8.64E-08 | 6.48E-08 | 4.86E-08 | 3.65E-08 | 2.74E-08 | 2.05E-08 | 1.54E-08 |          |
| 9.09E-11 | 6.68E-11 | 4.92E-11 | 3.63E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

|          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.51E-08 | 2.63E-08 | 1.96E-08 | 1.47E-08 | 1.10E-08 | 8.22E-09 | 6.15E-09 | 4.60E-09 | 3.44E-09 | 2.57E-09 |          |
| 3.55E-07 | 2.66E-07 | 1.99E-07 | 1.49E-07 | 1.12E-07 | 8.35E-08 | 6.26E-08 | 4.68E-08 | 3.51E-08 | 2.63E-08 |          |
| 1.08E-07 | 8.09E-08 | 6.08E-08 | 4.55E-08 | 3.41E-08 | 2.57E-08 | 1.92E-08 | 1.44E-08 | 1.08E-08 | 8.10E-09 |          |
| 2.68E-07 | 2.01E-07 | 1.50E-07 | 1.13E-07 | 8.47E-08 | 6.35E-08 | 4.76E-08 | 3.57E-08 | 2.67E-08 | 2.01E-08 |          |
| 4.11E-07 | 3.09E-07 | 2.31E-07 | 1.74E-07 | 1.31E-07 | 9.72E-08 | 7.32E-08 | 5.48E-08 | 4.11E-08 | 3.09E-08 |          |
| 1.21E-08 | 8.97E-09 | 6.69E-09 | 4.99E-09 | 3.72E-09 | 2.77E-09 | 2.07E-09 | 1.54E-09 | 1.15E-09 | 8.58E-10 |          |
| 5.35E-08 | 3.99E-08 | 2.97E-08 | 2.21E-08 | 1.66E-08 | 1.23E-08 | 9.18E-09 | 6.85E-09 | 5.10E-09 | 3.81E-09 |          |
| 2.93E-06 | 2.20E-06 | 1.64E-06 | 1.22E-06 | 9.18E-07 | 6.88E-07 | 5.15E-07 | 3.85E-07 | 2.88E-07 | 2.16E-07 |          |
| 2.03E-05 | 1.53E-05 | 1.14E-05 | 8.59E-06 | 6.44E-06 | 4.82E-06 | 3.62E-06 | 2.71E-06 | 2.03E-06 | 1.52E-06 |          |
| 1.98E-03 | 1.49E-03 | 1.11E-03 | 8.31E-04 | 6.22E-04 | 4.66E-04 | 3.49E-04 | 2.61E-04 | 1.96E-04 | 1.47E-04 |          |
| 2.03E-05 | 1.52E-05 | 1.14E-05 | 8.51E-06 | 6.36E-06 | 4.76E-06 | 3.56E-06 | 2.66E-06 | 1.99E-06 | 1.49E-06 |          |
| 2.34E-01 | 2.28E-01 | 2.22E-01 | 2.16E-01 | 2.11E-01 | 2.05E-01 | 2.00E-01 | 1.94E-01 | 1.90E-01 | 1.85E-01 |          |
| 4.10E-01 | 4.00E-01 | 3.89E-01 | 3.79E-01 | 3.69E-01 | 3.60E-01 | 3.50E-01 | 3.41E-01 | 3.32E-01 | 3.24E-01 |          |
| 9.63E-08 | 7.23E-08 | 5.44E-08 | 4.10E-08 | 3.08E-08 | 2.31E-08 | 1.74E-08 | 1.31E-08 | 9.81E-09 | 7.41E-09 |          |
| 1.57E-07 | 1.18E-07 | 8.81E-08 | 6.61E-08 | 4.96E-08 | 3.72E-08 | 2.79E-08 | 2.09E-08 | 1.57E-08 | 1.18E-08 |          |
| 5.74E-11 | 4.23E-11 | 3.11E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.20E-07 | 1.65E-07 | 1.23E-07 | 9.27E-08 | 6.94E-08 | 5.20E-08 | 3.90E-08 | 2.93E-08 | 2.20E-08 | 1.65E-08 |          |
| 6.05E-10 | 4.49E-10 | 3.33E-10 | 2.48E-10 | 1.84E-10 | 1.36E-10 | 1.01E-10 | 7.52E-11 | 5.58E-11 | 4.14E-11 |          |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|
| 17:20    | 17:35    | 17:50    | 18:05    | 18:20    | 18:35    | 18:50    |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.12E-07 | 1.58E-07 | 1.19E-07 | 8.92E-08 | 6.68E-08 | 5.01E-08 | 3.75E-08 |
| 1.17E-08 | 8.77E-09 | 6.58E-09 | 4.93E-09 | 3.70E-09 | 2.77E-09 | 2.08E-09 |
| 5.63E-10 | 4.19E-10 | 3.13E-10 | 2.33E-10 | 1.75E-10 | 1.30E-10 | 9.72E-11 |
| 1.05E-08 | 7.89E-09 | 5.92E-09 | 4.45E-09 | 3.33E-09 | 2.50E-09 | 1.87E-09 |
| 3.24E-10 | 2.43E-10 | 1.82E-10 | 1.37E-10 | 1.03E-10 | 7.69E-11 | 5.77E-11 |
| 8.77E-08 | 6.58E-08 | 4.93E-08 | 3.70E-08 | 2.77E-08 | 2.08E-08 | 1.56E-08 |
| 2.60E-08 | 1.95E-08 | 1.46E-08 | 1.10E-08 | 8.22E-09 | 6.16E-09 | 4.62E-09 |
| 6.09E-08 | 4.57E-08 | 3.43E-08 | 2.57E-08 | 1.93E-08 | 1.45E-08 | 1.09E-08 |
| 3.59E-07 | 2.69E-07 | 2.02E-07 | 1.51E-07 | 1.13E-07 | 8.50E-08 | 6.36E-08 |
| 1.67E-07 | 1.24E-07 | 9.27E-08 | 6.97E-08 | 5.21E-08 | 3.90E-08 | 2.92E-08 |
| 9.09E-09 | 6.73E-09 | 5.00E-09 | 3.73E-09 | 2.77E-09 | 2.06E-09 | 1.53E-09 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 9.63E-07 | 7.23E-07 | 5.42E-07 | 4.07E-07 | 3.05E-07 | 2.29E-07 | 1.71E-07 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.43E-07 | 1.07E-07 | 8.07E-08 | 6.07E-08 | 4.56E-08 | 3.43E-08 | 2.57E-08 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.00E-09 | 1.49E-09 | 1.12E-09 | 8.35E-10 | 6.25E-10 | 4.67E-10 | 3.50E-10 |
| 1.33E-08 | 9.99E-09 | 7.48E-09 | 5.61E-09 | 4.20E-09 | 3.15E-09 | 2.37E-09 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.54E-09 | 2.65E-09 | 1.99E-09 | 1.49E-09 | 1.12E-09 | 8.36E-10 | 6.26E-10 |
| 2.86E-08 | 2.13E-08 | 1.60E-08 | 1.20E-08 | 8.93E-09 | 6.68E-09 | 5.00E-09 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 8.61E-09 | 6.45E-09 | 4.84E-09 | 3.63E-09 | 2.72E-09 | 2.03E-09 | 1.53E-09 |
| 1.05E-08 | 7.89E-09 | 5.92E-09 | 4.45E-09 | 3.33E-09 | 2.50E-09 | 1.87E-09 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 9.99E-10 | 7.50E-10 | 5.62E-10 | 4.21E-10 | 3.16E-10 | 2.37E-10 | 1.78E-10 |
| 1.02E-09 | 7.63E-10 | 5.72E-10 | 4.29E-10 | 3.21E-10 | 2.41E-10 | 1.81E-10 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 7.34E-09 | 5.51E-09 | 4.13E-09 | 3.10E-09 | 2.32E-09 | 1.74E-09 | 1.31E-09 |
| 3.45E-10 | 2.57E-10 | 1.92E-10 | 1.43E-10 | 1.07E-10 | 7.97E-11 | 5.96E-11 |
| 7.35E-09 | 5.52E-09 | 4.14E-09 | 3.11E-09 | 2.32E-09 | 1.75E-09 | 1.31E-09 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.25E-09 | 1.68E-09 | 1.27E-09 | 9.45E-10 | 7.11E-10 | 5.34E-10 | 4.01E-10 |
| 1.23E-08 | 9.27E-09 | 6.92E-09 | 5.18E-09 | 3.88E-09 | 2.91E-09 | 2.17E-09 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.38E-07 | 1.04E-07 | 7.73E-08 | 5.80E-08 | 4.35E-08 | 3.26E-08 | 2.45E-08 |
| 1.15E-08 | 8.65E-09 | 6.49E-09 | 4.86E-09 | 3.65E-09 | 2.74E-09 | 2.05E-09 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

|          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.93E-09 | 1.44E-09 | 1.08E-09 | 8.06E-10 | 6.02E-10 | 4.51E-10 | 3.38E-10 |
| 1.97E-08 | 1.48E-08 | 1.11E-08 | 8.27E-09 | 6.19E-09 | 4.64E-09 | 3.47E-09 |
| 6.08E-09 | 4.55E-09 | 3.42E-09 | 2.57E-09 | 1.93E-09 | 1.44E-09 | 1.08E-09 |
| 1.50E-08 | 1.13E-08 | 8.46E-09 | 6.35E-09 | 4.76E-09 | 3.56E-09 | 2.67E-09 |
| 2.31E-08 | 1.74E-08 | 1.30E-08 | 9.72E-09 | 7.31E-09 | 5.48E-09 | 4.11E-09 |
| 6.39E-10 | 4.77E-10 | 3.56E-10 | 2.66E-10 | 1.98E-10 | 1.48E-10 | 1.10E-10 |
| 2.84E-09 | 2.12E-09 | 1.58E-09 | 1.18E-09 | 8.78E-10 | 6.54E-10 | 4.88E-10 |
| 1.61E-07 | 1.21E-07 | 9.00E-08 | 6.76E-08 | 5.06E-08 | 3.79E-08 | 2.84E-08 |
| 1.14E-06 | 8.55E-07 | 6.41E-07 | 4.81E-07 | 3.60E-07 | 2.70E-07 | 2.03E-07 |
| 1.10E-04 | 8.23E-05 | 6.17E-05 | 4.62E-05 | 3.46E-05 | 2.59E-05 | 1.94E-05 |
| 1.11E-06 | 8.30E-07 | 6.21E-07 | 4.64E-07 | 3.47E-07 | 2.59E-07 | 1.94E-07 |
| 1.80E-01 | 1.76E-01 | 1.71E-01 | 1.67E-01 | 1.62E-01 | 1.58E-01 | 1.54E-01 |
| 3.16E-01 | 3.07E-01 | 3.00E-01 | 2.92E-01 | 2.84E-01 | 2.76E-01 | 2.69E-01 |
| 5.57E-09 | 4.19E-09 | 3.15E-09 | 2.38E-09 | 1.78E-09 | 1.34E-09 | 1.01E-09 |
| 8.81E-09 | 6.61E-09 | 4.96E-09 | 3.72E-09 | 2.79E-09 | 2.09E-09 | 1.57E-09 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.23E-08 | 9.27E-09 | 6.94E-09 | 5.20E-09 | 3.91E-09 | 2.93E-09 | 2.20E-09 |
| 3.07E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

RASCAL v4.1.0 Source Term

File created: 2011/03/16 11:23

Case name 33% core melt with met 16MAR 0945 met data

Radionuclide units: Ci

| Interval | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Start    | 19:05    | 19:20    | 19:35    | 19:50    | 20:05    | 20:20    | 20:35    | 20:50    | 21:05    |
| Am-241   | 7.79E-06 | 5.87E-06 | 4.42E-06 | 3.32E-06 | 2.50E-06 | 1.88E-06 | 1.41E-06 | 1.06E-06 | 8.03E-07 |
| Ba-140   | 2.58E+02 | 1.94E+02 | 1.45E+02 | 1.09E+02 | 8.15E+01 | 6.11E+01 | 4.58E+01 | 3.44E+01 | 2.57E+01 |
| Ce-141   | 7.11E+00 | 5.33E+00 | 4.00E+00 | 3.00E+00 | 2.25E+00 | 1.68E+00 | 1.26E+00 | 9.45E-01 | 7.11E-01 |
| Ce-143   | 5.34E-01 | 3.99E-01 | 2.97E-01 | 2.21E-01 | 1.66E-01 | 1.23E-01 | 9.18E-02 | 6.87E-02 | 5.12E-02 |
| Ce-144   | 6.29E+00 | 4.72E+00 | 3.54E+00 | 2.66E+00 | 1.99E+00 | 1.49E+00 | 1.12E+00 | 8.40E-01 | 6.30E-01 |
| Cm-242   | 7.88E-02 | 5.91E-02 | 4.44E-02 | 3.33E-02 | 2.49E-02 | 1.87E-02 | 1.40E-02 | 1.05E-02 | 7.89E-03 |
| Cs-134   | 3.70E+02 | 2.77E+02 | 2.08E+02 | 1.56E+02 | 1.17E+02 | 8.78E+01 | 6.58E+01 | 4.93E+01 | 3.70E+01 |
| Cs-136   | 1.15E+02 | 8.63E+01 | 6.47E+01 | 4.85E+01 | 3.64E+01 | 2.73E+01 | 2.04E+01 | 1.53E+01 | 1.15E+01 |
| Cs-137   | 2.57E+02 | 1.93E+02 | 1.44E+02 | 1.08E+02 | 8.13E+01 | 6.09E+01 | 4.57E+01 | 3.43E+01 | 2.57E+01 |
| I-131    | 2.11E+03 | 1.58E+03 | 1.18E+03 | 8.87E+02 | 6.64E+02 | 4.98E+02 | 3.74E+02 | 2.80E+02 | 2.10E+02 |
| I-132    | 2.35E+02 | 1.76E+02 | 1.31E+02 | 9.81E+01 | 7.37E+01 | 5.52E+01 | 4.12E+01 | 3.09E+01 | 2.31E+01 |
| I-133    | 1.04E+02 | 7.67E+01 | 5.71E+01 | 4.24E+01 | 3.16E+01 | 2.35E+01 | 1.75E+01 | 1.30E+01 | 9.63E+00 |
| I-135    | 1.32E-02 | 9.72E-03 | 7.07E-03 | 5.17E-03 | 3.77E-03 | 2.75E-03 | 2.02E-03 | 1.47E-03 | 1.07E-03 |
| Kr-85    | 4.65E+04 | 3.49E+04 | 2.62E+04 | 1.96E+04 | 1.48E+04 | 1.11E+04 | 8.28E+03 | 6.21E+03 | 4.65E+03 |
| Kr-85m   | 6.09E-03 | 4.40E-03 | 3.18E-03 | 2.30E-03 | 1.66E-03 | 1.20E-03 | 8.60E-04 | 6.21E-04 | 4.48E-04 |
| Kr-88    | 2.23E-07 | 1.58E-07 | 1.12E-07 | 7.85E-08 | 5.54E-08 | 3.91E-08 | 2.75E-08 | 1.94E-08 | 1.37E-08 |
| La-140   | 1.27E+02 | 9.54E+01 | 7.18E+01 | 5.41E+01 | 4.08E+01 | 3.07E+01 | 2.31E+01 | 1.74E+01 | 1.31E+01 |
| La-141   | 9.72E-10 | 6.95E-10 | 4.99E-10 | 3.58E-10 | 2.57E-10 | 1.85E-10 | 1.32E-10 | 9.54E-11 | 6.81E-11 |
| Mo-99    | 1.21E+01 | 8.99E+00 | 6.73E+00 | 5.03E+00 | 3.76E+00 | 2.82E+00 | 2.11E+00 | 1.58E+00 | 1.18E+00 |
| Nb-95    | 3.23E+00 | 2.42E+00 | 1.82E+00 | 1.36E+00 | 1.02E+00 | 7.66E-01 | 5.74E-01 | 4.31E-01 | 3.23E-01 |
| Nb-97    | 1.06E-03 | 7.87E-04 | 5.84E-04 | 4.34E-04 | 3.21E-04 | 2.39E-04 | 1.77E-04 | 1.31E-04 | 9.81E-05 |
| Nd-147   | 9.09E-01 | 6.81E-01 | 5.10E-01 | 3.83E-01 | 2.87E-01 | 2.15E-01 | 1.61E-01 | 1.21E-01 | 9.09E-02 |
| Np-239   | 2.24E+01 | 1.67E+01 | 1.25E+01 | 9.36E+00 | 6.99E+00 | 5.23E+00 | 3.91E+00 | 2.93E+00 | 2.19E+00 |
| Pm-147   | 4.02E-03 | 3.02E-03 | 2.27E-03 | 1.70E-03 | 1.28E-03 | 9.63E-04 | 7.23E-04 | 5.43E-04 | 4.08E-04 |
| Pr-143   | 2.19E+00 | 1.64E+00 | 1.23E+00 | 9.18E-01 | 6.91E-01 | 5.18E-01 | 3.89E-01 | 2.92E-01 | 2.19E-01 |
| Pr-144   | 6.29E+00 | 4.72E+00 | 3.54E+00 | 2.66E+00 | 1.99E+00 | 1.49E+00 | 1.12E+00 | 8.40E-01 | 6.30E-01 |
| Pu-238   | 1.85E-05 | 1.39E-05 | 1.04E-05 | 7.81E-06 | 5.87E-06 | 4.40E-06 | 3.30E-06 | 2.48E-06 | 1.86E-06 |
| Pu-239   | 2.15E-05 | 1.61E-05 | 1.22E-05 | 9.09E-06 | 6.82E-06 | 5.12E-06 | 3.84E-06 | 2.89E-06 | 2.17E-06 |
| Pu-241   | 5.96E-01 | 4.46E-01 | 3.35E-01 | 2.51E-01 | 1.88E-01 | 1.41E-01 | 1.06E-01 | 7.96E-02 | 5.97E-02 |
| Rb-86    | 4.44E+00 | 3.33E+00 | 2.49E+00 | 1.87E+00 | 1.40E+00 | 1.05E+00 | 7.88E-01 | 5.90E-01 | 4.43E-01 |
| Rb-88    | 2.50E-07 | 1.76E-07 | 1.24E-07 | 8.78E-08 | 6.19E-08 | 4.37E-08 | 3.08E-08 | 2.17E-08 | 1.53E-08 |
| Rh-103m  | 3.56E+01 | 2.66E+01 | 2.00E+01 | 1.50E+01 | 1.13E+01 | 8.43E+00 | 6.33E+00 | 4.74E+00 | 3.56E+00 |
| Rh-105   | 2.55E+00 | 1.90E+00 | 1.41E+00 | 1.05E+00 | 7.89E-01 | 5.89E-01 | 4.39E-01 | 3.28E-01 | 2.45E-01 |
| Ru-103   | 3.56E+01 | 2.67E+01 | 2.01E+01 | 1.50E+01 | 1.13E+01 | 8.45E+00 | 6.34E+00 | 4.75E+00 | 3.56E+00 |
| Ru-105   | 1.03E-07 | 7.41E-08 | 5.34E-08 | 3.85E-08 | 2.78E-08 | 2.01E-08 | 1.45E-08 | 1.04E-08 | 7.52E-09 |
| Ru-106   | 1.07E+01 | 8.06E+00 | 6.04E+00 | 4.53E+00 | 3.40E+00 | 2.55E+00 | 1.91E+00 | 1.43E+00 | 1.07E+00 |
| Sb-127   | 1.69E+01 | 1.27E+01 | 9.45E+00 | 7.10E+00 | 5.32E+00 | 3.98E+00 | 2.98E+00 | 2.23E+00 | 1.67E+00 |
| Sb-129   | 3.39E-07 | 2.45E-07 | 1.76E-07 | 1.27E-07 | 9.18E-08 | 6.60E-08 | 4.75E-08 | 3.42E-08 | 2.47E-08 |
| Sr-89    | 1.62E+02 | 1.22E+02 | 9.09E+01 | 6.81E+01 | 5.11E+01 | 3.83E+01 | 2.87E+01 | 2.15E+01 | 1.62E+01 |
| Sr-90    | 1.34E+01 | 9.99E+00 | 7.52E+00 | 5.64E+00 | 4.23E+00 | 3.18E+00 | 2.38E+00 | 1.78E+00 | 1.34E+00 |
| Sr-91    | 2.50E-02 | 1.85E-02 | 1.36E-02 | 9.99E-03 | 7.36E-03 | 5.42E-03 | 3.99E-03 | 2.94E-03 | 2.17E-03 |



|         |          |          |          |          |          |          |          |          |          |
|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Tc-99m  | 1.16E+01 | 8.67E+00 | 6.49E+00 | 4.85E+00 | 3.63E+00 | 2.72E+00 | 2.03E+00 | 1.52E+00 | 1.13E+00 |
| Te-127  | 2.57E+01 | 1.93E+01 | 1.44E+01 | 1.08E+01 | 8.10E+00 | 6.07E+00 | 4.55E+00 | 3.40E+00 | 2.55E+00 |
| Te-127m | 7.07E+00 | 5.30E+00 | 3.98E+00 | 2.99E+00 | 2.24E+00 | 1.67E+00 | 1.26E+00 | 9.45E-01 | 7.08E-01 |
| Te-129  | 1.78E+01 | 1.33E+01 | 9.99E+00 | 7.51E+00 | 5.63E+00 | 4.22E+00 | 3.17E+00 | 2.38E+00 | 1.78E+00 |
| Te-129m | 2.74E+01 | 2.05E+01 | 1.54E+01 | 1.15E+01 | 8.65E+00 | 6.48E+00 | 4.86E+00 | 3.65E+00 | 2.74E+00 |
| Te-131  | 1.24E+00 | 9.27E-01 | 6.89E-01 | 5.14E-01 | 3.83E-01 | 2.86E-01 | 2.13E-01 | 1.59E-01 | 1.19E-01 |
| Te-131m | 5.51E+00 | 4.10E+00 | 3.06E+00 | 2.29E+00 | 1.70E+00 | 1.27E+00 | 9.45E-01 | 7.07E-01 | 5.27E-01 |
| Te-132  | 2.28E+02 | 1.71E+02 | 1.28E+02 | 9.54E+01 | 7.15E+01 | 5.35E+01 | 4.01E+01 | 3.00E+01 | 2.24E+01 |
| Xe-131m | 5.81E+04 | 4.36E+04 | 3.27E+04 | 2.45E+04 | 1.84E+04 | 1.38E+04 | 1.04E+04 | 7.73E+03 | 5.80E+03 |
| Xe-133  | 5.99E+06 | 4.48E+06 | 3.36E+06 | 2.51E+06 | 1.88E+06 | 1.41E+06 | 1.05E+06 | 7.91E+05 | 5.93E+05 |
| Xe-133m | 7.19E+04 | 5.37E+04 | 4.01E+04 | 3.01E+04 | 2.25E+04 | 1.68E+04 | 1.25E+04 | 9.36E+03 | 7.01E+03 |
| Xe-135  | 2.01E+03 | 1.48E+03 | 1.09E+03 | 8.01E+02 | 5.90E+02 | 4.34E+02 | 3.20E+02 | 2.35E+02 | 1.73E+02 |
| Xe-135m | 2.12E-03 | 1.55E-03 | 1.13E-03 | 8.28E-04 | 6.05E-04 | 4.42E-04 | 3.23E-04 | 2.36E-04 | 1.72E-04 |
| Y-90    | 4.46E+00 | 3.37E+00 | 2.54E+00 | 1.91E+00 | 1.44E+00 | 1.09E+00 | 8.19E-01 | 6.17E-01 | 4.65E-01 |
| Y-91    | 2.16E+00 | 1.62E+00 | 1.22E+00 | 9.09E-01 | 6.84E-01 | 5.13E-01 | 3.85E-01 | 2.89E-01 | 2.16E-01 |
| Y-91m   | 1.58E-02 | 1.17E-02 | 8.60E-03 | 6.33E-03 | 4.66E-03 | 3.43E-03 | 2.53E-03 | 1.86E-03 | 1.37E-03 |
| Y-92    | 3.83E-10 | 2.74E-10 | 1.95E-10 | 1.40E-10 | 9.99E-11 | 7.14E-11 | 5.10E-11 | 3.65E-11 | 0.00E+00 |
| Y-93    | 3.59E-04 | 2.65E-04 | 1.95E-04 | 1.44E-04 | 1.06E-04 | 7.81E-05 | 5.76E-05 | 4.25E-05 | 3.13E-05 |
| Zr-95   | 3.02E+00 | 2.27E+00 | 1.70E+00 | 1.28E+00 | 9.54E-01 | 7.16E-01 | 5.37E-01 | 4.03E-01 | 3.02E-01 |
| Zr-97   | 1.85E-02 | 1.38E-02 | 1.03E-02 | 7.60E-03 | 5.64E-03 | 4.19E-03 | 3.11E-03 | 2.30E-03 | 1.71E-03 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 21:20    | 21:35    | 21:50    | 22:05    | 22:20    | 22:35    | 22:50    | 23:05    | 23:20    | 23:35    |
| 6.04E-07 | 4.55E-07 | 3.42E-07 | 2.57E-07 | 1.94E-07 | 1.46E-07 | 1.10E-07 | 8.25E-08 | 6.21E-08 | 4.67E-08 |
| 1.93E+01 | 1.45E+01 | 1.08E+01 | 8.13E+00 | 6.09E+00 | 4.56E+00 | 3.42E+00 | 2.57E+00 | 1.93E+00 | 1.44E+00 |
| 5.33E-01 | 4.00E-01 | 3.00E-01 | 2.25E-01 | 1.68E-01 | 1.26E-01 | 9.45E-02 | 7.10E-02 | 5.33E-02 | 4.00E-02 |
| 3.83E-02 | 2.85E-02 | 2.12E-02 | 1.58E-02 | 1.19E-02 | 8.84E-03 | 6.60E-03 | 4.92E-03 | 3.67E-03 | 2.74E-03 |
| 4.73E-01 | 3.55E-01 | 2.66E-01 | 1.99E-01 | 1.49E-01 | 1.13E-01 | 8.41E-02 | 6.30E-02 | 4.73E-02 | 3.55E-02 |
| 5.92E-03 | 4.44E-03 | 3.33E-03 | 2.49E-03 | 1.87E-03 | 1.40E-03 | 1.05E-03 | 7.90E-04 | 5.92E-04 | 4.45E-04 |
| 2.77E+01 | 2.08E+01 | 1.56E+01 | 1.17E+01 | 8.78E+00 | 6.59E+00 | 4.94E+00 | 3.71E+00 | 2.78E+00 | 2.08E+00 |
| 8.60E+00 | 6.44E+00 | 4.83E+00 | 3.63E+00 | 2.72E+00 | 2.03E+00 | 1.53E+00 | 1.14E+00 | 8.58E-01 | 6.43E-01 |
| 1.93E+01 | 1.45E+01 | 1.08E+01 | 8.14E+00 | 6.10E+00 | 4.57E+00 | 3.43E+00 | 2.57E+00 | 1.93E+00 | 1.45E+00 |
| 1.57E+02 | 1.18E+02 | 8.81E+01 | 6.61E+01 | 4.95E+01 | 3.71E+01 | 2.78E+01 | 2.08E+01 | 1.56E+01 | 1.17E+01 |
| 1.73E+01 | 1.30E+01 | 9.72E+00 | 7.25E+00 | 5.42E+00 | 4.06E+00 | 3.03E+00 | 2.27E+00 | 1.70E+00 | 1.27E+00 |
| 7.18E+00 | 5.35E+00 | 3.98E+00 | 2.95E+00 | 2.20E+00 | 1.64E+00 | 1.22E+00 | 9.09E-01 | 6.73E-01 | 5.00E-01 |
| 7.85E-04 | 5.73E-04 | 4.19E-04 | 3.06E-04 | 2.24E-04 | 1.64E-04 | 1.20E-04 | 8.72E-05 | 6.37E-05 | 4.65E-05 |
| 3.49E+03 | 2.62E+03 | 1.96E+03 | 1.48E+03 | 1.11E+03 | 8.29E+02 | 6.22E+02 | 4.66E+02 | 3.50E+02 | 2.62E+02 |
| 3.23E-04 | 2.33E-04 | 1.68E-04 | 1.22E-04 | 8.77E-05 | 6.33E-05 | 4.56E-05 | 3.29E-05 | 2.38E-05 | 1.72E-05 |
| 9.72E-09 | 6.83E-09 | 4.82E-09 | 3.40E-09 | 2.39E-09 | 1.69E-09 | 1.20E-09 | 8.42E-10 | 5.94E-10 | 4.19E-10 |
| 9.90E+00 | 7.43E+00 | 5.60E+00 | 4.21E+00 | 3.18E+00 | 2.39E+00 | 1.80E+00 | 1.36E+00 | 1.02E+00 | 7.68E-01 |
| 4.89E-11 | 3.51E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 8.82E-01 | 6.60E-01 | 4.93E-01 | 3.69E-01 | 2.76E-01 | 2.06E-01 | 1.55E-01 | 1.15E-01 | 8.64E-02 | 6.46E-02 |
| 2.42E-01 | 1.82E-01 | 1.36E-01 | 1.03E-01 | 7.67E-02 | 5.75E-02 | 4.31E-02 | 3.23E-02 | 2.42E-02 | 1.82E-02 |
| 7.25E-05 | 5.38E-05 | 4.00E-05 | 2.97E-05 | 2.21E-05 | 1.64E-05 | 1.22E-05 | 9.00E-06 | 6.69E-06 | 4.97E-06 |
| 6.79E-02 | 5.09E-02 | 3.82E-02 | 2.85E-02 | 2.14E-02 | 1.60E-02 | 1.21E-02 | 9.00E-03 | 6.76E-03 | 5.07E-03 |
| 1.64E+00 | 1.22E+00 | 9.18E-01 | 6.83E-01 | 5.10E-01 | 3.82E-01 | 2.85E-01 | 2.13E-01 | 1.59E-01 | 1.20E-01 |
| 3.07E-04 | 2.30E-04 | 1.73E-04 | 1.30E-04 | 9.72E-05 | 7.34E-05 | 5.51E-05 | 4.14E-05 | 3.11E-05 | 2.34E-05 |
| 1.64E-01 | 1.22E-01 | 9.18E-02 | 6.89E-02 | 5.17E-02 | 3.87E-02 | 2.91E-02 | 2.18E-02 | 1.63E-02 | 1.22E-02 |
| 4.73E-01 | 3.55E-01 | 2.66E-01 | 1.99E-01 | 1.49E-01 | 1.13E-01 | 8.41E-02 | 6.30E-02 | 4.73E-02 | 3.55E-02 |
| 1.40E-06 | 1.05E-06 | 7.88E-07 | 5.91E-07 | 4.45E-07 | 3.34E-07 | 2.50E-07 | 1.88E-07 | 1.41E-07 | 1.06E-07 |
| 1.63E-06 | 1.22E-06 | 9.18E-07 | 6.88E-07 | 5.16E-07 | 3.87E-07 | 2.91E-07 | 2.19E-07 | 1.64E-07 | 1.23E-07 |
| 4.47E-02 | 3.36E-02 | 2.52E-02 | 1.89E-02 | 1.41E-02 | 1.06E-02 | 7.97E-03 | 5.97E-03 | 4.48E-03 | 3.36E-03 |
| 3.32E-01 | 2.49E-01 | 1.86E-01 | 1.40E-01 | 1.05E-01 | 7.87E-02 | 5.90E-02 | 4.42E-02 | 3.31E-02 | 2.48E-02 |
| 1.08E-08 | 7.63E-09 | 5.38E-09 | 3.80E-09 | 2.68E-09 | 1.89E-09 | 1.33E-09 | 9.45E-10 | 6.63E-10 | 4.68E-10 |
| 2.66E+00 | 2.00E+00 | 1.50E+00 | 1.13E+00 | 8.43E-01 | 6.33E-01 | 4.74E-01 | 3.56E-01 | 2.66E-01 | 2.00E-01 |
| 1.83E-01 | 1.37E-01 | 1.02E-01 | 7.60E-02 | 5.67E-02 | 4.23E-02 | 3.16E-02 | 2.36E-02 | 1.76E-02 | 1.31E-02 |
| 2.67E+00 | 2.01E+00 | 1.50E+00 | 1.13E+00 | 8.45E-01 | 6.34E-01 | 4.75E-01 | 3.56E-01 | 2.67E-01 | 2.01E-01 |
| 5.43E-09 | 3.92E-09 | 2.83E-09 | 2.03E-09 | 1.47E-09 | 1.06E-09 | 7.64E-10 | 5.51E-10 | 3.98E-10 | 2.86E-10 |
| 8.06E-01 | 6.05E-01 | 4.54E-01 | 3.40E-01 | 2.55E-01 | 1.92E-01 | 1.43E-01 | 1.08E-01 | 8.07E-02 | 6.06E-02 |
| 1.25E+00 | 9.36E-01 | 7.00E-01 | 5.25E-01 | 3.92E-01 | 2.93E-01 | 2.20E-01 | 1.65E-01 | 1.23E-01 | 9.27E-02 |
| 1.77E-08 | 1.28E-08 | 9.27E-09 | 6.65E-09 | 4.79E-09 | 3.45E-09 | 2.48E-09 | 1.79E-09 | 1.29E-09 | 9.27E-10 |
| 1.22E+01 | 9.09E+00 | 6.81E+00 | 5.11E+00 | 3.83E+00 | 2.87E+00 | 2.15E+00 | 1.62E+00 | 1.22E+00 | 9.09E-01 |
| 1.01E+00 | 7.53E-01 | 5.65E-01 | 4.24E-01 | 3.18E-01 | 2.39E-01 | 1.79E-01 | 1.34E-01 | 1.01E-01 | 7.54E-02 |
| 1.59E-03 | 1.17E-03 | 8.65E-04 | 6.37E-04 | 4.69E-04 | 3.46E-04 | 2.55E-04 | 1.87E-04 | 1.38E-04 | 1.02E-04 |

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 8.50E-01 | 6.35E-01 | 4.75E-01 | 3.56E-01 | 2.66E-01 | 1.99E-01 | 1.49E-01 | 1.12E-01 | 8.33E-02 | 6.24E-02 |
| 1.91E+00 | 1.43E+00 | 1.07E+00 | 8.02E-01 | 6.01E-01 | 4.50E-01 | 3.38E-01 | 2.52E-01 | 1.89E-01 | 1.41E-01 |
| 5.31E-01 | 3.98E-01 | 2.99E-01 | 2.24E-01 | 1.68E-01 | 1.26E-01 | 9.45E-02 | 7.08E-02 | 5.31E-02 | 3.99E-02 |
| 1.33E+00 | 9.99E-01 | 7.50E-01 | 5.63E-01 | 4.22E-01 | 3.16E-01 | 2.37E-01 | 1.78E-01 | 1.33E-01 | 9.99E-02 |
| 2.05E+00 | 1.54E+00 | 1.15E+00 | 8.64E-01 | 6.48E-01 | 4.86E-01 | 3.65E-01 | 2.73E-01 | 2.05E-01 | 1.54E-01 |
| 8.84E-02 | 6.59E-02 | 4.91E-02 | 3.66E-02 | 2.74E-02 | 2.03E-02 | 1.52E-02 | 1.13E-02 | 8.45E-03 | 6.30E-03 |
| 3.92E-01 | 2.93E-01 | 2.19E-01 | 1.63E-01 | 1.22E-01 | 9.09E-02 | 6.75E-02 | 5.03E-02 | 3.75E-02 | 2.80E-02 |
| 1.67E+01 | 1.26E+01 | 9.36E+00 | 7.03E+00 | 5.27E+00 | 3.94E+00 | 2.94E+00 | 2.21E+00 | 1.65E+00 | 1.23E+00 |
| 4.34E+03 | 3.26E+03 | 2.44E+03 | 1.83E+03 | 1.37E+03 | 1.03E+03 | 7.70E+02 | 5.77E+02 | 4.33E+02 | 3.24E+02 |
| 4.44E+05 | 3.32E+05 | 2.49E+05 | 1.86E+05 | 1.40E+05 | 1.04E+05 | 7.84E+04 | 5.87E+04 | 4.39E+04 | 3.29E+04 |
| 5.24E+03 | 3.92E+03 | 2.93E+03 | 2.19E+03 | 1.64E+03 | 1.22E+03 | 9.18E+02 | 6.84E+02 | 5.11E+02 | 3.83E+02 |
| 1.27E+02 | 9.36E+01 | 6.89E+01 | 5.07E+01 | 3.73E+01 | 2.75E+01 | 2.02E+01 | 1.49E+01 | 1.09E+01 | 8.05E+00 |
| 1.26E-04 | 9.18E-05 | 6.71E-05 | 4.91E-05 | 3.58E-05 | 2.62E-05 | 1.92E-05 | 1.40E-05 | 1.02E-05 | 7.46E-06 |
| 3.51E-01 | 2.65E-01 | 2.00E-01 | 1.50E-01 | 1.13E-01 | 8.53E-02 | 6.44E-02 | 4.85E-02 | 3.65E-02 | 2.75E-02 |
| 1.62E-01 | 1.22E-01 | 9.09E-02 | 6.84E-02 | 5.13E-02 | 3.85E-02 | 2.89E-02 | 2.16E-02 | 1.62E-02 | 1.22E-02 |
| 1.01E-03 | 7.43E-04 | 5.47E-04 | 4.03E-04 | 2.97E-04 | 2.19E-04 | 1.61E-04 | 1.19E-04 | 8.73E-05 | 6.44E-05 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.31E-05 | 1.70E-05 | 1.25E-05 | 9.27E-06 | 6.82E-06 | 5.03E-06 | 3.71E-06 | 2.74E-06 | 2.02E-06 | 1.49E-06 |
| 2.27E-01 | 1.70E-01 | 1.28E-01 | 9.54E-02 | 7.17E-02 | 5.37E-02 | 4.03E-02 | 3.02E-02 | 2.27E-02 | 1.70E-02 |
| 1.27E-03 | 9.45E-04 | 7.00E-04 | 5.20E-04 | 3.86E-04 | 2.86E-04 | 2.12E-04 | 1.58E-04 | 1.17E-04 | 8.70E-05 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | ##### |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------|
| 23:50    | 0:05     | 0:20     | 0:35     | 0:50     | 1:05     | 1:20     | 1:35     | 1:50     | 2:05     |       |
| 3.52E-08 | 2.65E-08 | 1.99E-08 | 1.49E-08 | 1.13E-08 | 8.48E-09 | 6.38E-09 | 4.80E-09 | 3.61E-09 | 2.72E-09 |       |
| 1.08E+00 | 8.10E-01 | 6.08E-01 | 4.55E-01 | 3.41E-01 | 2.56E-01 | 1.92E-01 | 1.44E-01 | 1.08E-01 | 8.07E-02 |       |
| 3.00E-02 | 2.24E-02 | 1.68E-02 | 1.26E-02 | 9.45E-03 | 7.10E-03 | 5.32E-03 | 3.99E-03 | 2.99E-03 | 2.24E-03 |       |
| 2.04E-03 | 1.52E-03 | 1.13E-03 | 8.49E-04 | 6.34E-04 | 4.73E-04 | 3.53E-04 | 2.63E-04 | 1.96E-04 | 1.47E-04 |       |
| 2.66E-02 | 2.00E-02 | 1.49E-02 | 1.13E-02 | 8.42E-03 | 6.31E-03 | 4.73E-03 | 3.55E-03 | 2.66E-03 | 2.00E-03 |       |
| 3.33E-04 | 2.50E-04 | 1.87E-04 | 1.40E-04 | 1.05E-04 | 7.90E-05 | 5.93E-05 | 4.45E-05 | 3.34E-05 | 2.50E-05 |       |
| 1.57E+00 | 1.17E+00 | 8.79E-01 | 6.59E-01 | 4.94E-01 | 3.71E-01 | 2.78E-01 | 2.09E-01 | 1.57E-01 | 1.17E-01 |       |
| 4.82E-01 | 3.61E-01 | 2.71E-01 | 2.03E-01 | 1.52E-01 | 1.14E-01 | 8.54E-02 | 6.41E-02 | 4.81E-02 | 3.60E-02 |       |
| 1.09E+00 | 8.15E-01 | 6.10E-01 | 4.58E-01 | 3.44E-01 | 2.57E-01 | 1.94E-01 | 1.45E-01 | 1.09E-01 | 8.15E-02 |       |
| 8.76E+00 | 6.56E+00 | 4.92E+00 | 3.69E+00 | 2.76E+00 | 2.07E+00 | 1.55E+00 | 1.16E+00 | 8.71E-01 | 6.53E-01 |       |
| 9.54E-01 | 7.13E-01 | 5.33E-01 | 3.99E-01 | 2.99E-01 | 2.23E-01 | 1.67E-01 | 1.25E-01 | 9.36E-02 | 7.01E-02 |       |
| 3.73E-01 | 2.77E-01 | 2.06E-01 | 1.53E-01 | 1.14E-01 | 8.47E-02 | 6.30E-02 | 4.69E-02 | 3.48E-02 | 2.59E-02 |       |
| 3.40E-05 | 2.48E-05 | 1.82E-05 | 1.32E-05 | 9.72E-06 | 7.07E-06 | 5.17E-06 | 3.78E-06 | 2.76E-06 | 2.02E-06 |       |
| 1.97E+02 | 1.48E+02 | 1.11E+02 | 8.30E+01 | 6.22E+01 | 4.67E+01 | 3.50E+01 | 2.63E+01 | 1.97E+01 | 1.48E+01 |       |
| 1.24E-05 | 8.93E-06 | 6.44E-06 | 4.65E-06 | 3.36E-06 | 2.42E-06 | 1.75E-06 | 1.26E-06 | 9.09E-07 | 6.57E-07 |       |
| 2.95E-10 | 2.09E-10 | 1.47E-10 | 1.04E-10 | 7.32E-11 | 5.17E-11 | 3.65E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 5.78E-01 | 4.36E-01 | 3.28E-01 | 2.47E-01 | 1.85E-01 | 1.40E-01 | 1.05E-01 | 7.91E-02 | 5.96E-02 | 4.48E-02 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 4.83E-02 | 3.62E-02 | 2.71E-02 | 2.03E-02 | 1.51E-02 | 1.13E-02 | 8.48E-03 | 6.34E-03 | 4.74E-03 | 3.55E-03 |       |
| 1.37E-02 | 1.03E-02 | 7.68E-03 | 5.75E-03 | 4.32E-03 | 3.24E-03 | 2.43E-03 | 1.82E-03 | 1.37E-03 | 1.03E-03 |       |
| 3.69E-06 | 2.74E-06 | 2.03E-06 | 1.51E-06 | 1.12E-06 | 8.31E-07 | 6.17E-07 | 4.58E-07 | 3.40E-07 | 2.52E-07 |       |
| 3.80E-03 | 2.84E-03 | 2.13E-03 | 1.60E-03 | 1.20E-03 | 8.98E-04 | 6.73E-04 | 5.04E-04 | 3.78E-04 | 2.84E-04 |       |
| 8.93E-02 | 6.67E-02 | 4.99E-02 | 3.74E-02 | 2.79E-02 | 2.09E-02 | 1.56E-02 | 1.17E-02 | 8.72E-03 | 6.52E-03 |       |
| 1.76E-05 | 1.31E-05 | 9.90E-06 | 7.43E-06 | 5.59E-06 | 4.19E-06 | 3.15E-06 | 2.37E-06 | 1.78E-06 | 1.34E-06 |       |
| 9.18E-03 | 6.87E-03 | 5.15E-03 | 3.86E-03 | 2.90E-03 | 2.17E-03 | 1.63E-03 | 1.22E-03 | 9.18E-04 | 6.85E-04 |       |
| 2.66E-02 | 2.00E-02 | 1.49E-02 | 1.13E-02 | 8.42E-03 | 6.31E-03 | 4.73E-03 | 3.55E-03 | 2.66E-03 | 2.00E-03 |       |
| 7.95E-08 | 5.97E-08 | 4.48E-08 | 3.37E-08 | 2.53E-08 | 1.90E-08 | 1.42E-08 | 1.07E-08 | 8.02E-09 | 6.02E-09 |       |
| 9.27E-08 | 6.93E-08 | 5.20E-08 | 3.91E-08 | 2.93E-08 | 2.20E-08 | 1.65E-08 | 1.24E-08 | 9.27E-09 | 6.98E-09 |       |
| 2.52E-03 | 1.89E-03 | 1.41E-03 | 1.06E-03 | 7.97E-04 | 5.98E-04 | 4.48E-04 | 3.37E-04 | 2.52E-04 | 1.89E-04 |       |
| 1.86E-02 | 1.40E-02 | 1.04E-02 | 7.85E-03 | 5.89E-03 | 4.41E-03 | 3.30E-03 | 2.48E-03 | 1.86E-03 | 1.40E-03 |       |
| 3.30E-10 | 2.33E-10 | 1.65E-10 | 1.16E-10 | 8.18E-11 | 5.77E-11 | 4.07E-11 | 2.87E-11 | 0.00E+00 | 0.00E+00 |       |
| 1.50E-01 | 1.13E-01 | 8.43E-02 | 6.32E-02 | 4.74E-02 | 3.56E-02 | 2.66E-02 | 2.00E-02 | 1.50E-02 | 1.13E-02 |       |
| 9.81E-03 | 7.31E-03 | 5.45E-03 | 4.07E-03 | 3.04E-03 | 2.27E-03 | 1.69E-03 | 1.26E-03 | 9.45E-04 | 7.04E-04 |       |
| 1.50E-01 | 1.13E-01 | 8.44E-02 | 6.34E-02 | 4.75E-02 | 3.56E-02 | 2.67E-02 | 2.00E-02 | 1.50E-02 | 1.13E-02 |       |
| 2.07E-10 | 1.49E-10 | 1.08E-10 | 7.76E-11 | 5.60E-11 | 4.04E-11 | 2.92E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 4.54E-02 | 3.40E-02 | 2.56E-02 | 1.92E-02 | 1.44E-02 | 1.08E-02 | 8.08E-03 | 6.06E-03 | 4.55E-03 | 3.41E-03 |       |
| 6.91E-02 | 5.18E-02 | 3.87E-02 | 2.90E-02 | 2.17E-02 | 1.62E-02 | 1.22E-02 | 9.09E-03 | 6.81E-03 | 5.10E-03 |       |
| 6.71E-10 | 4.83E-10 | 3.48E-10 | 2.51E-10 | 1.81E-10 | 1.31E-10 | 9.36E-11 | 6.76E-11 | 4.87E-11 | 3.51E-11 |       |
| 6.81E-01 | 5.11E-01 | 3.83E-01 | 2.87E-01 | 2.15E-01 | 1.62E-01 | 1.22E-01 | 9.09E-02 | 6.81E-02 | 5.11E-02 |       |
| 5.65E-02 | 4.24E-02 | 3.18E-02 | 2.39E-02 | 1.79E-02 | 1.34E-02 | 1.01E-02 | 7.55E-03 | 5.66E-03 | 4.25E-03 |       |
| 7.48E-05 | 5.51E-05 | 4.06E-05 | 2.99E-05 | 2.21E-05 | 1.62E-05 | 1.20E-05 | 8.79E-06 | 6.47E-06 | 4.77E-06 |       |

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 4.66E-02 | 3.49E-02 | 2.61E-02 | 1.95E-02 | 1.46E-02 | 1.09E-02 | 8.17E-03 | 6.11E-03 | 4.57E-03 | 3.42E-03 |
| 1.06E-01 | 7.95E-02 | 5.95E-02 | 4.46E-02 | 3.34E-02 | 2.50E-02 | 1.87E-02 | 1.40E-02 | 1.05E-02 | 7.87E-03 |
| 2.99E-02 | 2.24E-02 | 1.68E-02 | 1.26E-02 | 9.45E-03 | 7.09E-03 | 5.32E-03 | 3.99E-03 | 2.99E-03 | 2.24E-03 |
| 7.50E-02 | 5.62E-02 | 4.21E-02 | 3.16E-02 | 2.37E-02 | 1.77E-02 | 1.33E-02 | 9.99E-03 | 7.49E-03 | 5.62E-03 |
| 1.15E-01 | 8.63E-02 | 6.47E-02 | 4.85E-02 | 3.64E-02 | 2.73E-02 | 2.04E-02 | 1.54E-02 | 1.15E-02 | 8.63E-03 |
| 4.70E-03 | 3.50E-03 | 2.61E-03 | 1.94E-03 | 1.45E-03 | 1.08E-03 | 8.07E-04 | 6.02E-04 | 4.49E-04 | 3.35E-04 |
| 2.09E-02 | 1.56E-02 | 1.16E-02 | 8.65E-03 | 6.45E-03 | 4.82E-03 | 3.59E-03 | 2.67E-03 | 2.00E-03 | 1.49E-03 |
| 9.27E-01 | 6.91E-01 | 5.18E-01 | 3.87E-01 | 2.90E-01 | 2.17E-01 | 1.62E-01 | 1.22E-01 | 9.09E-02 | 6.80E-02 |
| 2.43E+02 | 1.82E+02 | 1.37E+02 | 1.03E+02 | 7.67E+01 | 5.75E+01 | 4.31E+01 | 3.23E+01 | 2.42E+01 | 1.82E+01 |
| 2.47E+04 | 1.85E+04 | 1.39E+04 | 1.04E+04 | 7.76E+03 | 5.81E+03 | 4.36E+03 | 3.26E+03 | 2.44E+03 | 1.83E+03 |
| 2.85E+02 | 2.13E+02 | 1.59E+02 | 1.20E+02 | 8.92E+01 | 6.67E+01 | 4.99E+01 | 3.73E+01 | 2.78E+01 | 2.08E+01 |
| 5.92E+00 | 4.36E+00 | 3.20E+00 | 2.36E+00 | 1.74E+00 | 1.28E+00 | 9.36E-01 | 6.91E-01 | 5.09E-01 | 3.74E-01 |
| 5.45E-06 | 3.98E-06 | 2.91E-06 | 2.12E-06 | 1.56E-06 | 1.13E-06 | 8.29E-07 | 6.06E-07 | 4.42E-07 | 3.23E-07 |
| 2.07E-02 | 1.57E-02 | 1.18E-02 | 8.87E-03 | 6.69E-03 | 5.04E-03 | 3.80E-03 | 2.86E-03 | 2.15E-03 | 1.62E-03 |
| 9.09E-03 | 6.85E-03 | 5.13E-03 | 3.85E-03 | 2.89E-03 | 2.17E-03 | 1.62E-03 | 1.22E-03 | 9.09E-04 | 6.85E-04 |
| 4.73E-05 | 3.49E-05 | 2.57E-05 | 1.89E-05 | 1.40E-05 | 1.03E-05 | 7.56E-06 | 5.56E-06 | 4.10E-06 | 3.02E-06 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.10E-06 | 8.07E-07 | 5.96E-07 | 4.39E-07 | 3.24E-07 | 2.39E-07 | 1.76E-07 | 1.30E-07 | 9.54E-08 | 7.05E-08 |
| 1.28E-02 | 9.54E-03 | 7.17E-03 | 5.38E-03 | 4.03E-03 | 3.02E-03 | 2.27E-03 | 1.70E-03 | 1.28E-03 | 9.54E-04 |
| 6.46E-05 | 4.80E-05 | 3.56E-05 | 2.65E-05 | 1.96E-05 | 1.46E-05 | 1.08E-05 | 8.03E-06 | 5.96E-06 | 4.42E-06 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | ##### |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------|
| 2:20     | 2:35     | 2:50     | 3:05     | 3:20     | 3:35     | 3:50     | 4:05     | 4:20     | 4:35     |       |
| 2.04E-09 | 1.54E-09 | 1.16E-09 | 8.71E-10 | 6.55E-10 | 4.93E-10 | 3.71E-10 | 2.79E-10 | 2.10E-10 | 1.58E-10 |       |
| 6.05E-02 | 4.54E-02 | 3.40E-02 | 2.55E-02 | 1.91E-02 | 1.43E-02 | 1.07E-02 | 8.05E-03 | 6.03E-03 | 4.52E-03 |       |
| 1.68E-03 | 1.26E-03 | 9.45E-04 | 7.09E-04 | 5.32E-04 | 3.99E-04 | 2.99E-04 | 2.24E-04 | 1.68E-04 | 1.26E-04 |       |
| 1.09E-04 | 8.15E-05 | 6.08E-05 | 4.54E-05 | 3.38E-05 | 2.53E-05 | 1.88E-05 | 1.40E-05 | 1.05E-05 | 7.82E-06 |       |
| 1.49E-03 | 1.13E-03 | 8.42E-04 | 6.32E-04 | 4.73E-04 | 3.56E-04 | 2.66E-04 | 2.00E-04 | 1.49E-04 | 1.13E-04 |       |
| 1.87E-05 | 1.40E-05 | 1.05E-05 | 7.91E-06 | 5.93E-06 | 4.45E-06 | 3.34E-06 | 2.50E-06 | 1.88E-06 | 1.40E-06 |       |
| 8.80E-02 | 6.60E-02 | 4.95E-02 | 3.71E-02 | 2.78E-02 | 2.09E-02 | 1.57E-02 | 1.17E-02 | 8.81E-03 | 6.61E-03 |       |
| 2.70E-02 | 2.03E-02 | 1.51E-02 | 1.13E-02 | 8.51E-03 | 6.38E-03 | 4.79E-03 | 3.59E-03 | 2.69E-03 | 2.02E-03 |       |
| 6.11E-02 | 4.58E-02 | 3.44E-02 | 2.58E-02 | 1.94E-02 | 1.45E-02 | 1.09E-02 | 8.16E-03 | 6.12E-03 | 4.59E-03 |       |
| 4.89E-01 | 3.66E-01 | 2.75E-01 | 2.06E-01 | 1.54E-01 | 1.15E-01 | 8.66E-02 | 6.49E-02 | 4.86E-02 | 3.65E-02 |       |
| 5.25E-02 | 3.92E-02 | 2.93E-02 | 2.20E-02 | 1.65E-02 | 1.23E-02 | 9.18E-03 | 6.89E-03 | 5.16E-03 | 3.86E-03 |       |
| 1.93E-02 | 1.43E-02 | 1.07E-02 | 7.94E-03 | 5.90E-03 | 4.39E-03 | 3.27E-03 | 2.43E-03 | 1.81E-03 | 1.34E-03 |       |
| 1.48E-06 | 1.08E-06 | 7.86E-07 | 5.74E-07 | 4.19E-07 | 3.07E-07 | 2.24E-07 | 1.64E-07 | 1.20E-07 | 8.73E-08 |       |
| 1.11E+01 | 8.31E+00 | 6.23E+00 | 4.67E+00 | 3.50E+00 | 2.63E+00 | 1.97E+00 | 1.48E+00 | 1.11E+00 | 8.32E-01 |       |
| 4.73E-07 | 3.42E-07 | 2.47E-07 | 1.78E-07 | 1.29E-07 | 9.27E-08 | 6.69E-08 | 4.82E-08 | 3.48E-08 | 2.51E-08 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 3.38E-02 | 2.54E-02 | 1.91E-02 | 1.44E-02 | 1.08E-02 | 8.15E-03 | 6.13E-03 | 4.61E-03 | 3.47E-03 | 2.61E-03 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 2.66E-03 | 1.99E-03 | 1.49E-03 | 1.11E-03 | 8.31E-04 | 6.21E-04 | 4.64E-04 | 3.47E-04 | 2.60E-04 | 1.94E-04 |       |
| 7.68E-04 | 5.76E-04 | 4.32E-04 | 3.24E-04 | 2.43E-04 | 1.83E-04 | 1.37E-04 | 1.03E-04 | 7.69E-05 | 5.77E-05 |       |
| 1.87E-07 | 1.40E-07 | 1.04E-07 | 7.67E-08 | 5.69E-08 | 4.22E-08 | 3.13E-08 | 2.33E-08 | 1.73E-08 | 1.29E-08 |       |
| 2.12E-04 | 1.59E-04 | 1.20E-04 | 8.95E-05 | 6.71E-05 | 5.02E-05 | 3.76E-05 | 2.83E-05 | 2.12E-05 | 1.58E-05 |       |
| 4.88E-03 | 3.65E-03 | 2.73E-03 | 2.03E-03 | 1.52E-03 | 1.14E-03 | 8.51E-04 | 6.37E-04 | 4.76E-04 | 3.56E-04 |       |
| 1.01E-06 | 7.54E-07 | 5.67E-07 | 4.26E-07 | 3.20E-07 | 2.40E-07 | 1.80E-07 | 1.36E-07 | 1.02E-07 | 7.65E-08 |       |
| 5.13E-04 | 3.85E-04 | 2.89E-04 | 2.16E-04 | 1.62E-04 | 1.22E-04 | 9.09E-05 | 6.83E-05 | 5.12E-05 | 3.83E-05 |       |
| 1.49E-03 | 1.13E-03 | 8.42E-04 | 6.32E-04 | 4.73E-04 | 3.56E-04 | 2.66E-04 | 2.00E-04 | 1.49E-04 | 1.13E-04 |       |
| 4.52E-09 | 3.39E-09 | 2.55E-09 | 1.91E-09 | 1.43E-09 | 1.08E-09 | 8.09E-10 | 6.08E-10 | 4.56E-10 | 3.42E-10 |       |
| 5.24E-09 | 3.93E-09 | 2.95E-09 | 2.21E-09 | 1.67E-09 | 1.25E-09 | 9.36E-10 | 7.03E-10 | 5.27E-10 | 3.96E-10 |       |
| 1.42E-04 | 1.06E-04 | 7.98E-05 | 5.99E-05 | 4.49E-05 | 3.37E-05 | 2.53E-05 | 1.89E-05 | 1.42E-05 | 1.06E-05 |       |
| 1.04E-03 | 7.83E-04 | 5.87E-04 | 4.40E-04 | 3.30E-04 | 2.48E-04 | 1.85E-04 | 1.40E-04 | 1.04E-04 | 7.82E-05 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 8.42E-03 | 6.32E-03 | 4.73E-03 | 3.56E-03 | 2.66E-03 | 2.00E-03 | 1.49E-03 | 1.13E-03 | 8.42E-04 | 6.32E-04 |       |
| 5.26E-04 | 3.92E-04 | 2.93E-04 | 2.19E-04 | 1.63E-04 | 1.22E-04 | 9.09E-05 | 6.78E-05 | 5.06E-05 | 3.77E-05 |       |
| 8.44E-03 | 6.33E-03 | 4.75E-03 | 3.56E-03 | 2.67E-03 | 2.00E-03 | 1.50E-03 | 1.13E-03 | 8.44E-04 | 6.33E-04 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 2.56E-03 | 1.92E-03 | 1.44E-03 | 1.08E-03 | 8.09E-04 | 6.07E-04 | 4.55E-04 | 3.41E-04 | 2.56E-04 | 1.92E-04 |       |
| 3.82E-03 | 2.86E-03 | 2.14E-03 | 1.60E-03 | 1.20E-03 | 8.97E-04 | 6.72E-04 | 5.03E-04 | 3.76E-04 | 2.82E-04 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 3.83E-02 | 2.87E-02 | 2.15E-02 | 1.62E-02 | 1.22E-02 | 9.09E-03 | 6.81E-03 | 5.11E-03 | 3.83E-03 | 2.87E-03 |       |
| 3.19E-03 | 2.39E-03 | 1.79E-03 | 1.34E-03 | 1.01E-03 | 7.56E-04 | 5.67E-04 | 4.25E-04 | 3.19E-04 | 2.39E-04 |       |
| 3.51E-06 | 2.58E-06 | 1.91E-06 | 1.40E-06 | 1.04E-06 | 7.61E-07 | 5.60E-07 | 4.12E-07 | 3.04E-07 | 2.24E-07 |       |

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 2.56E-03 | 1.92E-03 | 1.43E-03 | 1.07E-03 | 8.01E-04 | 5.99E-04 | 4.48E-04 | 3.35E-04 | 2.51E-04 | 1.87E-04 |
| 5.90E-03 | 4.41E-03 | 3.30E-03 | 2.48E-03 | 1.85E-03 | 1.39E-03 | 1.04E-03 | 7.79E-04 | 5.83E-04 | 4.37E-04 |
| 1.68E-03 | 1.26E-03 | 9.45E-04 | 7.09E-04 | 5.32E-04 | 3.99E-04 | 3.00E-04 | 2.24E-04 | 1.68E-04 | 1.26E-04 |
| 4.21E-03 | 3.16E-03 | 2.37E-03 | 1.77E-03 | 1.33E-03 | 9.99E-04 | 7.49E-04 | 5.62E-04 | 4.21E-04 | 3.16E-04 |
| 6.47E-03 | 4.85E-03 | 3.64E-03 | 2.73E-03 | 2.04E-03 | 1.53E-03 | 1.15E-03 | 8.62E-04 | 6.47E-04 | 4.85E-04 |
| 2.49E-04 | 1.86E-04 | 1.39E-04 | 1.04E-04 | 7.72E-05 | 5.76E-05 | 4.29E-05 | 3.20E-05 | 2.39E-05 | 1.78E-05 |
| 1.11E-03 | 8.27E-04 | 6.17E-04 | 4.60E-04 | 3.43E-04 | 2.56E-04 | 1.91E-04 | 1.42E-04 | 1.06E-04 | 7.91E-05 |
| 5.09E-02 | 3.81E-02 | 2.85E-02 | 2.13E-02 | 1.59E-02 | 1.20E-02 | 8.94E-03 | 6.69E-03 | 5.00E-03 | 3.74E-03 |
| 1.36E+01 | 1.02E+01 | 7.64E+00 | 5.73E+00 | 4.29E+00 | 3.22E+00 | 2.41E+00 | 1.81E+00 | 1.36E+00 | 1.02E+00 |
| 1.37E+03 | 1.03E+03 | 7.69E+02 | 5.76E+02 | 4.31E+02 | 3.23E+02 | 2.42E+02 | 1.81E+02 | 1.36E+02 | 1.02E+02 |
| 1.56E+01 | 1.16E+01 | 8.69E+00 | 6.50E+00 | 4.86E+00 | 3.64E+00 | 2.72E+00 | 2.03E+00 | 1.52E+00 | 1.13E+00 |
| 2.75E-01 | 2.03E-01 | 1.49E-01 | 1.10E-01 | 8.07E-02 | 5.94E-02 | 4.37E-02 | 3.22E-02 | 2.37E-02 | 1.75E-02 |
| 2.36E-07 | 1.73E-07 | 1.26E-07 | 9.18E-08 | 6.72E-08 | 4.91E-08 | 3.59E-08 | 2.62E-08 | 1.92E-08 | 1.40E-08 |
| 1.22E-03 | 9.18E-04 | 6.93E-04 | 5.22E-04 | 3.93E-04 | 2.96E-04 | 2.23E-04 | 1.68E-04 | 1.27E-04 | 9.54E-05 |
| 5.13E-04 | 3.85E-04 | 2.89E-04 | 2.17E-04 | 1.62E-04 | 1.22E-04 | 9.09E-05 | 6.85E-05 | 5.14E-05 | 3.85E-05 |
| 2.22E-06 | 1.64E-06 | 1.21E-06 | 8.88E-07 | 6.54E-07 | 4.82E-07 | 3.55E-07 | 2.61E-07 | 1.93E-07 | 1.41E-07 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 5.19E-08 | 3.83E-08 | 2.83E-08 | 2.08E-08 | 1.54E-08 | 1.13E-08 | 8.34E-09 | 6.16E-09 | 4.54E-09 | 3.35E-09 |
| 7.17E-04 | 5.38E-04 | 4.03E-04 | 3.02E-04 | 2.27E-04 | 1.70E-04 | 1.28E-04 | 9.54E-05 | 7.17E-05 | 5.38E-05 |
| 3.29E-06 | 2.44E-06 | 1.81E-06 | 1.34E-06 | 9.99E-07 | 7.41E-07 | 5.50E-07 | 4.08E-07 | 3.02E-07 | 2.25E-07 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | ##### |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------|
| 4:50     | 5:05     | 5:20     | 5:35     | 5:50     | 6:05     | 6:20     | 6:35     | 6:50     | 7:05     |       |
| 1.19E-10 | 8.94E-11 | 6.72E-11 | 5.06E-11 | 3.81E-11 | 2.86E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 3.38E-03 | 2.54E-03 | 1.90E-03 | 1.43E-03 | 1.07E-03 | 8.02E-04 | 6.01E-04 | 4.50E-04 | 3.38E-04 | 2.53E-04 |       |
| 9.45E-05 | 7.09E-05 | 5.32E-05 | 3.99E-05 | 2.99E-05 | 2.24E-05 | 1.68E-05 | 1.26E-05 | 9.45E-06 | 7.08E-06 |       |
| 5.84E-06 | 4.36E-06 | 3.25E-06 | 2.42E-06 | 1.81E-06 | 1.35E-06 | 1.01E-06 | 7.52E-07 | 5.61E-07 | 4.19E-07 |       |
| 8.42E-05 | 6.32E-05 | 4.74E-05 | 3.56E-05 | 2.66E-05 | 2.00E-05 | 1.50E-05 | 1.13E-05 | 8.43E-06 | 6.33E-06 |       |
| 1.05E-06 | 7.92E-07 | 5.94E-07 | 4.46E-07 | 3.34E-07 | 2.50E-07 | 1.88E-07 | 1.41E-07 | 1.05E-07 | 7.93E-08 |       |
| 4.95E-03 | 3.72E-03 | 2.79E-03 | 2.09E-03 | 1.57E-03 | 1.18E-03 | 8.82E-04 | 6.62E-04 | 4.96E-04 | 3.72E-04 |       |
| 1.51E-03 | 1.13E-03 | 8.49E-04 | 6.36E-04 | 4.77E-04 | 3.57E-04 | 2.68E-04 | 2.01E-04 | 1.50E-04 | 1.13E-04 |       |
| 3.44E-03 | 2.58E-03 | 1.94E-03 | 1.45E-03 | 1.09E-03 | 8.17E-04 | 6.13E-04 | 4.60E-04 | 3.45E-04 | 2.58E-04 |       |
| 2.73E-02 | 2.04E-02 | 1.53E-02 | 1.15E-02 | 8.60E-03 | 6.44E-03 | 4.83E-03 | 3.62E-03 | 2.71E-03 | 2.03E-03 |       |
| 2.89E-03 | 2.16E-03 | 1.62E-03 | 1.22E-03 | 9.09E-04 | 6.78E-04 | 5.08E-04 | 3.80E-04 | 2.84E-04 | 2.12E-04 |       |
| 9.99E-04 | 7.43E-04 | 5.53E-04 | 4.11E-04 | 3.06E-04 | 2.28E-04 | 1.69E-04 | 1.26E-04 | 9.36E-05 | 6.96E-05 |       |
| 6.38E-08 | 4.66E-08 | 3.40E-08 | 2.48E-08 | 1.82E-08 | 1.32E-08 | 9.72E-09 | 7.08E-09 | 5.18E-09 | 3.78E-09 |       |
| 6.24E-01 | 4.68E-01 | 3.51E-01 | 2.63E-01 | 1.97E-01 | 1.48E-01 | 1.11E-01 | 8.33E-02 | 6.25E-02 | 4.68E-02 |       |
| 1.81E-08 | 1.31E-08 | 9.45E-09 | 6.81E-09 | 4.91E-09 | 3.55E-09 | 2.56E-09 | 1.85E-09 | 1.33E-09 | 9.63E-10 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 1.96E-03 | 1.48E-03 | 1.11E-03 | 8.36E-04 | 6.29E-04 | 4.73E-04 | 3.56E-04 | 2.67E-04 | 2.02E-04 | 1.51E-04 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 1.46E-04 | 1.09E-04 | 8.15E-05 | 6.09E-05 | 4.55E-05 | 3.41E-05 | 2.55E-05 | 1.91E-05 | 1.43E-05 | 1.07E-05 |       |
| 4.33E-05 | 3.24E-05 | 2.43E-05 | 1.83E-05 | 1.37E-05 | 1.03E-05 | 7.70E-06 | 5.77E-06 | 4.33E-06 | 3.25E-06 |       |
| 9.54E-09 | 7.07E-09 | 5.25E-09 | 3.90E-09 | 2.89E-09 | 2.15E-09 | 1.59E-09 | 1.18E-09 | 8.78E-10 | 6.52E-10 |       |
| 1.19E-05 | 8.90E-06 | 6.68E-06 | 5.00E-06 | 3.75E-06 | 2.81E-06 | 2.11E-06 | 1.58E-06 | 1.18E-06 | 8.87E-07 |       |
| 2.66E-04 | 1.99E-04 | 1.49E-04 | 1.12E-04 | 8.33E-05 | 6.22E-05 | 4.65E-05 | 3.47E-05 | 2.60E-05 | 1.94E-05 |       |
| 5.74E-08 | 4.31E-08 | 3.24E-08 | 2.43E-08 | 1.83E-08 | 1.38E-08 | 1.04E-08 | 7.75E-09 | 5.82E-09 | 4.37E-09 |       |
| 2.88E-05 | 2.16E-05 | 1.62E-05 | 1.22E-05 | 9.09E-06 | 6.80E-06 | 5.10E-06 | 3.83E-06 | 2.87E-06 | 2.15E-06 |       |
| 8.42E-05 | 6.32E-05 | 4.74E-05 | 3.56E-05 | 2.66E-05 | 2.00E-05 | 1.50E-05 | 1.13E-05 | 8.43E-06 | 6.33E-06 |       |
| 2.57E-10 | 1.93E-10 | 1.45E-10 | 1.09E-10 | 8.16E-11 | 6.13E-11 | 4.60E-11 | 3.46E-11 | 0.00E+00 | 0.00E+00 |       |
| 2.97E-10 | 2.23E-10 | 1.67E-10 | 1.26E-10 | 9.45E-11 | 7.08E-11 | 5.31E-11 | 3.99E-11 | 3.00E-11 | 0.00E+00 |       |
| 7.99E-06 | 5.99E-06 | 4.49E-06 | 3.37E-06 | 2.53E-06 | 1.90E-06 | 1.42E-06 | 1.06E-06 | 8.00E-07 | 5.99E-07 |       |
| 5.86E-05 | 4.39E-05 | 3.29E-05 | 2.47E-05 | 1.85E-05 | 1.39E-05 | 1.04E-05 | 7.80E-06 | 5.85E-06 | 4.38E-06 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 4.73E-04 | 3.56E-04 | 2.66E-04 | 2.00E-04 | 1.49E-04 | 1.13E-04 | 8.42E-05 | 6.32E-05 | 4.73E-05 | 3.55E-05 |       |
| 2.82E-05 | 2.11E-05 | 1.57E-05 | 1.17E-05 | 8.74E-06 | 6.52E-06 | 4.87E-06 | 3.64E-06 | 2.71E-06 | 2.03E-06 |       |
| 4.74E-04 | 3.56E-04 | 2.67E-04 | 2.00E-04 | 1.50E-04 | 1.13E-04 | 8.43E-05 | 6.33E-05 | 4.74E-05 | 3.56E-05 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 1.44E-04 | 1.08E-04 | 8.09E-05 | 6.08E-05 | 4.55E-05 | 3.41E-05 | 2.57E-05 | 1.92E-05 | 1.44E-05 | 1.08E-05 |       |
| 2.11E-04 | 1.58E-04 | 1.18E-04 | 8.85E-05 | 6.62E-05 | 4.96E-05 | 3.72E-05 | 2.78E-05 | 2.08E-05 | 1.56E-05 |       |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |       |
| 2.15E-03 | 1.62E-03 | 1.22E-03 | 9.09E-04 | 6.81E-04 | 5.11E-04 | 3.83E-04 | 2.87E-04 | 2.15E-04 | 1.62E-04 |       |
| 1.79E-04 | 1.34E-04 | 1.01E-04 | 7.57E-05 | 5.67E-05 | 4.26E-05 | 3.20E-05 | 2.39E-05 | 1.79E-05 | 1.35E-05 |       |
| 1.65E-07 | 1.22E-07 | 8.94E-08 | 6.58E-08 | 4.84E-08 | 3.57E-08 | 2.63E-08 | 1.94E-08 | 1.42E-08 | 1.05E-08 |       |



|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1.40E-04 | 1.05E-04 | 7.85E-05 | 5.87E-05 | 4.39E-05 | 3.29E-05 | 2.46E-05 | 1.84E-05 | 1.38E-05 | 1.03E-05 |
| 3.28E-04 | 2.45E-04 | 1.84E-04 | 1.38E-04 | 1.03E-04 | 7.71E-05 | 5.78E-05 | 4.33E-05 | 3.24E-05 | 2.43E-05 |
| 9.45E-05 | 7.10E-05 | 5.33E-05 | 4.00E-05 | 3.00E-05 | 2.25E-05 | 1.68E-05 | 1.26E-05 | 9.45E-06 | 7.11E-06 |
| 2.37E-04 | 1.77E-04 | 1.33E-04 | 9.99E-05 | 7.48E-05 | 5.61E-05 | 4.20E-05 | 3.16E-05 | 2.37E-05 | 1.77E-05 |
| 3.64E-04 | 2.73E-04 | 2.04E-04 | 1.53E-04 | 1.15E-04 | 8.62E-05 | 6.46E-05 | 4.84E-05 | 3.64E-05 | 2.73E-05 |
| 1.32E-05 | 9.90E-06 | 7.38E-06 | 5.51E-06 | 4.10E-06 | 3.06E-06 | 2.29E-06 | 1.70E-06 | 1.27E-06 | 9.45E-07 |
| 5.90E-05 | 4.40E-05 | 3.28E-05 | 2.45E-05 | 1.83E-05 | 1.36E-05 | 1.02E-05 | 7.56E-06 | 5.63E-06 | 4.20E-06 |
| 2.81E-03 | 2.10E-03 | 1.57E-03 | 1.18E-03 | 8.79E-04 | 6.58E-04 | 4.92E-04 | 3.68E-04 | 2.75E-04 | 2.06E-04 |
| 7.61E-01 | 5.71E-01 | 4.28E-01 | 3.20E-01 | 2.40E-01 | 1.80E-01 | 1.35E-01 | 1.01E-01 | 7.59E-02 | 5.69E-02 |
| 7.61E+01 | 5.70E+01 | 4.27E+01 | 3.20E+01 | 2.39E+01 | 1.79E+01 | 1.34E+01 | 1.01E+01 | 7.53E+00 | 5.64E+00 |
| 8.48E-01 | 6.34E-01 | 4.73E-01 | 3.55E-01 | 2.65E-01 | 1.98E-01 | 1.48E-01 | 1.11E-01 | 8.27E-02 | 6.18E-02 |
| 1.28E-02 | 9.45E-03 | 6.94E-03 | 5.11E-03 | 3.76E-03 | 2.76E-03 | 2.03E-03 | 1.49E-03 | 1.10E-03 | 8.11E-04 |
| 1.03E-08 | 7.47E-09 | 5.45E-09 | 3.99E-09 | 2.92E-09 | 2.12E-09 | 1.56E-09 | 1.13E-09 | 8.30E-10 | 6.06E-10 |
| 7.17E-05 | 5.40E-05 | 4.07E-05 | 3.06E-05 | 2.30E-05 | 1.74E-05 | 1.31E-05 | 9.81E-06 | 7.42E-06 | 5.58E-06 |
| 2.89E-05 | 2.17E-05 | 1.62E-05 | 1.22E-05 | 9.09E-06 | 6.85E-06 | 5.14E-06 | 3.85E-06 | 2.89E-06 | 2.17E-06 |
| 1.04E-07 | 7.69E-08 | 5.66E-08 | 4.17E-08 | 3.07E-08 | 2.26E-08 | 1.67E-08 | 1.22E-08 | 9.00E-09 | 6.65E-09 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.47E-09 | 1.82E-09 | 1.34E-09 | 9.90E-10 | 7.28E-10 | 5.37E-10 | 3.96E-10 | 2.92E-10 | 2.15E-10 | 1.58E-10 |
| 4.03E-05 | 3.02E-05 | 2.27E-05 | 1.70E-05 | 1.28E-05 | 9.54E-06 | 7.17E-06 | 5.38E-06 | 4.03E-06 | 3.02E-06 |
| 1.67E-07 | 1.24E-07 | 9.18E-08 | 6.83E-08 | 5.07E-08 | 3.76E-08 | 2.79E-08 | 2.07E-08 | 1.54E-08 | 1.14E-08 |

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|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 7:20     | 7:35     | 7:50     | 8:05     | 8:20     | 8:35     | 8:50     | 9:05     | 9:20     | 9:35     |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.90E-04 | 1.42E-04 | 1.06E-04 | 7.99E-05 | 5.99E-05 | 4.49E-05 | 3.37E-05 | 2.52E-05 | 1.89E-05 | 1.41E-05 |
| 5.31E-06 | 3.98E-06 | 2.99E-06 | 2.24E-06 | 1.68E-06 | 1.26E-06 | 9.45E-07 | 7.07E-07 | 5.31E-07 | 3.98E-07 |
| 3.12E-07 | 2.33E-07 | 1.74E-07 | 1.30E-07 | 9.63E-08 | 7.21E-08 | 5.38E-08 | 4.01E-08 | 3.00E-08 | 2.23E-08 |
| 4.74E-06 | 3.56E-06 | 2.67E-06 | 2.00E-06 | 1.50E-06 | 1.13E-06 | 8.44E-07 | 6.34E-07 | 4.75E-07 | 3.56E-07 |
| 5.94E-08 | 4.46E-08 | 3.34E-08 | 2.51E-08 | 1.88E-08 | 1.41E-08 | 1.06E-08 | 7.93E-09 | 5.95E-09 | 4.46E-09 |
| 2.79E-04 | 2.09E-04 | 1.57E-04 | 1.18E-04 | 8.83E-05 | 6.62E-05 | 4.97E-05 | 3.73E-05 | 2.79E-05 | 2.10E-05 |
| 8.46E-05 | 6.35E-05 | 4.75E-05 | 3.56E-05 | 2.67E-05 | 2.00E-05 | 1.50E-05 | 1.13E-05 | 8.43E-06 | 6.32E-06 |
| 1.94E-04 | 1.46E-04 | 1.09E-04 | 8.18E-05 | 6.13E-05 | 4.60E-05 | 3.45E-05 | 2.59E-05 | 1.94E-05 | 1.46E-05 |
| 1.52E-03 | 1.14E-03 | 8.55E-04 | 6.41E-04 | 4.81E-04 | 3.60E-04 | 2.70E-04 | 2.02E-04 | 1.51E-04 | 1.13E-04 |
| 1.59E-04 | 1.19E-04 | 8.91E-05 | 6.67E-05 | 4.99E-05 | 3.74E-05 | 2.79E-05 | 2.09E-05 | 1.57E-05 | 1.17E-05 |
| 5.18E-05 | 3.85E-05 | 2.86E-05 | 2.13E-05 | 1.58E-05 | 1.18E-05 | 8.77E-06 | 6.52E-06 | 4.85E-06 | 3.61E-06 |
| 2.76E-09 | 2.02E-09 | 1.48E-09 | 1.08E-09 | 7.87E-10 | 5.75E-10 | 4.20E-10 | 3.07E-10 | 2.24E-10 | 1.64E-10 |
| 3.51E-02 | 2.64E-02 | 1.98E-02 | 1.49E-02 | 1.11E-02 | 8.33E-03 | 6.26E-03 | 4.69E-03 | 3.52E-03 | 2.64E-03 |
| 6.94E-10 | 5.01E-10 | 3.62E-10 | 2.61E-10 | 1.88E-10 | 1.36E-10 | 9.81E-11 | 7.07E-11 | 5.10E-11 | 3.68E-11 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.14E-04 | 8.57E-05 | 6.44E-05 | 4.84E-05 | 3.65E-05 | 2.75E-05 | 2.06E-05 | 1.55E-05 | 1.17E-05 | 8.77E-06 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 7.98E-06 | 5.98E-06 | 4.46E-06 | 3.34E-06 | 2.50E-06 | 1.87E-06 | 1.40E-06 | 1.04E-06 | 7.83E-07 | 5.85E-07 |
| 2.44E-06 | 1.83E-06 | 1.37E-06 | 1.03E-06 | 7.70E-07 | 5.78E-07 | 4.34E-07 | 3.25E-07 | 2.44E-07 | 1.83E-07 |
| 4.84E-10 | 3.59E-10 | 2.66E-10 | 1.98E-10 | 1.47E-10 | 1.09E-10 | 8.10E-11 | 6.01E-11 | 4.46E-11 | 3.31E-11 |
| 6.65E-07 | 4.99E-07 | 3.74E-07 | 2.80E-07 | 2.10E-07 | 1.58E-07 | 1.18E-07 | 8.83E-08 | 6.62E-08 | 4.96E-08 |
| 1.46E-05 | 1.09E-05 | 8.13E-06 | 6.08E-06 | 4.55E-06 | 3.40E-06 | 2.54E-06 | 1.90E-06 | 1.42E-06 | 1.06E-06 |
| 3.29E-09 | 2.47E-09 | 1.85E-09 | 1.40E-09 | 1.04E-09 | 7.86E-10 | 5.90E-10 | 4.43E-10 | 3.33E-10 | 2.50E-10 |
| 1.61E-06 | 1.21E-06 | 9.09E-07 | 6.79E-07 | 5.09E-07 | 3.82E-07 | 2.86E-07 | 2.14E-07 | 1.60E-07 | 1.21E-07 |
| 4.74E-06 | 3.56E-06 | 2.67E-06 | 2.00E-06 | 1.50E-06 | 1.13E-06 | 8.44E-07 | 6.34E-07 | 4.75E-07 | 3.56E-07 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.50E-07 | 3.38E-07 | 2.53E-07 | 1.90E-07 | 1.42E-07 | 1.07E-07 | 8.01E-08 | 6.00E-08 | 4.50E-08 | 3.38E-08 |
| 3.29E-06 | 2.47E-06 | 1.85E-06 | 1.39E-06 | 1.04E-06 | 7.79E-07 | 5.84E-07 | 4.37E-07 | 3.29E-07 | 2.46E-07 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.66E-05 | 2.00E-05 | 1.49E-05 | 1.13E-05 | 8.42E-06 | 6.31E-06 | 4.73E-06 | 3.55E-06 | 2.66E-06 | 2.00E-06 |
| 1.51E-06 | 1.13E-06 | 8.41E-07 | 6.27E-07 | 4.68E-07 | 3.49E-07 | 2.61E-07 | 1.94E-07 | 1.45E-07 | 1.09E-07 |
| 2.66E-05 | 2.00E-05 | 1.50E-05 | 1.13E-05 | 8.43E-06 | 6.33E-06 | 4.74E-06 | 3.56E-06 | 2.66E-06 | 2.00E-06 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 8.10E-06 | 6.08E-06 | 4.55E-06 | 3.42E-06 | 2.57E-06 | 1.93E-06 | 1.44E-06 | 1.08E-06 | 8.11E-07 | 6.08E-07 |
| 1.17E-05 | 8.73E-06 | 6.53E-06 | 4.90E-06 | 3.66E-06 | 2.75E-06 | 2.05E-06 | 1.54E-06 | 1.15E-06 | 8.61E-07 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.22E-04 | 9.09E-05 | 6.81E-05 | 5.11E-05 | 3.83E-05 | 2.87E-05 | 2.15E-05 | 1.62E-05 | 1.22E-05 | 9.09E-06 |
| 1.01E-05 | 7.58E-06 | 5.68E-06 | 4.26E-06 | 3.20E-06 | 2.39E-06 | 1.80E-06 | 1.35E-06 | 1.01E-06 | 7.58E-07 |
| 7.73E-09 | 5.70E-09 | 4.19E-09 | 3.09E-09 | 2.28E-09 | 1.67E-09 | 1.23E-09 | 9.09E-10 | 6.69E-10 | 4.92E-10 |

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 7.70E-06 | 5.76E-06 | 4.30E-06 | 3.22E-06 | 2.41E-06 | 1.80E-06 | 1.35E-06 | 1.01E-06 | 7.54E-07 | 5.64E-07 |
| 1.82E-05 | 1.36E-05 | 1.02E-05 | 7.64E-06 | 5.72E-06 | 4.28E-06 | 3.21E-06 | 2.40E-06 | 1.80E-06 | 1.35E-06 |
| 5.33E-06 | 4.00E-06 | 3.00E-06 | 2.25E-06 | 1.68E-06 | 1.27E-06 | 9.45E-07 | 7.11E-07 | 5.34E-07 | 4.01E-07 |
| 1.33E-05 | 9.99E-06 | 7.48E-06 | 5.61E-06 | 4.20E-06 | 3.15E-06 | 2.37E-06 | 1.77E-06 | 1.33E-06 | 9.99E-07 |
| 2.04E-05 | 1.53E-05 | 1.15E-05 | 8.61E-06 | 6.46E-06 | 4.84E-06 | 3.64E-06 | 2.73E-06 | 2.04E-06 | 1.53E-06 |
| 7.06E-07 | 5.27E-07 | 3.92E-07 | 2.93E-07 | 2.18E-07 | 1.63E-07 | 1.22E-07 | 9.00E-08 | 6.74E-08 | 5.03E-08 |
| 3.13E-06 | 2.34E-06 | 1.75E-06 | 1.30E-06 | 9.72E-07 | 7.23E-07 | 5.39E-07 | 4.01E-07 | 3.00E-07 | 2.23E-07 |
| 1.55E-04 | 1.15E-04 | 8.65E-05 | 6.47E-05 | 4.84E-05 | 3.63E-05 | 2.71E-05 | 2.03E-05 | 1.52E-05 | 1.13E-05 |
| 4.27E-02 | 3.20E-02 | 2.39E-02 | 1.79E-02 | 1.34E-02 | 1.01E-02 | 7.56E-03 | 5.66E-03 | 4.25E-03 | 3.19E-03 |
| 4.23E+00 | 3.17E+00 | 2.38E+00 | 1.77E+00 | 1.33E+00 | 9.99E-01 | 7.46E-01 | 5.59E-01 | 4.19E-01 | 3.13E-01 |
| 4.62E-02 | 3.46E-02 | 2.58E-02 | 1.93E-02 | 1.44E-02 | 1.08E-02 | 8.06E-03 | 6.03E-03 | 4.51E-03 | 3.37E-03 |
| 5.97E-04 | 4.39E-04 | 3.23E-04 | 2.38E-04 | 1.75E-04 | 1.29E-04 | 9.45E-05 | 6.98E-05 | 5.13E-05 | 3.77E-05 |
| 4.43E-10 | 3.23E-10 | 2.37E-10 | 1.73E-10 | 1.26E-10 | 9.18E-11 | 6.73E-11 | 4.91E-11 | 3.59E-11 | 0.00E+00 |
| 4.20E-06 | 3.17E-06 | 2.39E-06 | 1.79E-06 | 1.35E-06 | 1.02E-06 | 7.65E-07 | 5.76E-07 | 4.33E-07 | 3.26E-07 |
| 1.62E-06 | 1.22E-06 | 9.09E-07 | 6.85E-07 | 5.14E-07 | 3.85E-07 | 2.89E-07 | 2.17E-07 | 1.62E-07 | 1.22E-07 |
| 4.90E-09 | 3.61E-09 | 2.66E-09 | 1.95E-09 | 1.44E-09 | 1.06E-09 | 7.81E-10 | 5.75E-10 | 4.24E-10 | 3.12E-10 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.17E-10 | 8.62E-11 | 6.35E-11 | 4.69E-11 | 3.46E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.27E-06 | 1.70E-06 | 1.28E-06 | 9.54E-07 | 7.18E-07 | 5.38E-07 | 4.04E-07 | 3.02E-07 | 2.27E-07 | 1.70E-07 |
| 8.48E-09 | 6.30E-09 | 4.67E-09 | 3.47E-09 | 2.57E-09 | 1.91E-09 | 1.42E-09 | 1.05E-09 | 7.82E-10 | 5.81E-10 |

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|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 9:50     | 10:05    | 10:20    | 10:35    | 10:50    | 11:05    | 11:20    | 11:35    | 11:50    | 12:05    |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.06E-05 | 7.97E-06 | 5.97E-06 | 4.47E-06 | 3.36E-06 | 2.51E-06 | 1.88E-06 | 1.41E-06 | 1.06E-06 | 7.94E-07 |
| 2.99E-07 | 2.24E-07 | 1.67E-07 | 1.26E-07 | 9.45E-08 | 7.07E-08 | 5.30E-08 | 3.98E-08 | 2.98E-08 | 2.23E-08 |
| 1.67E-08 | 1.24E-08 | 9.27E-09 | 6.92E-09 | 5.17E-09 | 3.85E-09 | 2.87E-09 | 2.14E-09 | 1.60E-09 | 1.20E-09 |
| 2.67E-07 | 2.01E-07 | 1.50E-07 | 1.13E-07 | 8.45E-08 | 6.34E-08 | 4.75E-08 | 3.56E-08 | 2.67E-08 | 2.01E-08 |
| 3.35E-09 | 2.51E-09 | 1.88E-09 | 1.41E-09 | 1.06E-09 | 7.94E-10 | 5.95E-10 | 4.46E-10 | 3.35E-10 | 2.51E-10 |
| 1.58E-05 | 1.18E-05 | 8.84E-06 | 6.62E-06 | 4.97E-06 | 3.73E-06 | 2.80E-06 | 2.10E-06 | 1.58E-06 | 1.18E-06 |
| 4.74E-06 | 3.56E-06 | 2.66E-06 | 2.00E-06 | 1.49E-06 | 1.13E-06 | 8.41E-07 | 6.30E-07 | 4.73E-07 | 3.54E-07 |
| 1.09E-05 | 8.19E-06 | 6.14E-06 | 4.61E-06 | 3.46E-06 | 2.59E-06 | 1.94E-06 | 1.46E-06 | 1.09E-06 | 8.20E-07 |
| 8.50E-05 | 6.37E-05 | 4.77E-05 | 3.57E-05 | 2.68E-05 | 2.01E-05 | 1.50E-05 | 1.13E-05 | 8.45E-06 | 6.33E-06 |
| 8.77E-06 | 6.56E-06 | 4.91E-06 | 3.67E-06 | 2.75E-06 | 2.06E-06 | 1.54E-06 | 1.15E-06 | 8.62E-07 | 6.45E-07 |
| 2.68E-06 | 2.00E-06 | 1.49E-06 | 1.11E-06 | 8.21E-07 | 6.11E-07 | 4.55E-07 | 3.38E-07 | 2.51E-07 | 1.87E-07 |
| 1.20E-10 | 8.74E-11 | 6.38E-11 | 4.66E-11 | 3.41E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.98E-03 | 1.49E-03 | 1.12E-03 | 8.34E-04 | 6.26E-04 | 4.70E-04 | 3.52E-04 | 2.64E-04 | 1.98E-04 | 1.49E-04 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 6.59E-06 | 4.96E-06 | 3.73E-06 | 2.80E-06 | 2.11E-06 | 1.58E-06 | 1.19E-06 | 8.96E-07 | 6.73E-07 | 5.07E-07 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.38E-07 | 3.28E-07 | 2.45E-07 | 1.84E-07 | 1.37E-07 | 1.03E-07 | 7.67E-08 | 5.74E-08 | 4.29E-08 | 3.21E-08 |
| 1.37E-07 | 1.03E-07 | 7.71E-08 | 5.79E-08 | 4.34E-08 | 3.25E-08 | 2.44E-08 | 1.83E-08 | 1.37E-08 | 1.03E-08 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.72E-08 | 2.79E-08 | 2.09E-08 | 1.57E-08 | 1.17E-08 | 8.79E-09 | 6.60E-09 | 4.94E-09 | 3.70E-09 | 2.77E-09 |
| 7.94E-07 | 5.94E-07 | 4.44E-07 | 3.32E-07 | 2.48E-07 | 1.85E-07 | 1.39E-07 | 1.04E-07 | 7.76E-08 | 5.81E-08 |
| 1.88E-10 | 1.41E-10 | 1.06E-10 | 7.96E-11 | 5.98E-11 | 4.49E-11 | 3.38E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 9.00E-08 | 6.77E-08 | 5.07E-08 | 3.80E-08 | 2.85E-08 | 2.13E-08 | 1.60E-08 | 1.20E-08 | 8.99E-09 | 6.74E-09 |
| 2.67E-07 | 2.01E-07 | 1.50E-07 | 1.13E-07 | 8.45E-08 | 6.34E-08 | 4.75E-08 | 3.56E-08 | 2.67E-08 | 2.01E-08 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.53E-08 | 1.90E-08 | 1.42E-08 | 1.07E-08 | 8.02E-09 | 6.01E-09 | 4.51E-09 | 3.38E-09 | 2.54E-09 | 1.90E-09 |
| 1.85E-07 | 1.39E-07 | 1.04E-07 | 7.77E-08 | 5.82E-08 | 4.37E-08 | 3.28E-08 | 2.46E-08 | 1.85E-08 | 1.38E-08 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.49E-06 | 1.13E-06 | 8.42E-07 | 6.31E-07 | 4.73E-07 | 3.55E-07 | 2.66E-07 | 2.00E-07 | 1.49E-07 | 1.13E-07 |
| 8.09E-08 | 6.04E-08 | 4.51E-08 | 3.37E-08 | 2.51E-08 | 1.87E-08 | 1.40E-08 | 1.04E-08 | 7.79E-09 | 5.81E-09 |
| 1.50E-06 | 1.13E-06 | 8.43E-07 | 6.33E-07 | 4.74E-07 | 3.56E-07 | 2.66E-07 | 2.00E-07 | 1.50E-07 | 1.13E-07 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.56E-07 | 3.42E-07 | 2.57E-07 | 1.93E-07 | 1.44E-07 | 1.08E-07 | 8.12E-08 | 6.08E-08 | 4.56E-08 | 3.43E-08 |
| 6.44E-07 | 4.82E-07 | 3.61E-07 | 2.70E-07 | 2.03E-07 | 1.51E-07 | 1.13E-07 | 8.49E-08 | 6.35E-08 | 4.76E-08 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 6.81E-06 | 5.11E-06 | 3.83E-06 | 2.87E-06 | 2.15E-06 | 1.62E-06 | 1.22E-06 | 9.09E-07 | 6.81E-07 | 5.11E-07 |
| 5.69E-07 | 4.27E-07 | 3.20E-07 | 2.40E-07 | 1.80E-07 | 1.35E-07 | 1.01E-07 | 7.59E-08 | 5.70E-08 | 4.27E-08 |
| 3.63E-10 | 2.67E-10 | 1.97E-10 | 1.45E-10 | 1.07E-10 | 7.86E-11 | 5.79E-11 | 4.27E-11 | 3.14E-11 | 0.00E+00 |

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 4.22E-07 | 3.16E-07 | 2.36E-07 | 1.76E-07 | 1.32E-07 | 9.90E-08 | 7.40E-08 | 5.54E-08 | 4.14E-08 | 3.10E-08 |
| 1.01E-06 | 7.57E-07 | 5.67E-07 | 4.25E-07 | 3.18E-07 | 2.39E-07 | 1.78E-07 | 1.33E-07 | 9.99E-08 | 7.50E-08 |
| 3.00E-07 | 2.25E-07 | 1.69E-07 | 1.27E-07 | 9.45E-08 | 7.12E-08 | 5.34E-08 | 4.01E-08 | 3.01E-08 | 2.25E-08 |
| 7.47E-07 | 5.61E-07 | 4.20E-07 | 3.15E-07 | 2.37E-07 | 1.77E-07 | 1.33E-07 | 9.99E-08 | 7.47E-08 | 5.60E-08 |
| 1.15E-06 | 8.61E-07 | 6.45E-07 | 4.84E-07 | 3.63E-07 | 2.72E-07 | 2.04E-07 | 1.53E-07 | 1.14E-07 | 8.60E-08 |
| 3.75E-08 | 2.80E-08 | 2.09E-08 | 1.56E-08 | 1.16E-08 | 8.65E-09 | 6.44E-09 | 4.81E-09 | 3.58E-09 | 2.67E-09 |
| 1.67E-07 | 1.24E-07 | 9.27E-08 | 6.90E-08 | 5.15E-08 | 3.84E-08 | 2.86E-08 | 2.13E-08 | 1.59E-08 | 1.19E-08 |
| 8.51E-06 | 6.36E-06 | 4.76E-06 | 3.56E-06 | 2.66E-06 | 2.00E-06 | 1.49E-06 | 1.12E-06 | 8.37E-07 | 6.26E-07 |
| 2.39E-03 | 1.79E-03 | 1.34E-03 | 1.01E-03 | 7.53E-04 | 5.64E-04 | 4.23E-04 | 3.17E-04 | 2.38E-04 | 1.78E-04 |
| 2.35E-01 | 1.76E-01 | 1.31E-01 | 9.90E-02 | 7.39E-02 | 5.54E-02 | 4.15E-02 | 3.11E-02 | 2.32E-02 | 1.75E-02 |
| 2.52E-03 | 1.88E-03 | 1.40E-03 | 1.05E-03 | 7.86E-04 | 5.88E-04 | 4.39E-04 | 3.29E-04 | 2.46E-04 | 1.84E-04 |
| 2.78E-05 | 2.04E-05 | 1.50E-05 | 1.11E-05 | 8.15E-06 | 5.99E-06 | 4.41E-06 | 3.25E-06 | 2.39E-06 | 1.76E-06 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.46E-07 | 1.85E-07 | 1.40E-07 | 1.04E-07 | 7.88E-08 | 5.93E-08 | 4.46E-08 | 3.36E-08 | 2.53E-08 | 1.90E-08 |
| 9.09E-08 | 6.85E-08 | 5.14E-08 | 3.85E-08 | 2.89E-08 | 2.17E-08 | 1.63E-08 | 1.22E-08 | 9.18E-09 | 6.85E-09 |
| 2.30E-10 | 1.69E-10 | 1.24E-10 | 9.18E-11 | 6.76E-11 | 4.98E-11 | 3.66E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.28E-07 | 9.54E-08 | 7.18E-08 | 5.38E-08 | 4.04E-08 | 3.02E-08 | 2.27E-08 | 1.70E-08 | 1.28E-08 | 9.54E-09 |
| 4.31E-10 | 3.20E-10 | 2.38E-10 | 1.76E-10 | 1.31E-10 | 9.72E-11 | 7.22E-11 | 5.36E-11 | 3.98E-11 | 2.95E-11 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 12:20    | 12:35    | 12:50    | 13:05    | 13:20    | 13:35    | 13:50    | 14:05    | 14:20    | 14:35    |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 5.95E-07 | 4.46E-07 | 3.34E-07 | 2.50E-07 | 1.88E-07 | 1.40E-07 | 1.05E-07 | 7.91E-08 | 5.93E-08 | 4.45E-08 |          |
| 1.67E-08 | 1.26E-08 | 9.45E-09 | 7.07E-09 | 5.30E-09 | 3.98E-09 | 2.98E-09 | 2.23E-09 | 1.67E-09 | 1.26E-09 |          |
| 8.91E-10 | 6.65E-10 | 4.96E-10 | 3.70E-10 | 2.76E-10 | 2.06E-10 | 1.54E-10 | 1.14E-10 | 8.55E-11 | 6.38E-11 |          |
| 1.50E-08 | 1.13E-08 | 8.46E-09 | 6.35E-09 | 4.76E-09 | 3.56E-09 | 2.67E-09 | 2.01E-09 | 1.50E-09 | 1.13E-09 |          |
| 1.88E-10 | 1.41E-10 | 1.06E-10 | 7.95E-11 | 5.96E-11 | 4.46E-11 | 3.35E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 8.85E-07 | 6.63E-07 | 4.98E-07 | 3.74E-07 | 2.80E-07 | 2.10E-07 | 1.58E-07 | 1.18E-07 | 8.86E-08 | 6.64E-08 |          |
| 2.66E-07 | 1.99E-07 | 1.49E-07 | 1.12E-07 | 8.38E-08 | 6.28E-08 | 4.71E-08 | 3.53E-08 | 2.65E-08 | 1.98E-08 |          |
| 6.15E-07 | 4.61E-07 | 3.46E-07 | 2.59E-07 | 1.94E-07 | 1.46E-07 | 1.10E-07 | 8.21E-08 | 6.16E-08 | 4.62E-08 |          |
| 4.74E-06 | 3.56E-06 | 2.66E-06 | 2.00E-06 | 1.49E-06 | 1.13E-06 | 8.40E-07 | 6.29E-07 | 4.72E-07 | 3.54E-07 |          |
| 4.82E-07 | 3.61E-07 | 2.70E-07 | 2.03E-07 | 1.51E-07 | 1.13E-07 | 8.48E-08 | 6.35E-08 | 4.75E-08 | 3.56E-08 |          |
| 1.39E-07 | 1.04E-07 | 7.69E-08 | 5.72E-08 | 4.26E-08 | 3.17E-08 | 2.35E-08 | 1.75E-08 | 1.31E-08 | 9.72E-09 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 1.12E-04 | 8.35E-05 | 6.26E-05 | 4.70E-05 | 3.53E-05 | 2.65E-05 | 1.98E-05 | 1.49E-05 | 1.12E-05 | 8.36E-06 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 3.81E-07 | 2.86E-07 | 2.15E-07 | 1.62E-07 | 1.22E-07 | 9.18E-08 | 6.88E-08 | 5.17E-08 | 3.88E-08 | 2.92E-08 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 2.40E-08 | 1.80E-08 | 1.34E-08 | 1.01E-08 | 7.52E-09 | 5.63E-09 | 4.21E-09 | 3.15E-09 | 2.36E-09 | 1.76E-09 |          |
| 7.72E-09 | 5.79E-09 | 4.34E-09 | 3.26E-09 | 2.44E-09 | 1.84E-09 | 1.38E-09 | 1.03E-09 | 7.73E-10 | 5.80E-10 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 2.08E-09 | 1.56E-09 | 1.17E-09 | 8.76E-10 | 6.56E-10 | 4.92E-10 | 3.69E-10 | 2.76E-10 | 2.07E-10 | 1.56E-10 |          |
| 4.34E-08 | 3.24E-08 | 2.42E-08 | 1.81E-08 | 1.36E-08 | 1.02E-08 | 7.58E-09 | 5.67E-09 | 4.24E-09 | 3.17E-09 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 5.06E-09 | 3.79E-09 | 2.84E-09 | 2.13E-09 | 1.59E-09 | 1.20E-09 | 8.96E-10 | 6.72E-10 | 5.04E-10 | 3.78E-10 |          |
| 1.50E-08 | 1.13E-08 | 8.46E-09 | 6.35E-09 | 4.76E-09 | 3.57E-09 | 2.67E-09 | 2.01E-09 | 1.50E-09 | 1.13E-09 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 1.42E-09 | 1.07E-09 | 8.03E-10 | 6.02E-10 | 4.51E-10 | 3.38E-10 | 2.54E-10 | 1.91E-10 | 1.43E-10 | 1.07E-10 |          |
| 1.04E-08 | 7.76E-09 | 5.81E-09 | 4.36E-09 | 3.27E-09 | 2.45E-09 | 1.84E-09 | 1.38E-09 | 1.04E-09 | 7.74E-10 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 8.42E-08 | 6.31E-08 | 4.73E-08 | 3.55E-08 | 2.66E-08 | 2.00E-08 | 1.49E-08 | 1.13E-08 | 8.41E-09 | 6.31E-09 |          |
| 4.34E-09 | 3.24E-09 | 2.42E-09 | 1.80E-09 | 1.35E-09 | 1.01E-09 | 7.50E-10 | 5.60E-10 | 4.18E-10 | 3.11E-10 |          |
| 8.43E-08 | 6.32E-08 | 4.74E-08 | 3.56E-08 | 2.66E-08 | 2.00E-08 | 1.49E-08 | 1.13E-08 | 8.42E-09 | 6.32E-09 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 2.57E-08 | 1.93E-08 | 1.45E-08 | 1.08E-08 | 8.13E-09 | 6.09E-09 | 4.57E-09 | 3.43E-09 | 2.57E-09 | 1.93E-09 |          |
| 3.56E-08 | 2.66E-08 | 2.00E-08 | 1.49E-08 | 1.12E-08 | 8.37E-09 | 6.26E-09 | 4.69E-09 | 3.51E-09 | 2.63E-09 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |
| 3.83E-07 | 2.87E-07 | 2.15E-07 | 1.62E-07 | 1.22E-07 | 9.09E-08 | 6.81E-08 | 5.11E-08 | 3.83E-08 | 2.87E-08 |          |
| 3.20E-08 | 2.40E-08 | 1.80E-08 | 1.35E-08 | 1.02E-08 | 7.60E-09 | 5.70E-09 | 4.28E-09 | 3.20E-09 | 2.40E-09 |          |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |          |

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 2.31E-08 | 1.73E-08 | 1.30E-08 | 9.72E-09 | 7.25E-09 | 5.43E-09 | 4.06E-09 | 3.03E-09 | 2.27E-09 | 1.70E-09 |
| 5.62E-08 | 4.20E-08 | 3.15E-08 | 2.36E-08 | 1.76E-08 | 1.32E-08 | 9.90E-09 | 7.43E-09 | 5.56E-09 | 4.17E-09 |
| 1.69E-08 | 1.27E-08 | 9.54E-09 | 7.13E-09 | 5.35E-09 | 4.01E-09 | 3.01E-09 | 2.25E-09 | 1.69E-09 | 1.27E-09 |
| 4.20E-08 | 3.15E-08 | 2.36E-08 | 1.77E-08 | 1.33E-08 | 9.99E-09 | 7.46E-09 | 5.60E-09 | 4.19E-09 | 3.15E-09 |
| 6.45E-08 | 4.84E-08 | 3.63E-08 | 2.72E-08 | 2.04E-08 | 1.53E-08 | 1.14E-08 | 8.60E-09 | 6.44E-09 | 4.83E-09 |
| 1.99E-09 | 1.49E-09 | 1.11E-09 | 8.26E-10 | 6.17E-10 | 4.60E-10 | 3.43E-10 | 2.56E-10 | 1.91E-10 | 1.42E-10 |
| 8.86E-09 | 6.61E-09 | 4.92E-09 | 3.67E-09 | 2.74E-09 | 2.04E-09 | 1.52E-09 | 1.13E-09 | 8.46E-10 | 6.31E-10 |
| 4.69E-07 | 3.51E-07 | 2.63E-07 | 1.96E-07 | 1.47E-07 | 1.10E-07 | 8.23E-08 | 6.16E-08 | 4.61E-08 | 3.45E-08 |
| 1.33E-04 | 9.99E-05 | 7.51E-05 | 5.63E-05 | 4.21E-05 | 3.16E-05 | 2.37E-05 | 1.77E-05 | 1.33E-05 | 9.99E-06 |
| 1.31E-02 | 9.81E-03 | 7.32E-03 | 5.48E-03 | 4.10E-03 | 3.08E-03 | 2.30E-03 | 1.73E-03 | 1.30E-03 | 9.72E-04 |
| 1.37E-04 | 1.03E-04 | 7.67E-05 | 5.73E-05 | 4.28E-05 | 3.20E-05 | 2.39E-05 | 1.79E-05 | 1.34E-05 | 9.99E-06 |
| 1.30E-06 | 9.54E-07 | 7.00E-07 | 5.15E-07 | 3.79E-07 | 2.79E-07 | 2.05E-07 | 1.51E-07 | 1.11E-07 | 8.18E-08 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.43E-08 | 1.08E-08 | 8.10E-09 | 6.10E-09 | 4.59E-09 | 3.46E-09 | 2.60E-09 | 1.95E-09 | 1.47E-09 | 1.11E-09 |
| 5.14E-09 | 3.85E-09 | 2.89E-09 | 2.17E-09 | 1.63E-09 | 1.22E-09 | 9.18E-10 | 6.85E-10 | 5.14E-10 | 3.85E-10 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 7.18E-09 | 5.38E-09 | 4.04E-09 | 3.02E-09 | 2.27E-09 | 1.70E-09 | 1.28E-09 | 9.54E-10 | 7.18E-10 | 5.38E-10 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 14:50    | 15:05    | 15:20    | 15:35    | 15:50    | 16:05    | 16:20    | 16:35    | 16:50    | 17:05    |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.33E-08 | 2.49E-08 | 1.87E-08 | 1.40E-08 | 1.05E-08 | 7.88E-09 | 5.90E-09 | 4.43E-09 | 3.32E-09 | 2.48E-09 |
| 9.45E-10 | 7.07E-10 | 5.30E-10 | 3.97E-10 | 2.98E-10 | 2.23E-10 | 1.67E-10 | 1.26E-10 | 9.45E-11 | 7.06E-11 |
| 4.76E-11 | 3.56E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 8.47E-10 | 6.35E-10 | 4.76E-10 | 3.57E-10 | 2.68E-10 | 2.01E-10 | 1.50E-10 | 1.13E-10 | 8.48E-11 | 6.35E-11 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.98E-08 | 3.74E-08 | 2.80E-08 | 2.10E-08 | 1.58E-08 | 1.18E-08 | 8.87E-09 | 6.65E-09 | 4.99E-09 | 3.74E-09 |
| 1.49E-08 | 1.12E-08 | 8.35E-09 | 6.26E-09 | 4.69E-09 | 3.52E-09 | 2.64E-09 | 1.98E-09 | 1.49E-09 | 1.11E-09 |
| 3.47E-08 | 2.59E-08 | 1.94E-08 | 1.46E-08 | 1.10E-08 | 8.22E-09 | 6.17E-09 | 4.62E-09 | 3.47E-09 | 2.60E-09 |
| 2.65E-07 | 1.98E-07 | 1.49E-07 | 1.12E-07 | 8.34E-08 | 6.26E-08 | 4.69E-08 | 3.51E-08 | 2.63E-08 | 1.97E-08 |
| 2.66E-08 | 1.99E-08 | 1.49E-08 | 1.12E-08 | 8.33E-09 | 6.24E-09 | 4.67E-09 | 3.49E-09 | 2.62E-09 | 1.95E-09 |
| 7.20E-09 | 5.36E-09 | 3.99E-09 | 2.96E-09 | 2.21E-09 | 1.64E-09 | 1.22E-09 | 9.09E-10 | 6.75E-10 | 5.01E-10 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 6.27E-06 | 4.71E-06 | 3.53E-06 | 2.65E-06 | 1.98E-06 | 1.49E-06 | 1.12E-06 | 8.37E-07 | 6.28E-07 | 4.71E-07 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.20E-08 | 1.65E-08 | 1.24E-08 | 9.36E-09 | 7.00E-09 | 5.27E-09 | 3.96E-09 | 2.97E-09 | 2.23E-09 | 1.68E-09 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.31E-09 | 9.90E-10 | 7.37E-10 | 5.52E-10 | 4.12E-10 | 3.09E-10 | 2.31E-10 | 1.73E-10 | 1.30E-10 | 9.63E-11 |
| 4.35E-10 | 3.26E-10 | 2.45E-10 | 1.84E-10 | 1.38E-10 | 1.04E-10 | 7.74E-11 | 5.81E-11 | 4.35E-11 | 3.27E-11 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.16E-10 | 8.72E-11 | 6.53E-11 | 4.91E-11 | 3.67E-11 | 2.75E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.37E-09 | 1.77E-09 | 1.32E-09 | 9.90E-10 | 7.41E-10 | 5.54E-10 | 4.14E-10 | 3.10E-10 | 2.31E-10 | 1.73E-10 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.84E-10 | 2.12E-10 | 1.59E-10 | 1.20E-10 | 8.94E-11 | 6.71E-11 | 5.02E-11 | 3.76E-11 | 2.83E-11 | 0.00E+00 |
| 8.47E-10 | 6.35E-10 | 4.76E-10 | 3.57E-10 | 2.68E-10 | 2.01E-10 | 1.50E-10 | 1.13E-10 | 8.48E-11 | 6.35E-11 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 8.04E-11 | 6.02E-11 | 4.52E-11 | 3.39E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 5.81E-10 | 4.35E-10 | 3.26E-10 | 2.45E-10 | 1.84E-10 | 1.38E-10 | 1.04E-10 | 7.72E-11 | 5.80E-11 | 4.34E-11 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.73E-09 | 3.55E-09 | 2.66E-09 | 2.00E-09 | 1.49E-09 | 1.13E-09 | 8.41E-10 | 6.30E-10 | 4.73E-10 | 3.55E-10 |
| 2.33E-10 | 1.74E-10 | 1.30E-10 | 9.63E-11 | 7.22E-11 | 5.39E-11 | 4.02E-11 | 3.00E-11 | 0.00E+00 | 0.00E+00 |
| 4.73E-09 | 3.56E-09 | 2.66E-09 | 2.00E-09 | 1.49E-09 | 1.13E-09 | 8.42E-10 | 6.32E-10 | 4.73E-10 | 3.56E-10 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.45E-09 | 1.09E-09 | 8.14E-10 | 6.10E-10 | 4.57E-10 | 3.43E-10 | 2.57E-10 | 1.93E-10 | 1.45E-10 | 1.09E-10 |
| 1.97E-09 | 1.48E-09 | 1.11E-09 | 8.26E-10 | 6.18E-10 | 4.63E-10 | 3.47E-10 | 2.59E-10 | 1.94E-10 | 1.45E-10 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.15E-08 | 1.62E-08 | 1.22E-08 | 9.09E-09 | 6.81E-09 | 5.11E-09 | 3.83E-09 | 2.87E-09 | 2.15E-09 | 1.62E-09 |
| 1.80E-09 | 1.35E-09 | 1.02E-09 | 7.61E-10 | 5.71E-10 | 4.28E-10 | 3.21E-10 | 2.40E-10 | 1.81E-10 | 1.35E-10 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |



|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1.27E-09 | 9.54E-10 | 7.11E-10 | 5.32E-10 | 3.98E-10 | 2.98E-10 | 2.22E-10 | 1.67E-10 | 1.24E-10 | 9.27E-11 |
| 3.12E-09 | 2.34E-09 | 1.75E-09 | 1.31E-09 | 9.81E-10 | 7.35E-10 | 5.51E-10 | 4.12E-10 | 3.09E-10 | 2.31E-10 |
| 9.54E-10 | 7.13E-10 | 5.35E-10 | 4.01E-10 | 3.01E-10 | 2.26E-10 | 1.69E-10 | 1.27E-10 | 9.54E-11 | 7.14E-11 |
| 2.36E-09 | 1.77E-09 | 1.32E-09 | 9.99E-10 | 7.46E-10 | 5.60E-10 | 4.19E-10 | 3.14E-10 | 2.36E-10 | 1.76E-10 |
| 3.63E-09 | 2.72E-09 | 2.03E-09 | 1.53E-09 | 1.14E-09 | 8.60E-10 | 6.44E-10 | 4.83E-10 | 3.63E-10 | 2.72E-10 |
| 1.06E-10 | 7.90E-11 | 5.90E-11 | 4.39E-11 | 3.28E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.71E-10 | 3.51E-10 | 2.62E-10 | 1.95E-10 | 1.46E-10 | 1.09E-10 | 8.09E-11 | 6.03E-11 | 4.50E-11 | 3.36E-11 |
| 2.58E-08 | 1.94E-08 | 1.45E-08 | 1.08E-08 | 8.09E-09 | 6.06E-09 | 4.54E-09 | 3.39E-09 | 2.54E-09 | 1.90E-09 |
| 7.47E-06 | 5.60E-06 | 4.20E-06 | 3.15E-06 | 2.36E-06 | 1.76E-06 | 1.32E-06 | 9.90E-07 | 7.44E-07 | 5.58E-07 |
| 7.25E-04 | 5.43E-04 | 4.07E-04 | 3.04E-04 | 2.28E-04 | 1.71E-04 | 1.28E-04 | 9.54E-05 | 7.18E-05 | 5.37E-05 |
| 7.47E-06 | 5.59E-06 | 4.18E-06 | 3.12E-06 | 2.33E-06 | 1.75E-06 | 1.31E-06 | 9.72E-07 | 7.29E-07 | 5.45E-07 |
| 6.02E-08 | 4.43E-08 | 3.26E-08 | 2.39E-08 | 1.76E-08 | 1.30E-08 | 9.54E-09 | 7.03E-09 | 5.18E-09 | 3.81E-09 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 8.33E-10 | 6.26E-10 | 4.72E-10 | 3.55E-10 | 2.66E-10 | 2.01E-10 | 1.51E-10 | 1.13E-10 | 8.54E-11 | 6.43E-11 |
| 2.89E-10 | 2.17E-10 | 1.63E-10 | 1.22E-10 | 9.18E-11 | 6.85E-11 | 5.14E-11 | 3.85E-11 | 2.89E-11 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.04E-10 | 3.03E-10 | 2.27E-10 | 1.70E-10 | 1.28E-10 | 9.54E-11 | 7.18E-11 | 5.39E-11 | 4.04E-11 | 3.03E-11 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|
| 17:20    | 17:35    | 17:50    | 18:05    | 18:20    | 18:35    | 18:50    |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.86E-09 | 1.40E-09 | 1.04E-09 | 7.86E-10 | 5.89E-10 | 4.41E-10 | 3.31E-10 |
| 5.29E-11 | 3.97E-11 | 2.98E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.77E-11 | 3.57E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.81E-09 | 2.11E-09 | 1.58E-09 | 1.18E-09 | 8.87E-10 | 6.65E-10 | 5.00E-10 |
| 8.33E-10 | 6.24E-10 | 4.68E-10 | 3.51E-10 | 2.63E-10 | 1.97E-10 | 1.48E-10 |
| 1.95E-09 | 1.46E-09 | 1.10E-09 | 8.23E-10 | 6.17E-10 | 4.63E-10 | 3.47E-10 |
| 1.48E-08 | 1.11E-08 | 8.30E-09 | 6.22E-09 | 4.66E-09 | 3.49E-09 | 2.62E-09 |
| 1.47E-09 | 1.10E-09 | 8.20E-10 | 6.14E-10 | 4.59E-10 | 3.44E-10 | 2.57E-10 |
| 3.74E-10 | 2.77E-10 | 2.06E-10 | 1.54E-10 | 1.14E-10 | 8.50E-11 | 6.32E-11 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.53E-07 | 2.65E-07 | 1.99E-07 | 1.49E-07 | 1.12E-07 | 8.38E-08 | 6.28E-08 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.26E-09 | 9.45E-10 | 7.13E-10 | 5.36E-10 | 4.02E-10 | 3.02E-10 | 2.28E-10 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 7.23E-11 | 5.41E-11 | 4.04E-11 | 3.02E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.30E-10 | 9.63E-11 | 7.24E-11 | 5.41E-11 | 4.04E-11 | 3.02E-11 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.77E-11 | 3.57E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.26E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.66E-10 | 1.99E-10 | 1.49E-10 | 1.13E-10 | 8.41E-11 | 6.30E-11 | 4.73E-11 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.66E-10 | 2.00E-10 | 1.49E-10 | 1.13E-10 | 8.42E-11 | 6.32E-11 | 4.73E-11 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 8.15E-11 | 6.10E-11 | 4.58E-11 | 3.44E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.09E-10 | 8.15E-11 | 6.09E-11 | 4.56E-11 | 3.42E-11 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.22E-09 | 9.09E-10 | 6.81E-10 | 5.11E-10 | 3.83E-10 | 2.87E-10 | 2.15E-10 |
| 1.02E-10 | 7.61E-11 | 5.72E-11 | 4.28E-11 | 3.21E-11 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

|          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|
| 6.97E-11 | 5.21E-11 | 3.90E-11 | 2.92E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.74E-10 | 1.30E-10 | 9.72E-11 | 7.29E-11 | 5.45E-11 | 4.09E-11 | 3.06E-11 |
| 5.36E-11 | 4.01E-11 | 3.01E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.32E-10 | 9.90E-11 | 7.45E-11 | 5.59E-11 | 4.19E-11 | 3.14E-11 | 0.00E+00 |
| 2.03E-10 | 1.53E-10 | 1.14E-10 | 8.59E-11 | 6.44E-11 | 4.83E-11 | 3.62E-11 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.42E-09 | 1.06E-09 | 7.96E-10 | 5.96E-10 | 4.46E-10 | 3.34E-10 | 2.49E-10 |
| 4.19E-07 | 3.13E-07 | 2.35E-07 | 1.76E-07 | 1.32E-07 | 9.90E-08 | 7.42E-08 |
| 4.02E-05 | 3.02E-05 | 2.26E-05 | 1.69E-05 | 1.27E-05 | 9.45E-06 | 7.11E-06 |
| 4.07E-07 | 3.04E-07 | 2.28E-07 | 1.70E-07 | 1.27E-07 | 9.54E-08 | 7.11E-08 |
| 2.80E-09 | 2.06E-09 | 1.52E-09 | 1.12E-09 | 8.21E-10 | 6.04E-10 | 4.45E-10 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.83E-11 | 3.64E-11 | 2.74E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

## Case Summary

**Event Type** Nuclear Power Plant

### Location

Name: Fukushima Unit 2  
 City, county, state: <undefined>, <undefined>, <undefined>  
 Lat / Long / Elev: 37.4214° N, 141.0325° E, 0 m  
 Time zone: <undefined>  
 Population: not available

### Reactor Parameters

Reactor power: 2350 MWt  
 Average fuel burn-up: 30000 MWD / MTU  
 Containment type: BWR Mark I  
 Containment volume: 2.50E+05 ft<sup>3</sup>  
 Design pressure: 60 lb/in<sup>2</sup>  
 Design leak rate: 0.54 %/d  
 Coolant mass: 1.25E+05 kg  
 Assemblies in core: 550

### Source Term

Type: Time Core Is Uncovered  
 Shutdown: 2011/03/11 14:46  
 Core uncovered: 2011/03/15 06:00  
 Core recovered: 2011/03/15 07:00

### Release Pathway

Type: BWR - Release Through Dry Well  
 via direct, unfiltered pathway  
 Description: total failure of containment  
 Release height: 10. m

Release events  
 2011/03/16 19:05 Leak rate (% vol) Total failure  
 2011/03/16 19:05 Sprays Off

### Meteorology

Type: Actual Observations  
 Dataset name: Fukushima 16MAR 0945  
 Dataset desc: Obs/fcsts for Fukushima unit 2, 3, 4

| Summary of data<br>at release point: | Type | Dir<br>deg | Speed<br>m/s | Stab<br>class | Precip | Temp<br>°C |
|--------------------------------------|------|------------|--------------|---------------|--------|------------|
| 2011/03/12 14:00                     | Obs  | 265        | 1.0          | B             | ?      |            |
| 2011/03/12 15:00                     | Obs  | 265        | 1.0          | B             | ?      |            |
| 2011/03/12 16:00                     | Obs  | 277        | 1.3          | B             | ?      |            |
| 2011/03/12 17:00                     | Obs  | 260        | 2.4          | B             | ?      |            |
| 2011/03/12 18:00                     | Obs  | 241        | 1.4          | E             | ?      |            |
| 2011/03/12 19:00                     | Obs  | 236        | 2.1          | E             | ?      |            |
| 2011/03/12 20:00                     | Obs  | 239        | 2.1          | E             | ?      |            |
| 2011/03/12 21:00                     | Obs  | 229        | 3.8          | E             | ?      |            |
| 2011/03/12 22:00                     | Obs  | 224        | 5.1          | E             | ?      |            |
| 2011/03/12 23:00                     | Obs  | 226        | 3.9          | E             | ?      |            |
| 2011/03/13 00:00                     | Obs  | 228        | 4.1          | E             | ?      |            |

|                  |      |     |      |     |          |
|------------------|------|-----|------|-----|----------|
| 2011/03/13 01:00 | Obs  | 235 | 2.6  | E   | ?        |
| 2011/03/13 02:00 | Obs  | 233 | 3.9  | E   | ?        |
| 2011/03/13 03:00 | Obs  | 225 | 1.8  | E   | ?        |
| 2011/03/13 04:00 | Obs  | 225 | 1.3  | E   | ?        |
| 2011/03/13 05:00 | Obs  | 225 | 2.2  | E   | ?        |
| 2011/03/13 06:00 | Obs  | 225 | 2.2  | E   | ?        |
| 2011/03/13 07:00 | Obs  | 248 | 2.7  | E   | ?        |
| 2011/03/13 08:00 | Obs  | 248 | 2.7  | E   | ?        |
| 2011/03/13 09:00 | Obs  | 270 | 3.1  | E   | ?        |
| 2011/03/13 12:00 | Obs  | 271 | 7.4  | D   | ?        |
| 2011/03/13 13:00 | Obs  | 276 | 6.2  | D   | ?        |
| 2011/03/13 14:00 | Obs  | 312 | 2.8  | B   | ?        |
| 2011/03/14 18:00 | Obs  | 258 | 4.8  | unk | ?        |
| 2011/03/14 19:00 | Obs  | 268 | 5.0  | unk | ?        |
| 2011/03/14 20:00 | Obs  | 330 | 2.2  | unk | ?        |
| 2011/03/14 21:00 | Fcst | 337 | 4.6  | unk | ?        |
| 2011/03/14 22:00 | Fcst | 323 | 7.2  | unk | ?        |
| 2011/03/14 23:00 | Fcst | 305 | 6.6  | unk | ?        |
| 2011/03/15 00:00 | Fcst | 015 | 8.6  | unk | ?        |
| 2011/03/15 02:00 | Fcst | 002 | 7.5  | unk | ?        |
| 2011/03/15 03:00 | Fcst | 347 | 5.2  | E   | None     |
| 2011/03/15 04:00 | Fcst | 332 | 5.6  | E   | None     |
| 2011/03/15 05:00 | Fcst | 332 | 4.0  | E   | None     |
| 2011/03/15 06:00 | Fcst | 344 | 3.5  | E   | Lgt rain |
| 2011/03/15 07:00 | Fcst | 026 | 3.8  | E   | Lgt rain |
| 2011/03/15 08:00 | Fcst | 044 | 4.4  | E   | Lgt rain |
| 2011/03/15 09:00 | Fcst | 020 | 4.2  | E   | Lgt rain |
| 2011/03/15 10:00 | Fcst | 010 | 3.4  | E   | None     |
| 2011/03/15 11:00 | Fcst | 030 | 3.5  | D   | Lgt rain |
| 2011/03/15 12:00 | Fcst | 027 | 3.0  | D   | Lgt rain |
| 2011/03/15 13:00 | Fcst | 037 | 3.4  | D   | Lgt rain |
| 2011/03/15 14:00 | Fcst | 053 | 3.7  | B   | None     |
| 2011/03/15 15:00 | Fcst | 058 | 3.7  | B   | None     |
| 2011/03/15 16:00 | Fcst | 067 | 3.2  | C   | Lgt rain |
| 2011/03/15 17:00 | Fcst | 081 | 3.9  | C   | Lgt rain |
| 2011/03/15 18:00 | Fcst | 089 | 4.7  | B   | None     |
| 2011/03/15 19:00 | Fcst | 085 | 4.4  | B   | None     |
| 2011/03/15 20:00 | Fcst | 083 | 4.4  | B   | Lgt rain |
| 2011/03/15 21:00 | Fcst | 074 | 4.6  | C   | Lgt rain |
| 2011/03/15 22:00 | Fcst | 054 | 5.0  | D   | Lgt rain |
| 2011/03/15 23:00 | Fcst | 029 | 5.6  | D   | Rain     |
| 2011/03/16 00:00 | Fcst | 011 | 5.1  | D   | Lgt rain |
| 2011/03/16 01:00 | Fcst | 346 | 4.3  | C   | Lgt rain |
| 2011/03/16 02:00 | Fcst | 350 | 5.3  | D   | Lgt rain |
| 2011/03/16 03:00 | Fcst | 323 | 5.6  | D   | Lgt rain |
| 2011/03/16 04:00 | Fcst | 316 | 5.4  | D   | None     |
| 2011/03/16 05:00 | Fcst | 298 | 4.8  | D   | None     |
| 2011/03/16 06:00 | Fcst | 314 | 5.6  | D   | None     |
| 2011/03/16 07:00 | Fcst | 312 | 4.7  | D   | None     |
| 2011/03/16 08:00 | Fcst | 331 | 4.9  | D   | None     |
| 2011/03/16 09:00 | Fcst | 299 | 4.2  | D   | None     |
| 2011/03/16 10:00 | Fcst | 312 | 5.4  | C   | None     |
| 2011/03/16 11:00 | Fcst | 309 | 7.5  | C   | None     |
| 2011/03/16 12:00 | Fcst | 304 | 7.2  | C   | None     |
| 2011/03/16 13:00 | Fcst | 314 | 8.8  | C   | None     |
| 2011/03/16 14:00 | Fcst | 325 | 10.4 | C   | None     |

|                  |      |     |      |   |      |
|------------------|------|-----|------|---|------|
| 2011/03/16 15:00 | Fcst | 324 | 12.3 | C | None |
| 2011/03/16 16:00 | Fcst | 304 | 14.7 | D | None |
| 2011/03/16 17:00 | Fcst | 299 | 14.2 | D | None |
| 2011/03/16 18:00 | Fcst | 297 | 11.3 | D | None |
| 2011/03/16 19:00 | Fcst | 316 | 9.8  | D | None |
| 2011/03/16 20:00 | Fcst | 309 | 9.4  | D | None |
| 2011/03/16 21:00 | Fcst | 294 | 9.5  | D | None |
| 2011/03/16 22:00 | Fcst | 299 | 7.6  | D | None |
| 2011/03/16 23:00 | Fcst | 300 | 9.7  | D | None |
| 2011/03/17 00:00 | Fcst | 294 | 5.0  | D | None |
| 2011/03/17 01:00 | Fcst | 286 | 7.0  | D | None |
| 2011/03/17 02:00 | Fcst | 287 | 6.6  | D | None |
| 2011/03/17 03:00 | Fcst | 293 | 6.5  | D | None |
| 2011/03/17 04:00 | Fcst | 300 | 6.3  | D | None |
| 2011/03/17 05:00 | Fcst | 311 | 5.9  | D | None |
| 2011/03/17 06:00 | Fcst | 295 | 7.4  | D | None |
| 2011/03/17 07:00 | Fcst | 303 | 8.4  | C | None |
| 2011/03/17 08:00 | Fcst | 333 | 4.8  | C | None |
| 2011/03/17 09:00 | Fcst | 321 | 5.9  | C | None |
| 2011/03/17 10:00 | Fcst | 307 | 5.0  | C | None |
| 2011/03/17 11:00 | Fcst | 292 | 8.4  | C | None |
| 2011/03/17 12:00 | Fcst | 315 | 9.3  | C | None |
| 2011/03/17 13:00 | Fcst | 299 | 11.1 | C | None |
| 2011/03/17 14:00 | Fcst | 292 | 11.8 | C | None |
| 2011/03/17 15:00 | Fcst | 286 | 10.7 | C | None |
| 2011/03/17 16:00 | Fcst | 298 | 9.3  | D | None |
| 2011/03/17 17:00 | Fcst | 286 | 8.5  | D | None |
| 2011/03/17 18:00 | Fcst | 285 | 10.6 | D | None |
| 2011/03/17 19:00 | Fcst | 288 | 11.1 | D | None |
| 2011/03/17 20:00 | Fcst | 301 | 11.3 | D | None |
| 2011/03/17 21:00 | Fcst | 311 | 10.1 | D | None |
| 2011/03/17 22:00 | Fcst | 307 | 8.4  | D | None |
| 2011/03/17 23:00 | Fcst | 303 | 8.7  | D | None |
| 2011/03/18 00:00 | Fcst | 311 | 7.1  | D | None |
| 2011/03/18 01:00 | Fcst | 316 | 3.4  | D | None |
| 2011/03/18 02:00 | Fcst | 310 | 6.0  | D | None |
| 2011/03/18 03:00 | Fcst | 319 | 7.4  | D | None |
| 2011/03/18 04:00 | Fcst | 316 | 6.3  | D | None |
| 2011/03/18 05:00 | Fcst | 307 | 4.9  | D | None |
| 2011/03/18 06:00 | Fcst | 311 | 4.4  | D | None |
| 2011/03/18 07:00 | Fcst | 326 | 5.1  | C | None |
| 2011/03/18 08:00 | Fcst | 343 | 5.4  | C | None |
| 2011/03/18 09:00 | Fcst | 344 | 6.1  | C | None |

Dataset options:

Est. missing stability using: Wind speed, time of day, etc.  
 Adjust stability for consistency: No  
 Modify winds for topography: Yes

#### Calculations

Case description:

Fukushima Unit 2, 33% core melt with met 16MAR 0945 met data

End of calculations:

2011/03/17 19:05

Start of release to atmosphere + 24 h

Distance of calculation:

Close-in + to 50 miles

Close-in distances:

0.5, 1.0, 1.5, 2.0, 3.0, 5.0, 7.0, 10.0 miles

RASCAL v4.1.0 Source Term

File created: 2011/03/16 11:49

Case name: Fukushima Unit 3 spent fuel pool

Radionuclide units: Ci

| Interval | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Start    | 13:00    | 13:15    | 13:30    | 13:45    | 14:00    | 14:15    | 14:30    | 14:45    | 15:00    |
| Am-241   | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 |
| Ba-140   | 8.19E-01 | 8.18E-01 | 8.18E-01 | 8.17E-01 | 8.17E-01 | 8.16E-01 | 8.16E-01 | 8.15E-01 | 8.15E-01 |
| Ce-141   | 7.91E-02 | 7.91E-02 | 7.91E-02 | 7.91E-02 | 7.90E-02 | 7.90E-02 | 7.90E-02 | 7.90E-02 | 7.90E-02 |
| Ce-144   | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 |
| Cm-242   | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 |
| Cs-134   | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 |
| Cs-136   | 1.52E+01 | 1.52E+01 | 1.52E+01 | 1.52E+01 | 1.52E+01 | 1.52E+01 | 1.52E+01 | 1.52E+01 | 1.51E+01 |
| Cs-137   | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 |
| I-131    | 2.10E+01 | 2.10E+01 | 2.10E+01 | 2.10E+01 | 2.10E+01 | 2.09E+01 | 2.09E+01 | 2.09E+01 | 2.09E+01 |
| I-132    | 3.46E-05 | 3.20E-05 | 2.98E-05 | 2.76E-05 | 2.57E-05 | 2.39E-05 | 2.21E-05 | 2.06E-05 | 1.92E-05 |
| Kr-85    | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 |
| La-140   | 3.08E-02 | 3.42E-02 | 3.75E-02 | 4.09E-02 | 4.42E-02 | 4.75E-02 | 5.09E-02 | 5.41E-02 | 5.73E-02 |
| Nb-95    | 4.12E-01 | 4.12E-01 | 4.12E-01 | 4.12E-01 | 4.12E-01 | 4.12E-01 | 4.12E-01 | 4.12E-01 | 4.11E-01 |
| Nd-147   | 4.19E-04 | 4.19E-04 | 4.19E-04 | 4.19E-04 | 4.18E-04 | 4.18E-04 | 4.18E-04 | 4.17E-04 | 4.17E-04 |
| Pm-147   | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 |
| Pr-143   | 3.30E-03 | 3.30E-03 | 3.29E-03 | 3.29E-03 | 3.29E-03 | 3.29E-03 | 3.29E-03 | 3.29E-03 | 3.29E-03 |
| Pr-144   | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 |
| Pu-238   | 2.10E-04 | 2.10E-04 | 2.10E-04 | 2.10E-04 | 2.10E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 |
| Pu-239   | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 |
| Pu-241   | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 |
| Rb-86    | 2.79E+00 | 2.79E+00 | 2.79E+00 | 2.79E+00 | 2.78E+00 | 2.78E+00 | 2.78E+00 | 2.78E+00 | 2.78E+00 |
| Rh-103m  | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 |
| Ru-103   | 3.42E-01 | 3.42E-01 | 3.42E-01 | 3.42E-01 | 3.42E-01 | 3.42E-01 | 3.42E-01 | 3.42E-01 | 3.42E-01 |
| Ru-106   | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 |
| Sb-127   | 9.36E-07 | 9.36E-07 | 9.36E-07 | 9.36E-07 | 9.27E-07 | 9.27E-07 | 9.27E-07 | 9.27E-07 | 9.27E-07 |
| Sr-89    | 2.85E+01 | 2.85E+01 | 2.85E+01 | 2.85E+01 | 2.85E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 |
| Sr-90    | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 |
| Te-127   | 1.03E+01 | 1.03E+01 | 1.03E+01 | 1.03E+01 | 1.03E+01 | 1.03E+01 | 1.03E+01 | 1.03E+01 | 1.03E+01 |
| Te-127m  | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 |
| Te-129   | 6.36E+00 | 6.36E+00 | 6.36E+00 | 6.36E+00 | 6.36E+00 | 6.35E+00 | 6.35E+00 | 6.35E+00 | 6.35E+00 |
| Te-129m  | 9.81E+00 | 9.81E+00 | 9.81E+00 | 9.81E+00 | 9.81E+00 | 9.81E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 |
| Te-132   | 5.12E-07 | 5.11E-07 | 5.10E-07 | 5.09E-07 | 5.08E-07 | 5.07E-07 | 5.06E-07 | 5.05E-07 | 5.03E-07 |
| Xe-131m  | 7.16E+00 | 7.16E+00 | 7.15E+00 | 7.15E+00 | 7.14E+00 | 7.14E+00 | 7.13E+00 | 7.13E+00 | 7.12E+00 |
| Xe-133   | 5.24E-01 | 5.23E-01 | 5.22E-01 | 5.22E-01 | 5.21E-01 | 5.20E-01 | 5.19E-01 | 5.19E-01 | 5.18E-01 |
| Xe-133m  | 8.22E-11 | 8.19E-11 | 8.16E-11 | 8.14E-11 | 8.11E-11 | 8.08E-11 | 8.06E-11 | 8.03E-11 | 8.00E-11 |
| Y-90     | 1.08E+00 | 1.19E+00 | 1.31E+00 | 1.42E+00 | 1.53E+00 | 1.65E+00 | 1.76E+00 | 1.87E+00 | 1.99E+00 |
| Y-91     | 1.53E-01 | 1.53E-01 | 1.53E-01 | 1.53E-01 | 1.53E-01 | 1.53E-01 | 1.53E-01 | 1.53E-01 | 1.53E-01 |
| Zr-95    | 2.37E-01 | 2.37E-01 | 2.37E-01 | 2.37E-01 | 2.37E-01 | 2.37E-01 | 2.37E-01 | 2.37E-01 | 2.37E-01 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 15:15    | 15:30    | 15:45    | 16:00    | 16:15    | 16:30    | 16:45    | 17:00    | 17:15    | 17:30    |
| 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 |
| 8.15E-01 | 8.15E-01 | 8.14E-01 | 8.14E-01 | 8.13E-01 | 8.13E-01 | 8.12E-01 | 8.12E-01 | 8.11E-01 | 8.10E-01 |
| 7.89E-02 | 7.89E-02 | 7.89E-02 | 7.89E-02 | 7.89E-02 | 7.88E-02 | 7.88E-02 | 7.88E-02 | 7.88E-02 | 7.88E-02 |
| 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.97E-01 |
| 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 |
| 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 |
| 1.51E+01 | 1.51E+01 | 1.51E+01 | 1.51E+01 | 1.51E+01 | 1.51E+01 | 1.51E+01 | 1.51E+01 | 1.51E+01 | 1.51E+01 |
| 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 |
| 2.09E+01 | 2.08E+01 | 2.08E+01 | 2.08E+01 | 2.08E+01 | 2.08E+01 | 2.07E+01 | 2.07E+01 | 2.07E+01 | 2.07E+01 |
| 1.78E-05 | 1.66E-05 | 1.54E-05 | 1.43E-05 | 1.33E-05 | 1.23E-05 | 1.15E-05 | 1.07E-05 | 9.99E-06 | 9.27E-06 |
| 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 |
| 6.06E-02 | 6.38E-02 | 6.71E-02 | 7.03E-02 | 7.34E-02 | 7.66E-02 | 7.97E-02 | 8.29E-02 | 8.60E-02 | 8.91E-02 |
| 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.11E-01 |
| 4.17E-04 | 4.16E-04 | 4.16E-04 | 4.16E-04 | 4.16E-04 | 4.15E-04 | 4.15E-04 | 4.15E-04 | 4.14E-04 | 4.14E-04 |
| 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 |
| 3.29E-03 | 3.29E-03 | 3.29E-03 | 3.28E-03 | 3.28E-03 | 3.28E-03 | 3.28E-03 | 3.28E-03 | 3.27E-03 | 3.27E-03 |
| 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 | 5.98E-01 |
| 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 |
| 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 |
| 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 |
| 2.78E+00 | 2.78E+00 | 2.78E+00 | 2.77E+00 | 2.77E+00 | 2.77E+00 | 2.77E+00 | 2.77E+00 | 2.77E+00 | 2.77E+00 |
| 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 |
| 3.42E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 |
| 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 |
| 9.27E-07 | 9.18E-07 | 9.18E-07 | 9.18E-07 | 9.18E-07 | 9.18E-07 | 9.09E-07 | 9.09E-07 | 9.09E-07 | 9.09E-07 |
| 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 |
| 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 |
| 1.03E+01 | 1.03E+01 | 1.03E+01 | 1.03E+01 | 1.03E+01 | 1.03E+01 | 1.03E+01 | 1.03E+01 | 1.04E+01 | 1.04E+01 |
| 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 |
| 6.35E+00 | 6.35E+00 | 6.35E+00 | 6.35E+00 | 6.35E+00 | 6.35E+00 | 6.35E+00 | 6.35E+00 | 6.35E+00 | 6.34E+00 |
| 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 |
| 5.02E-07 | 5.01E-07 | 5.00E-07 | 4.99E-07 | 4.98E-07 | 4.97E-07 | 4.96E-07 | 4.95E-07 | 4.93E-07 | 4.92E-07 |
| 7.12E+00 | 7.11E+00 | 7.11E+00 | 7.10E+00 | 7.10E+00 | 7.09E+00 | 7.09E+00 | 7.09E+00 | 7.08E+00 | 7.08E+00 |
| 5.18E-01 | 5.17E-01 | 5.16E-01 | 5.16E-01 | 5.15E-01 | 5.14E-01 | 5.13E-01 | 5.12E-01 | 5.12E-01 | 5.11E-01 |
| 7.97E-11 | 7.95E-11 | 7.92E-11 | 7.90E-11 | 7.88E-11 | 7.85E-11 | 7.82E-11 | 7.79E-11 | 7.77E-11 | 7.74E-11 |
| 2.10E+00 | 2.21E+00 | 2.32E+00 | 2.43E+00 | 2.55E+00 | 2.66E+00 | 2.76E+00 | 2.88E+00 | 2.99E+00 | 3.10E+00 |
| 1.53E-01 | 1.53E-01 | 1.53E-01 | 1.53E-01 | 1.53E-01 | 1.53E-01 | 1.53E-01 | 1.53E-01 | 1.53E-01 | 1.53E-01 |
| 2.37E-01 | 2.37E-01 | 2.37E-01 | 2.37E-01 | 2.37E-01 | 2.37E-01 | 2.37E-01 | 2.37E-01 | 2.37E-01 | 2.36E-01 |



| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | ##### |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------|
| 17:45    | 18:00    | 18:15    | 18:30    | 18:45    | 19:00    | 19:15    | 19:30    | 19:45    | 20:00    |       |
| 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 |       |
| 8.10E-01 | 8.09E-01 | 8.09E-01 | 8.08E-01 | 8.08E-01 | 8.07E-01 | 8.07E-01 | 8.06E-01 | 8.06E-01 | 8.06E-01 |       |
| 7.88E-02 | 7.88E-02 | 7.88E-02 | 7.88E-02 | 7.88E-02 | 7.87E-02 | 7.87E-02 | 7.87E-02 | 7.87E-02 | 7.87E-02 |       |
| 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 |       |
| 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 |       |
| 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 |       |
| 1.50E+01 | 1.50E+01 | 1.50E+01 | 1.50E+01 | 1.50E+01 | 1.50E+01 | 1.50E+01 | 1.50E+01 | 1.50E+01 | 1.50E+01 |       |
| 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 |       |
| 2.06E+01 | 2.06E+01 | 2.06E+01 | 2.06E+01 | 2.06E+01 | 2.05E+01 | 2.05E+01 | 2.05E+01 | 2.05E+01 | 2.05E+01 |       |
| 8.63E-06 | 8.04E-06 | 7.49E-06 | 6.98E-06 | 6.51E-06 | 6.08E-06 | 5.67E-06 | 5.29E-06 | 4.94E-06 | 4.62E-06 |       |
| 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 |       |
| 9.18E-02 | 9.54E-02 | 9.81E-02 | 1.02E-01 | 1.04E-01 | 1.07E-01 | 1.11E-01 | 1.13E-01 | 1.16E-01 | 1.20E-01 |       |
| 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.11E-01 |       |
| 4.14E-04 | 4.13E-04 | 4.13E-04 | 4.13E-04 | 4.13E-04 | 4.12E-04 | 4.12E-04 | 4.12E-04 | 4.11E-04 | 4.11E-04 |       |
| 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 |       |
| 3.27E-03 | 3.27E-03 | 3.27E-03 | 3.26E-03 | 3.26E-03 | 3.26E-03 | 3.26E-03 | 3.26E-03 | 3.25E-03 | 3.25E-03 |       |
| 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 |       |
| 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 |       |
| 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 |       |
| 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 |       |
| 2.77E+00 | 2.77E+00 | 2.76E+00 | 2.76E+00 | 2.76E+00 | 2.76E+00 | 2.76E+00 | 2.76E+00 | 2.76E+00 | 2.76E+00 |       |
| 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.39E-01 |       |
| 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.41E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 |       |
| 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 |       |
| 9.09E-07 | 9.00E-07 | 9.00E-07 | 9.00E-07 | 8.99E-07 | 8.97E-07 | 8.96E-07 | 8.94E-07 | 8.92E-07 | 8.90E-07 |       |
| 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 |       |
| 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 |       |
| 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 |       |
| 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 |       |
| 6.34E+00 | 6.34E+00 | 6.34E+00 | 6.34E+00 | 6.34E+00 | 6.33E+00 | 6.33E+00 | 6.33E+00 | 6.33E+00 | 6.33E+00 |       |
| 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 |       |
| 4.91E-07 | 4.91E-07 | 4.90E-07 | 4.88E-07 | 4.87E-07 | 4.86E-07 | 4.85E-07 | 4.84E-07 | 4.82E-07 | 4.82E-07 |       |
| 7.07E+00 | 7.07E+00 | 7.07E+00 | 7.07E+00 | 7.06E+00 | 7.06E+00 | 7.05E+00 | 7.05E+00 | 7.04E+00 | 7.04E+00 |       |
| 5.10E-01 | 5.09E-01 | 5.09E-01 | 5.09E-01 | 5.08E-01 | 5.07E-01 | 5.06E-01 | 5.06E-01 | 5.05E-01 | 5.04E-01 |       |
| 7.72E-11 | 7.70E-11 | 7.67E-11 | 7.64E-11 | 7.61E-11 | 7.60E-11 | 7.57E-11 | 7.54E-11 | 7.52E-11 | 7.49E-11 |       |
| 3.20E+00 | 3.31E+00 | 3.42E+00 | 3.53E+00 | 3.64E+00 | 3.74E+00 | 3.85E+00 | 3.96E+00 | 4.07E+00 | 4.18E+00 |       |
| 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 |       |
| 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 |       |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 20:15    | 20:30    | 20:45    | 21:00    | 21:15    | 21:30    | 21:45    | 22:00    | 22:15    | 22:30    |          |
| 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 |
| 8.06E-01 | 8.05E-01 | 8.05E-01 | 8.04E-01 | 8.04E-01 | 8.03E-01 | 8.03E-01 | 8.02E-01 | 8.02E-01 | 8.01E-01 | 8.01E-01 |
| 7.86E-02 | 7.86E-02 | 7.86E-02 | 7.86E-02 | 7.86E-02 | 7.86E-02 | 7.85E-02 | 7.85E-02 | 7.85E-02 | 7.85E-02 | 7.85E-02 |
| 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 |
| 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.31E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 |
| 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 |
| 1.50E+01 | 1.49E+01 | 1.49E+01 | 1.49E+01 | 1.49E+01 | 1.49E+01 | 1.49E+01 | 1.49E+01 | 1.49E+01 | 1.49E+01 | 1.49E+01 |
| 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 |
| 2.04E+01 | 2.04E+01 | 2.04E+01 | 2.04E+01 | 2.04E+01 | 2.03E+01 | 2.03E+01 | 2.03E+01 | 2.03E+01 | 2.03E+01 | 2.03E+01 |
| 4.32E-06 | 4.04E-06 | 3.78E-06 | 3.54E-06 | 3.32E-06 | 3.11E-06 | 2.93E-06 | 2.75E-06 | 2.58E-06 | 2.43E-06 | 2.43E-06 |
| 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 |
| 1.22E-01 | 1.25E-01 | 1.28E-01 | 1.31E-01 | 1.34E-01 | 1.37E-01 | 1.40E-01 | 1.42E-01 | 1.45E-01 | 1.49E-01 | 1.49E-01 |
| 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.11E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 |
| 4.11E-04 | 4.10E-04 | 4.10E-04 | 4.10E-04 | 4.10E-04 | 4.10E-04 | 4.10E-04 | 4.10E-04 | 4.10E-04 | 4.09E-04 | 4.09E-04 |
| 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 |
| 3.25E-03 | 3.25E-03 | 3.25E-03 | 3.25E-03 | 3.24E-03 | 3.24E-03 | 3.24E-03 | 3.24E-03 | 3.24E-03 | 3.24E-03 | 3.23E-03 |
| 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 |
| 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 |
| 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 |
| 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 |
| 2.75E+00 | 2.75E+00 | 2.75E+00 | 2.75E+00 | 2.75E+00 | 2.75E+00 | 2.75E+00 | 2.75E+00 | 2.75E+00 | 2.75E+00 | 2.75E+00 |
| 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 |
| 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 | 3.40E-01 |
| 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 |
| 8.88E-07 | 8.87E-07 | 8.86E-07 | 8.84E-07 | 8.82E-07 | 8.80E-07 | 8.78E-07 | 8.77E-07 | 8.76E-07 | 8.74E-07 | 8.74E-07 |
| 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 |
| 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 |
| 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 |
| 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.08E+01 | 1.07E+01 |
| 6.33E+00 | 6.33E+00 | 6.32E+00 | 6.32E+00 | 6.32E+00 | 6.32E+00 | 6.32E+00 | 6.32E+00 | 6.32E+00 | 6.32E+00 | 6.31E+00 |
| 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 |
| 4.81E-07 | 4.80E-07 | 4.79E-07 | 4.77E-07 | 4.76E-07 | 4.75E-07 | 4.74E-07 | 4.73E-07 | 4.73E-07 | 4.71E-07 | 4.71E-07 |
| 7.03E+00 | 7.03E+00 | 7.02E+00 | 7.02E+00 | 7.01E+00 | 7.01E+00 | 7.00E+00 | 7.00E+00 | 7.00E+00 | 7.00E+00 | 6.99E+00 |
| 5.03E-01 | 5.03E-01 | 5.02E-01 | 5.01E-01 | 5.00E-01 | 5.00E-01 | 5.00E-01 | 4.99E-01 | 4.98E-01 | 4.97E-01 | 4.97E-01 |
| 7.47E-11 | 7.44E-11 | 7.42E-11 | 7.40E-11 | 7.37E-11 | 7.34E-11 | 7.33E-11 | 7.30E-11 | 7.27E-11 | 7.25E-11 | 7.25E-11 |
| 4.28E+00 | 4.39E+00 | 4.50E+00 | 4.60E+00 | 4.71E+00 | 4.82E+00 | 4.91E+00 | 5.02E+00 | 5.12E+00 | 5.23E+00 | 5.23E+00 |
| 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 |
| 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | ##### |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------|
| 22:45    | 23:00    | 23:15    | 23:30    | 23:45    | 0:00     | 0:15     | 0:30     | 0:45     | 1:00     |       |
| 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 |       |
| 8.01E-01 | 8.00E-01 | 8.00E-01 | 7.99E-01 | 7.99E-01 | 7.98E-01 | 7.98E-01 | 7.97E-01 | 7.97E-01 | 7.97E-01 |       |
| 7.85E-02 | 7.84E-02 | 7.84E-02 | 7.84E-02 | 7.84E-02 | 7.84E-02 | 7.84E-02 | 7.83E-02 | 7.83E-02 | 7.83E-02 |       |
| 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 |       |
| 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 |       |
| 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 |       |
| 1.49E+01 | 1.49E+01 | 1.49E+01 | 1.49E+01 | 1.49E+01 | 1.49E+01 | 1.49E+01 | 1.49E+01 | 1.49E+01 | 1.49E+01 |       |
| 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 |       |
| 2.03E+01 | 2.03E+01 | 2.03E+01 | 2.03E+01 | 2.03E+01 | 2.02E+01 | 2.02E+01 | 2.02E+01 | 2.02E+01 | 2.02E+01 |       |
| 2.29E-06 | 2.15E-06 | 2.03E-06 | 1.92E-06 | 1.81E-06 | 1.71E-06 | 1.62E-06 | 1.54E-06 | 1.46E-06 | 1.39E-06 |       |
| 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 |       |
| 1.51E-01 | 1.54E-01 | 1.57E-01 | 1.59E-01 | 1.62E-01 | 1.65E-01 | 1.67E-01 | 1.70E-01 | 1.73E-01 | 1.76E-01 |       |
| 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 |       |
| 4.09E-04 | 4.08E-04 | 4.08E-04 | 4.08E-04 | 4.08E-04 | 4.07E-04 | 4.07E-04 | 4.07E-04 | 4.06E-04 | 4.06E-04 |       |
| 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 |       |
| 3.23E-03 | 3.23E-03 | 3.23E-03 | 3.23E-03 | 3.22E-03 | 3.22E-03 | 3.22E-03 | 3.22E-03 | 3.22E-03 | 3.21E-03 |       |
| 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 |       |
| 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 |       |
| 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 |       |
| 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 |       |
| 2.75E+00 | 2.75E+00 | 2.75E+00 | 2.75E+00 | 2.75E+00 | 2.75E+00 | 2.75E+00 | 2.74E+00 | 2.74E+00 | 2.74E+00 |       |
| 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 |       |
| 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 |       |
| 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 |       |
| 8.72E-07 | 8.70E-07 | 8.69E-07 | 8.68E-07 | 8.66E-07 | 8.64E-07 | 8.62E-07 | 8.60E-07 | 8.60E-07 | 8.58E-07 |       |
| 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 | 2.84E+01 |       |
| 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 |       |
| 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 |       |
| 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 |       |
| 6.31E+00 | 6.31E+00 | 6.31E+00 | 6.31E+00 | 6.31E+00 | 6.30E+00 | 6.30E+00 | 6.30E+00 | 6.30E+00 | 6.30E+00 |       |
| 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 | 9.72E+00 |       |
| 4.70E-07 | 4.69E-07 | 4.68E-07 | 4.67E-07 | 4.66E-07 | 4.65E-07 | 4.64E-07 | 4.63E-07 | 4.62E-07 | 4.61E-07 |       |
| 6.99E+00 | 6.98E+00 | 6.98E+00 | 6.98E+00 | 6.98E+00 | 6.97E+00 | 6.97E+00 | 6.96E+00 | 6.96E+00 | 6.95E+00 |       |
| 4.97E-01 | 4.96E-01 | 4.95E-01 | 4.94E-01 | 4.94E-01 | 4.93E-01 | 4.92E-01 | 4.91E-01 | 4.91E-01 | 4.91E-01 |       |
| 7.23E-11 | 7.20E-11 | 7.18E-11 | 7.16E-11 | 7.13E-11 | 7.11E-11 | 7.08E-11 | 7.07E-11 | 7.04E-11 | 7.01E-11 |       |
| 5.34E+00 | 5.44E+00 | 5.54E+00 | 5.64E+00 | 5.74E+00 | 5.85E+00 | 5.95E+00 | 6.05E+00 | 6.16E+00 | 6.26E+00 |       |
| 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 |       |
| 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.36E-01 |       |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1:15     | 1:30     | 1:45     | 2:00     | 2:15     | 2:30     | 2:45     | 3:00     | 3:15     | 3:30     |          |
| 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 |
| 7.97E-01 | 7.96E-01 | 7.96E-01 | 7.95E-01 | 7.95E-01 | 7.94E-01 | 7.94E-01 | 7.93E-01 | 7.93E-01 | 7.92E-01 | 7.92E-01 |
| 7.83E-02 | 7.82E-02 | 7.82E-02 | 7.82E-02 | 7.82E-02 | 7.82E-02 | 7.82E-02 | 7.81E-02 | 7.81E-02 | 7.81E-02 | 7.81E-02 |
| 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 |
| 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 |
| 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 |
| 1.49E+01 | 1.49E+01 | 1.49E+01 | 1.48E+01 | 1.48E+01 | 1.48E+01 | 1.48E+01 | 1.48E+01 | 1.48E+01 | 1.48E+01 | 1.48E+01 |
| 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 |
| 2.01E+01 | 2.01E+01 | 2.01E+01 | 2.01E+01 | 2.01E+01 | 2.00E+01 | 2.00E+01 | 2.00E+01 | 2.00E+01 | 2.00E+01 | 2.00E+01 |
| 1.32E-06 | 1.26E-06 | 1.20E-06 | 1.14E-06 | 1.10E-06 | 1.05E-06 | 1.01E-06 | 9.63E-07 | 9.27E-07 | 8.94E-07 | 8.94E-07 |
| 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 |
| 1.78E-01 | 1.81E-01 | 1.84E-01 | 1.86E-01 | 1.89E-01 | 1.92E-01 | 1.94E-01 | 1.96E-01 | 1.99E-01 | 2.02E-01 | 2.02E-01 |
| 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 |
| 4.06E-04 | 4.05E-04 | 4.05E-04 | 4.05E-04 | 4.05E-04 | 4.04E-04 | 4.04E-04 | 4.04E-04 | 4.03E-04 | 4.03E-04 | 4.03E-04 |
| 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 |
| 3.21E-03 | 3.21E-03 | 3.21E-03 | 3.21E-03 | 3.21E-03 | 3.20E-03 | 3.20E-03 | 3.20E-03 | 3.20E-03 | 3.20E-03 | 3.20E-03 |
| 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 |
| 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 |
| 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 |
| 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 |
| 2.74E+00 | 2.74E+00 | 2.74E+00 | 2.74E+00 | 2.74E+00 | 2.73E+00 | 2.73E+00 | 2.73E+00 | 2.73E+00 | 2.73E+00 | 2.73E+00 |
| 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 |
| 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.39E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 |
| 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 |
| 8.56E-07 | 8.54E-07 | 8.52E-07 | 8.51E-07 | 8.50E-07 | 8.48E-07 | 8.46E-07 | 8.45E-07 | 8.43E-07 | 8.42E-07 | 8.42E-07 |
| 2.83E+01 | 2.83E+01 | 2.83E+01 | 2.83E+01 | 2.83E+01 | 2.83E+01 | 2.83E+01 | 2.83E+01 | 2.83E+01 | 2.83E+01 | 2.83E+01 |
| 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 |
| 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 |
| 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 |
| 6.30E+00 | 6.30E+00 | 6.29E+00 | 6.29E+00 | 6.29E+00 | 6.29E+00 | 6.29E+00 | 6.29E+00 | 6.29E+00 | 6.29E+00 | 6.28E+00 |
| 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 |
| 4.60E-07 | 4.59E-07 | 4.58E-07 | 4.56E-07 | 4.55E-07 | 4.55E-07 | 4.54E-07 | 4.53E-07 | 4.52E-07 | 4.51E-07 | 4.51E-07 |
| 6.95E+00 | 6.94E+00 | 6.94E+00 | 6.93E+00 | 6.93E+00 | 6.93E+00 | 6.92E+00 | 6.92E+00 | 6.91E+00 | 6.91E+00 | 6.91E+00 |
| 4.90E-01 | 4.89E-01 | 4.89E-01 | 4.88E-01 | 4.87E-01 | 4.86E-01 | 4.86E-01 | 4.85E-01 | 4.84E-01 | 4.83E-01 | 4.83E-01 |
| 6.99E-11 | 6.97E-11 | 6.95E-11 | 6.92E-11 | 6.90E-11 | 6.88E-11 | 6.86E-11 | 6.83E-11 | 6.81E-11 | 6.79E-11 | 6.79E-11 |
| 6.35E+00 | 6.45E+00 | 6.55E+00 | 6.65E+00 | 6.76E+00 | 6.86E+00 | 6.96E+00 | 7.06E+00 | 7.16E+00 | 7.25E+00 | 7.25E+00 |
| 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 |
| 2.36E-01 | 2.36E-01 | 2.36E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | ##### |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------|
| 3:45     | 4:00     | 4:15     | 4:30     | 4:45     | 5:00     | 5:15     | 5:30     | 5:45     | 6:00     |       |
| 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 |       |
| 7.92E-01 | 7.91E-01 | 7.91E-01 | 7.90E-01 | 7.90E-01 | 7.89E-01 | 7.89E-01 | 7.88E-01 | 7.88E-01 | 7.88E-01 |       |
| 7.81E-02 | 7.80E-02 | 7.80E-02 | 7.80E-02 | 7.80E-02 | 7.80E-02 | 7.80E-02 | 7.79E-02 | 7.79E-02 | 7.79E-02 |       |
| 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 |       |
| 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 |       |
| 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 |       |
| 1.48E+01 | 1.48E+01 | 1.48E+01 | 1.48E+01 | 1.47E+01 | 1.47E+01 | 1.47E+01 | 1.47E+01 | 1.47E+01 | 1.47E+01 |       |
| 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 |       |
| 1.99E+01 | 1.99E+01 | 1.99E+01 | 1.99E+01 | 1.99E+01 | 1.98E+01 | 1.98E+01 | 1.98E+01 | 1.98E+01 | 1.98E+01 |       |
| 8.62E-07 | 8.32E-07 | 8.04E-07 | 7.79E-07 | 7.54E-07 | 7.32E-07 | 7.11E-07 | 6.91E-07 | 6.73E-07 | 6.56E-07 |       |
| 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 |       |
| 2.04E-01 | 2.07E-01 | 2.09E-01 | 2.12E-01 | 2.14E-01 | 2.17E-01 | 2.19E-01 | 2.21E-01 | 2.24E-01 | 2.26E-01 |       |
| 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 |       |
| 4.03E-04 | 4.03E-04 | 4.02E-04 | 4.02E-04 | 4.02E-04 | 4.01E-04 | 4.01E-04 | 4.01E-04 | 4.01E-04 | 4.01E-04 |       |
| 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 |       |
| 3.20E-03 | 3.20E-03 | 3.20E-03 | 3.20E-03 | 3.20E-03 | 3.19E-03 | 3.19E-03 | 3.19E-03 | 3.19E-03 | 3.19E-03 |       |
| 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 |       |
| 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 |       |
| 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 |       |
| 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 |       |
| 2.73E+00 | 2.73E+00 | 2.73E+00 | 2.73E+00 | 2.72E+00 | 2.72E+00 | 2.72E+00 | 2.72E+00 | 2.72E+00 | 2.72E+00 |       |
| 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 |       |
| 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 |       |
| 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 |       |
| 8.40E-07 | 8.39E-07 | 8.37E-07 | 8.35E-07 | 8.33E-07 | 8.33E-07 | 8.31E-07 | 8.29E-07 | 8.27E-07 | 8.26E-07 |       |
| 2.83E+01 | 2.83E+01 | 2.83E+01 | 2.83E+01 | 2.83E+01 | 2.83E+01 | 2.83E+01 | 2.83E+01 | 2.83E+01 | 2.83E+01 |       |
| 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 |       |
| 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 |       |
| 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 |       |
| 6.28E+00 | 6.28E+00 | 6.28E+00 | 6.28E+00 | 6.28E+00 | 6.27E+00 | 6.27E+00 | 6.27E+00 | 6.27E+00 | 6.27E+00 |       |
| 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 |       |
| 4.50E-07 | 4.49E-07 | 4.47E-07 | 4.46E-07 | 4.46E-07 | 4.45E-07 | 4.44E-07 | 4.43E-07 | 4.42E-07 | 4.41E-07 |       |
| 6.90E+00 | 6.90E+00 | 6.89E+00 | 6.89E+00 | 6.89E+00 | 6.89E+00 | 6.88E+00 | 6.88E+00 | 6.88E+00 | 6.87E+00 |       |
| 4.83E-01 | 4.82E-01 | 4.82E-01 | 4.82E-01 | 4.81E-01 | 4.80E-01 | 4.79E-01 | 4.79E-01 | 4.78E-01 | 4.77E-01 |       |
| 6.77E-11 | 6.74E-11 | 6.72E-11 | 6.70E-11 | 6.68E-11 | 6.65E-11 | 6.63E-11 | 6.61E-11 | 6.59E-11 | 6.57E-11 |       |
| 7.34E+00 | 7.44E+00 | 7.54E+00 | 7.64E+00 | 7.74E+00 | 7.84E+00 | 7.93E+00 | 8.03E+00 | 8.13E+00 | 8.22E+00 |       |
| 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.52E-01 | 1.51E-01 | 1.51E-01 |       |
| 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 |       |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 6:15     | 6:30     | 6:45     | 7:00     | 7:15     | 7:30     | 7:45     | 8:00     | 8:15     | 8:30     |
| 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 |
| 7.88E-01 | 7.87E-01 | 7.87E-01 | 7.86E-01 | 7.86E-01 | 7.85E-01 | 7.85E-01 | 7.84E-01 | 7.84E-01 | 7.83E-01 |
| 7.79E-02 | 7.79E-02 | 7.79E-02 | 7.79E-02 | 7.79E-02 | 7.79E-02 | 7.79E-02 | 7.78E-02 | 7.78E-02 | 7.78E-02 |
| 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.96E-01 | 5.96E-01 |
| 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 |
| 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 |
| 1.47E+01 | 1.47E+01 | 1.47E+01 | 1.47E+01 | 1.47E+01 | 1.46E+01 | 1.46E+01 | 1.46E+01 | 1.46E+01 | 1.46E+01 |
| 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 |
| 1.97E+01 | 1.97E+01 | 1.97E+01 | 1.97E+01 | 1.97E+01 | 1.96E+01 | 1.96E+01 | 1.96E+01 | 1.96E+01 | 1.96E+01 |
| 6.41E-07 | 6.26E-07 | 6.13E-07 | 5.99E-07 | 5.88E-07 | 5.77E-07 | 5.66E-07 | 5.57E-07 | 5.48E-07 | 5.39E-07 |
| 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 |
| 2.29E-01 | 2.31E-01 | 2.33E-01 | 2.36E-01 | 2.39E-01 | 2.40E-01 | 2.43E-01 | 2.45E-01 | 2.48E-01 | 2.50E-01 |
| 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 |
| 4.01E-04 | 4.01E-04 | 4.00E-04 | 4.00E-04 | 4.00E-04 | 3.99E-04 | 3.99E-04 | 3.99E-04 | 3.99E-04 | 3.98E-04 |
| 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 |
| 3.19E-03 | 3.18E-03 | 3.18E-03 | 3.18E-03 | 3.18E-03 | 3.18E-03 | 3.17E-03 | 3.17E-03 | 3.17E-03 | 3.17E-03 |
| 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.97E-01 | 5.96E-01 |
| 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 |
| 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 |
| 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 |
| 2.72E+00 | 2.72E+00 | 2.72E+00 | 2.71E+00 | 2.71E+00 | 2.71E+00 | 2.71E+00 | 2.71E+00 | 2.71E+00 | 2.71E+00 |
| 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 |
| 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.38E-01 |
| 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 |
| 8.24E-07 | 8.23E-07 | 8.22E-07 | 8.20E-07 | 8.18E-07 | 8.16E-07 | 8.15E-07 | 8.14E-07 | 8.12E-07 | 8.11E-07 |
| 2.83E+01 | 2.83E+01 | 2.82E+01 | 2.82E+01 | 2.82E+01 | 2.82E+01 | 2.82E+01 | 2.82E+01 | 2.82E+01 | 2.82E+01 |
| 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 |
| 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 |
| 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 |
| 6.27E+00 | 6.27E+00 | 6.26E+00 | 6.26E+00 | 6.26E+00 | 6.26E+00 | 6.26E+00 | 6.26E+00 | 6.26E+00 | 6.26E+00 |
| 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 |
| 4.40E-07 | 4.39E-07 | 4.38E-07 | 4.37E-07 | 4.36E-07 | 4.35E-07 | 4.34E-07 | 4.33E-07 | 4.32E-07 | 4.31E-07 |
| 6.87E+00 | 6.86E+00 | 6.86E+00 | 6.85E+00 | 6.85E+00 | 6.84E+00 | 6.84E+00 | 6.83E+00 | 6.83E+00 | 6.82E+00 |
| 4.76E-01 | 4.76E-01 | 4.75E-01 | 4.74E-01 | 4.73E-01 | 4.73E-01 | 4.73E-01 | 4.72E-01 | 4.72E-01 | 4.71E-01 |
| 6.54E-11 | 6.53E-11 | 6.50E-11 | 6.48E-11 | 6.46E-11 | 6.44E-11 | 6.42E-11 | 6.40E-11 | 6.37E-11 | 6.35E-11 |
| 8.32E+00 | 8.42E+00 | 8.51E+00 | 8.60E+00 | 8.69E+00 | 8.79E+00 | 8.88E+00 | 8.97E+00 | 9.09E+00 | 9.18E+00 |
| 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 |
| 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 8:45     | 9:00     | 9:15     | 9:30     | 9:45     | 10:00    | 10:15    | 10:30    | 10:45    | 11:00    |          |
| 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 |
| 7.83E-01 | 7.82E-01 | 7.82E-01 | 7.81E-01 | 7.81E-01 | 7.80E-01 | 7.80E-01 | 7.79E-01 | 7.79E-01 | 7.79E-01 | 7.79E-01 |
| 7.78E-02 | 7.78E-02 | 7.77E-02 | 7.77E-02 | 7.77E-02 | 7.77E-02 | 7.77E-02 | 7.76E-02 | 7.76E-02 | 7.76E-02 | 7.76E-02 |
| 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 |
| 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 |
| 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 |
| 1.46E+01 | 1.46E+01 | 1.46E+01 | 1.46E+01 | 1.46E+01 | 1.46E+01 | 1.45E+01 | 1.45E+01 | 1.45E+01 | 1.45E+01 | 1.45E+01 |
| 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 |
| 1.95E+01 | 1.95E+01 | 1.95E+01 | 1.95E+01 | 1.95E+01 | 1.94E+01 | 1.94E+01 | 1.94E+01 | 1.94E+01 | 1.94E+01 | 1.94E+01 |
| 5.32E-07 | 5.24E-07 | 5.18E-07 | 5.10E-07 | 5.05E-07 | 4.99E-07 | 4.93E-07 | 4.89E-07 | 4.83E-07 | 4.80E-07 | 4.80E-07 |
| 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 |
| 2.52E-01 | 2.55E-01 | 2.57E-01 | 2.59E-01 | 2.61E-01 | 2.64E-01 | 2.66E-01 | 2.68E-01 | 2.70E-01 | 2.72E-01 | 2.72E-01 |
| 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.10E-01 | 4.09E-01 | 4.09E-01 | 4.09E-01 | 4.09E-01 | 4.09E-01 | 4.09E-01 | 4.09E-01 |
| 3.98E-04 | 3.98E-04 | 3.97E-04 | 3.97E-04 | 3.97E-04 | 3.97E-04 | 3.96E-04 | 3.96E-04 | 3.96E-04 | 3.96E-04 | 3.95E-04 |
| 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 |
| 3.17E-03 | 3.16E-03 | 3.16E-03 | 3.16E-03 | 3.16E-03 | 3.16E-03 | 3.16E-03 | 3.15E-03 | 3.15E-03 | 3.15E-03 | 3.15E-03 |
| 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 |
| 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 |
| 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 |
| 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 |
| 2.71E+00 | 2.70E+00 | 2.70E+00 | 2.70E+00 | 2.70E+00 | 2.70E+00 | 2.70E+00 | 2.70E+00 | 2.70E+00 | 2.70E+00 | 2.70E+00 |
| 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.36E-01 | 3.36E-01 | 3.36E-01 | 3.36E-01 |
| 3.38E-01 | 3.38E-01 | 3.38E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 |
| 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 |
| 8.09E-07 | 8.07E-07 | 8.06E-07 | 8.05E-07 | 8.03E-07 | 8.02E-07 | 8.00E-07 | 7.98E-07 | 7.97E-07 | 7.96E-07 | 7.96E-07 |
| 2.82E+01 | 2.82E+01 | 2.82E+01 | 2.82E+01 | 2.82E+01 | 2.82E+01 | 2.82E+01 | 2.82E+01 | 2.82E+01 | 2.82E+01 | 2.82E+01 |
| 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 |
| 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 |
| 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 |
| 6.26E+00 | 6.26E+00 | 6.26E+00 | 6.26E+00 | 6.26E+00 | 6.25E+00 | 6.25E+00 | 6.25E+00 | 6.25E+00 | 6.25E+00 | 6.25E+00 |
| 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 |
| 4.30E-07 | 4.29E-07 | 4.28E-07 | 4.28E-07 | 4.27E-07 | 4.26E-07 | 4.25E-07 | 4.24E-07 | 4.23E-07 | 4.22E-07 | 4.22E-07 |
| 6.82E+00 | 6.82E+00 | 6.81E+00 | 6.81E+00 | 6.80E+00 | 6.80E+00 | 6.80E+00 | 6.80E+00 | 6.79E+00 | 6.79E+00 | 6.79E+00 |
| 4.70E-01 | 4.69E-01 | 4.69E-01 | 4.68E-01 | 4.67E-01 | 4.67E-01 | 4.66E-01 | 4.65E-01 | 4.64E-01 | 4.64E-01 | 4.64E-01 |
| 6.34E-11 | 6.31E-11 | 6.29E-11 | 6.27E-11 | 6.25E-11 | 6.23E-11 | 6.21E-11 | 6.19E-11 | 6.17E-11 | 6.15E-11 | 6.15E-11 |
| 9.27E+00 | 9.36E+00 | 9.45E+00 | 9.54E+00 | 9.63E+00 | 9.72E+00 | 9.81E+00 | 9.90E+00 | 9.99E+00 | 1.01E+01 | 1.01E+01 |
| 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 |
| 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.35E-01 | 2.34E-01 | 2.34E-01 | 2.34E-01 | 2.34E-01 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|
| 11:15    | 11:30    | 11:45    | 12:00    | 12:15    | 12:30    | 12:45    |
| 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 | 7.25E-04 |
| 7.79E-01 | 7.78E-01 | 7.78E-01 | 7.77E-01 | 7.77E-01 | 7.76E-01 | 7.76E-01 |
| 7.76E-02 | 7.76E-02 | 7.76E-02 | 7.75E-02 | 7.75E-02 | 7.75E-02 | 7.75E-02 |
| 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 |
| 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 | 1.30E-02 |
| 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 | 2.66E+04 |
| 1.45E+01 | 1.45E+01 | 1.45E+01 | 1.45E+01 | 1.45E+01 | 1.45E+01 | 1.45E+01 |
| 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 | 2.97E+04 |
| 1.94E+01 | 1.94E+01 | 1.94E+01 | 1.94E+01 | 1.94E+01 | 1.94E+01 | 1.93E+01 |
| 4.75E-07 | 4.71E-07 | 4.67E-07 | 4.64E-07 | 4.61E-07 | 4.57E-07 | 4.55E-07 |
| 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 | 7.88E+03 |
| 2.75E-01 | 2.76E-01 | 2.79E-01 | 2.81E-01 | 2.83E-01 | 2.85E-01 | 2.87E-01 |
| 4.09E-01 | 4.09E-01 | 4.09E-01 | 4.09E-01 | 4.09E-01 | 4.09E-01 | 4.09E-01 |
| 3.95E-04 | 3.95E-04 | 3.95E-04 | 3.94E-04 | 3.94E-04 | 3.94E-04 | 3.93E-04 |
| 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 | 6.53E-03 |
| 3.15E-03 | 3.15E-03 | 3.14E-03 | 3.14E-03 | 3.14E-03 | 3.14E-03 | 3.14E-03 |
| 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 | 5.96E-01 |
| 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 | 2.11E-04 |
| 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 | 7.48E-06 |
| 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 | 2.48E-01 |
| 2.69E+00 | 2.69E+00 | 2.69E+00 | 2.69E+00 | 2.69E+00 | 2.69E+00 | 2.69E+00 |
| 3.36E-01 | 3.36E-01 | 3.36E-01 | 3.36E-01 | 3.36E-01 | 3.36E-01 | 3.36E-01 |
| 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 | 3.37E-01 |
| 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 | 1.20E+00 |
| 7.94E-07 | 7.93E-07 | 7.91E-07 | 7.89E-07 | 7.88E-07 | 7.87E-07 | 7.85E-07 |
| 2.82E+01 | 2.82E+01 | 2.82E+01 | 2.82E+01 | 2.81E+01 | 2.81E+01 | 2.81E+01 |
| 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 | 4.37E+01 |
| 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 | 1.04E+01 |
| 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 | 1.07E+01 |
| 6.25E+00 | 6.25E+00 | 6.24E+00 | 6.24E+00 | 6.24E+00 | 6.24E+00 | 6.24E+00 |
| 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.63E+00 | 9.54E+00 | 9.54E+00 | 9.54E+00 |
| 4.21E-07 | 4.20E-07 | 4.19E-07 | 4.18E-07 | 4.17E-07 | 4.16E-07 | 4.15E-07 |
| 6.78E+00 | 6.78E+00 | 6.77E+00 | 6.77E+00 | 6.77E+00 | 6.76E+00 | 6.76E+00 |
| 4.64E-01 | 4.63E-01 | 4.63E-01 | 4.62E-01 | 4.61E-01 | 4.60E-01 | 4.60E-01 |
| 6.13E-11 | 6.11E-11 | 6.08E-11 | 6.07E-11 | 6.05E-11 | 6.03E-11 | 6.00E-11 |
| 1.02E+01 | 1.03E+01 | 1.04E+01 | 1.04E+01 | 1.05E+01 | 1.06E+01 | 1.07E+01 |
| 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 | 1.51E-01 |
| 2.34E-01 | 2.34E-01 | 2.34E-01 | 2.34E-01 | 2.34E-01 | 2.34E-01 | 2.34E-01 |



## Fukushima Unit 3 Spent Fuel Pool Case Summary

**Event Type** Spent Fuel

**Location**  
 Name: Fukushima Unit 3  
 City, county, state: <undefined>, <undefined>, <undefined>  
 Lat / Long / Elev: 37.4214° N, 141.0325° E, 0 m  
 UTC Offset: 9 hours  
 Population: not available

**Reactor Parameters**  
 Reactor power: 2350 MW(t)  
 Avg spent fuel burn-up: 50000 MWD / MTU  
 Assemblies in core: 550

**Source Term**  
 Type: Pool Storage - Uncovered Fuel  
 Shutdown for newest batch: 2010/12/01  
 Batches in pool: 3  
 Fuel uncovered: 2011/03/14 11:00  
 Fuel recovered: No

**Release Pathway**  
 Type: From Spent Fuel Drained Pool  
 Release height: 10. m

Release timings  
 To atmosphere start: 2011/03/14 13:00

Filtered: No

**Meteorology**  
 Type: Actual Observations  
 Dataset name: Fukushima 2011-03-16 0935  
 Dataset desc: Obs/fcsts for Fukushima Unit 1

| Summary of data<br>at release point: | Type | Dir<br>deg | Speed<br>m/s | Stab<br>class | Precip | Temp<br>°C |
|--------------------------------------|------|------------|--------------|---------------|--------|------------|
| 2011/03/12 14:00                     | Obs  | 265        | 1.0          | B             | ?      |            |
| 2011/03/12 15:00                     | Obs  | 265        | 1.0          | B             | ?      |            |
| 2011/03/12 16:00                     | Obs  | 277        | 1.3          | B             | ?      |            |
| 2011/03/12 17:00                     | Obs  | 260        | 2.4          | B             | ?      |            |
| 2011/03/12 18:00                     | Obs  | 241        | 1.4          | E             | ?      |            |
| 2011/03/12 19:00                     | Obs  | 236        | 2.1          | E             | ?      |            |
| 2011/03/12 20:00                     | Obs  | 239        | 2.1          | E             | ?      |            |
| 2011/03/12 21:00                     | Obs  | 229        | 3.8          | E             | ?      |            |
| 2011/03/12 22:00                     | Obs  | 224        | 5.1          | E             | ?      |            |
| 2011/03/12 23:00                     | Obs  | 226        | 3.9          | E             | ?      |            |
| 2011/03/13 00:00                     | Obs  | 228        | 4.1          | E             | ?      |            |
| 2011/03/13 01:00                     | Obs  | 235        | 2.6          | E             | ?      |            |
| 2011/03/13 02:00                     | Obs  | 233        | 3.9          | E             | ?      |            |
| 2011/03/13 03:00                     | Obs  | 225        | 1.8          | E             | ?      |            |
| 2011/03/13 04:00                     | Obs  | 225        | 1.3          | E             | ?      |            |

|                  |      |     |      |     |          |
|------------------|------|-----|------|-----|----------|
| 2011/03/13 05:00 | Obs  | 225 | 2.2  | E   | ?        |
| 2011/03/13 06:00 | Obs  | 225 | 2.2  | E   | ?        |
| 2011/03/13 07:00 | Obs  | 248 | 2.7  | E   | ?        |
| 2011/03/13 08:00 | Obs  | 248 | 2.7  | E   | ?        |
| 2011/03/13 09:00 | Obs  | 270 | 3.1  | E   | ?        |
| 2011/03/13 12:00 | Obs  | 271 | 7.4  | D   | ?        |
| 2011/03/13 13:00 | Obs  | 276 | 6.2  | D   | ?        |
| 2011/03/13 14:00 | Obs  | 312 | 2.8  | B   | ?        |
| 2011/03/14 18:00 | Obs  | 258 | 4.8  | unk | ?        |
| 2011/03/14 19:00 | Obs  | 268 | 5.0  | unk | ?        |
| 2011/03/14 20:00 | Obs  | 330 | 2.2  | unk | ?        |
| 2011/03/14 21:00 | Fcst | 337 | 4.6  | unk | ?        |
| 2011/03/14 22:00 | Fcst | 323 | 7.2  | unk | ?        |
| 2011/03/14 23:00 | Fcst | 305 | 6.6  | unk | ?        |
| 2011/03/15 00:00 | Fcst | 015 | 8.6  | unk | ?        |
| 2011/03/15 02:00 | Fcst | 002 | 7.5  | unk | ?        |
| 2011/03/15 03:00 | Fcst | 347 | 5.2  | E   | None     |
| 2011/03/15 04:00 | Fcst | 332 | 5.6  | E   | None     |
| 2011/03/15 05:00 | Fcst | 332 | 4.0  | E   | None     |
| 2011/03/15 06:00 | Fcst | 344 | 3.5  | E   | Lgt rain |
| 2011/03/15 07:00 | Fcst | 026 | 3.8  | E   | Lgt rain |
| 2011/03/15 08:00 | Fcst | 044 | 4.4  | E   | Lgt rain |
| 2011/03/15 09:00 | Fcst | 020 | 4.2  | E   | Lgt rain |
| 2011/03/15 10:00 | Fcst | 010 | 3.4  | E   | None     |
| 2011/03/15 11:00 | Fcst | 030 | 3.5  | D   | Lgt rain |
| 2011/03/15 12:00 | Fcst | 027 | 3.0  | D   | Lgt rain |
| 2011/03/15 13:00 | Fcst | 037 | 3.4  | D   | Lgt rain |
| 2011/03/15 14:00 | Fcst | 053 | 3.7  | B   | None     |
| 2011/03/15 15:00 | Fcst | 058 | 3.7  | B   | None     |
| 2011/03/15 16:00 | Fcst | 067 | 3.2  | C   | Lgt rain |
| 2011/03/15 17:00 | Fcst | 081 | 3.9  | C   | Lgt rain |
| 2011/03/15 18:00 | Fcst | 089 | 4.7  | B   | None     |
| 2011/03/15 19:00 | Fcst | 085 | 4.4  | B   | None     |
| 2011/03/15 20:00 | Fcst | 083 | 4.4  | B   | Lgt rain |
| 2011/03/15 21:00 | Fcst | 074 | 4.6  | C   | Lgt rain |
| 2011/03/15 22:00 | Fcst | 054 | 5.0  | D   | Lgt rain |
| 2011/03/15 23:00 | Fcst | 029 | 5.6  | D   | Rain     |
| 2011/03/16 00:00 | Fcst | 011 | 5.1  | D   | Lgt rain |
| 2011/03/16 01:00 | Fcst | 346 | 4.3  | C   | Lgt rain |
| 2011/03/16 02:00 | Fcst | 350 | 5.3  | D   | Lgt rain |
| 2011/03/16 03:00 | Fcst | 323 | 5.6  | D   | Lgt rain |
| 2011/03/16 04:00 | Fcst | 316 | 5.4  | D   | None     |
| 2011/03/16 05:00 | Fcst | 298 | 4.8  | D   | None     |
| 2011/03/16 06:00 | Fcst | 314 | 5.6  | D   | None     |
| 2011/03/16 07:00 | Fcst | 312 | 4.7  | D   | None     |
| 2011/03/16 08:00 | Fcst | 331 | 4.9  | D   | None     |
| 2011/03/16 09:00 | Fcst | 299 | 4.2  | D   | None     |
| 2011/03/16 10:00 | Fcst | 312 | 5.4  | C   | None     |
| 2011/03/16 11:00 | Fcst | 309 | 7.5  | C   | None     |
| 2011/03/16 12:00 | Fcst | 304 | 7.2  | C   | None     |
| 2011/03/16 13:00 | Fcst | 314 | 8.8  | C   | None     |
| 2011/03/16 14:00 | Fcst | 325 | 10.4 | C   | None     |
| 2011/03/16 15:00 | Fcst | 324 | 12.3 | C   | None     |
| 2011/03/16 16:00 | Fcst | 304 | 14.7 | D   | None     |
| 2011/03/16 17:00 | Fcst | 299 | 14.2 | D   | None     |
| 2011/03/16 18:00 | Fcst | 297 | 11.3 | D   | None     |

|                  |      |     |      |   |      |
|------------------|------|-----|------|---|------|
| 2011/03/16 19:00 | Fcst | 316 | 9.8  | D | None |
| 2011/03/16 20:00 | Fcst | 309 | 9.4  | D | None |
| 2011/03/16 21:00 | Fcst | 294 | 9.5  | D | None |
| 2011/03/16 22:00 | Fcst | 299 | 7.6  | D | None |
| 2011/03/16 23:00 | Fcst | 300 | 9.7  | D | None |
| 2011/03/17 00:00 | Fcst | 294 | 5.0  | D | None |
| 2011/03/17 01:00 | Fcst | 286 | 7.0  | D | None |
| 2011/03/17 02:00 | Fcst | 287 | 6.6  | D | None |
| 2011/03/17 03:00 | Fcst | 293 | 6.5  | D | None |
| 2011/03/17 04:00 | Fcst | 300 | 6.3  | D | None |
| 2011/03/17 05:00 | Fcst | 311 | 5.9  | D | None |
| 2011/03/17 06:00 | Fcst | 295 | 7.4  | D | None |
| 2011/03/17 07:00 | Fcst | 303 | 8.4  | C | None |
| 2011/03/17 08:00 | Fcst | 333 | 4.8  | C | None |
| 2011/03/17 09:00 | Fcst | 321 | 5.9  | C | None |
| 2011/03/17 10:00 | Fcst | 307 | 5.0  | C | None |
| 2011/03/17 11:00 | Fcst | 292 | 8.4  | C | None |
| 2011/03/17 12:00 | Fcst | 315 | 9.3  | C | None |
| 2011/03/17 13:00 | Fcst | 299 | 11.1 | C | None |
| 2011/03/17 14:00 | Fcst | 292 | 11.8 | C | None |
| 2011/03/17 15:00 | Fcst | 286 | 10.7 | C | None |
| 2011/03/17 16:00 | Fcst | 298 | 9.3  | D | None |
| 2011/03/17 17:00 | Fcst | 286 | 8.5  | D | None |
| 2011/03/17 18:00 | Fcst | 285 | 10.6 | D | None |
| 2011/03/17 19:00 | Fcst | 288 | 11.1 | D | None |
| 2011/03/17 20:00 | Fcst | 301 | 11.3 | D | None |
| 2011/03/17 21:00 | Fcst | 311 | 10.1 | D | None |
| 2011/03/17 22:00 | Fcst | 307 | 8.4  | D | None |
| 2011/03/17 23:00 | Fcst | 303 | 8.7  | D | None |
| 2011/03/18 00:00 | Fcst | 311 | 7.1  | D | None |
| 2011/03/18 01:00 | Fcst | 316 | 3.4  | D | None |
| 2011/03/18 02:00 | Fcst | 310 | 6.0  | D | None |
| 2011/03/18 03:00 | Fcst | 319 | 7.4  | D | None |
| 2011/03/18 04:00 | Fcst | 316 | 6.3  | D | None |
| 2011/03/18 05:00 | Fcst | 307 | 4.9  | D | None |
| 2011/03/18 06:00 | Fcst | 311 | 4.4  | D | None |
| 2011/03/18 07:00 | Fcst | 326 | 5.1  | C | None |
| 2011/03/18 08:00 | Fcst | 343 | 5.4  | C | None |
| 2011/03/18 09:00 | Fcst | 344 | 6.1  | C | None |

Dataset options:

Est. missing stability using: Wind speed, time of day, etc.  
 Adjust stability for consistency: No  
 Modify winds for topography: Yes

#### Calculations

Case description:

Fukushima Unit 3 spent fuel pool

End of calculations:

2011/03/15 13:00

Start of release to atmosphere + 24 h

Distance of calculation:

Close-in + to 50 miles

Close-in distances:

0.5, 1.0, 1.5, 2.0, 3.0, 5.0, 7.0, 10.0 miles

RASCAL v4.1.0 Source Term

File created: 2011/03/16 11:48

Case name: U4 Fukushima approximate full SFP release

Radionuclide units: Ci

| Interval | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Start    | 19:50    | 20:05    | 20:20    | 20:35    | 20:50    | 21:05    | 21:20    | 21:35    | 21:50    |
| Am-241   | 0.00E+00 | 0.00E+00 | 3.69E-02 | 5.74E-02 | 6.89E-02 | 7.52E-02 | 7.88E-02 | 8.07E-02 | 5.82E-01 |
| Ba-140   | 0.00E+00 | 0.00E+00 | 2.14E+02 | 3.33E+02 | 3.99E+02 | 4.35E+02 | 4.55E+02 | 4.66E+02 | 9.09E+02 |
| Ce-141   | 0.00E+00 | 0.00E+00 | 1.67E+02 | 2.60E+02 | 3.12E+02 | 3.40E+02 | 3.56E+02 | 3.65E+02 | 1.20E+03 |
| Ce-144   | 0.00E+00 | 0.00E+00 | 9.90E+02 | 1.54E+03 | 1.85E+03 | 2.02E+03 | 2.12E+03 | 2.17E+03 | 7.08E+03 |
| Cm-242   | 0.00E+00 | 0.00E+00 | 1.04E+01 | 1.61E+01 | 1.94E+01 | 2.11E+01 | 2.21E+01 | 2.26E+01 | 1.63E+02 |
| Cs-134   | 6.01E+04 | 9.36E+04 | 1.32E+05 | 1.54E+05 | 1.66E+05 | 1.72E+05 | 1.76E+05 | 1.78E+05 | 1.94E+05 |
| Cs-136   | 5.99E+01 | 9.36E+01 | 1.31E+02 | 1.53E+02 | 1.65E+02 | 1.71E+02 | 1.75E+02 | 1.76E+02 | 1.93E+02 |
| Cs-137   | 4.55E+04 | 7.08E+04 | 9.99E+04 | 1.16E+05 | 1.25E+05 | 1.31E+05 | 1.33E+05 | 1.35E+05 | 1.47E+05 |
| I-131    | 3.29E+01 | 5.11E+01 | 8.31E+01 | 1.01E+02 | 1.11E+02 | 1.16E+02 | 1.19E+02 | 1.21E+02 | 1.14E+02 |
| I-132    | 7.22E-05 | 1.10E-04 | 1.76E-04 | 2.13E-04 | 2.33E-04 | 2.45E-04 | 2.52E-04 | 2.57E-04 | 2.44E-04 |
| Kr-85    | 5.19E+03 | 9.09E+03 | 3.97E+04 | 6.26E+04 | 7.99E+04 | 9.27E+04 | 1.03E+05 | 1.10E+05 | 8.24E+04 |
| La-140   | 0.00E+00 | 0.00E+00 | 2.47E+00 | 4.34E+00 | 5.65E+00 | 6.54E+00 | 7.11E+00 | 7.48E+00 | 4.13E+01 |
| Mo-99    | 0.00E+00 | 0.00E+00 | 2.31E-08 | 3.59E-08 | 4.29E-08 | 4.68E-08 | 4.89E-08 | 5.00E-08 | 4.49E-08 |
| Nb-95    | 0.00E+00 | 0.00E+00 | 3.58E+02 | 5.57E+02 | 6.68E+02 | 7.29E+02 | 7.63E+02 | 7.81E+02 | 5.64E+03 |
| Nd-147   | 0.00E+00 | 0.00E+00 | 3.22E-01 | 5.00E-01 | 5.99E-01 | 6.54E-01 | 6.85E-01 | 7.01E-01 | 5.06E+00 |
| Np-239   | 0.00E+00 | 0.00E+00 | 6.51E-10 | 1.01E-09 | 1.21E-09 | 1.31E-09 | 1.37E-09 | 1.40E-09 | 4.56E-09 |
| Pm-147   | 0.00E+00 | 0.00E+00 | 2.73E+00 | 4.24E+00 | 5.09E+00 | 5.55E+00 | 5.81E+00 | 5.96E+00 | 4.30E+01 |
| Pr-143   | 0.00E+00 | 0.00E+00 | 2.61E+00 | 4.06E+00 | 4.86E+00 | 5.30E+00 | 5.54E+00 | 5.68E+00 | 4.10E+01 |
| Pr-144   | 0.00E+00 | 0.00E+00 | 3.97E+02 | 7.67E+02 | 1.02E+03 | 1.17E+03 | 1.26E+03 | 1.31E+03 | 6.79E+03 |
| Pu-238   | 0.00E+00 | 0.00E+00 | 7.49E-02 | 1.16E-01 | 1.40E-01 | 1.52E-01 | 1.59E-01 | 1.64E-01 | 5.36E-01 |
| Pu-239   | 0.00E+00 | 0.00E+00 | 5.54E-03 | 8.62E-03 | 1.04E-02 | 1.13E-02 | 1.18E-02 | 1.21E-02 | 3.96E-02 |
| Pu-241   | 0.00E+00 | 0.00E+00 | 1.97E+02 | 3.07E+02 | 3.68E+02 | 4.02E+02 | 4.21E+02 | 4.31E+02 | 1.41E+03 |
| Rb-86    | 1.14E+01 | 1.77E+01 | 2.50E+01 | 2.91E+01 | 3.13E+01 | 3.26E+01 | 3.32E+01 | 3.36E+01 | 3.67E+01 |
| Rh-103m  | 0.00E+00 | 0.00E+00 | 1.22E+03 | 1.89E+03 | 2.26E+03 | 2.48E+03 | 2.58E+03 | 2.65E+03 | 2.39E+03 |
| Ru-103   | 0.00E+00 | 0.00E+00 | 1.22E+03 | 1.89E+03 | 2.27E+03 | 2.48E+03 | 2.59E+03 | 2.66E+03 | 2.39E+03 |
| Ru-106   | 0.00E+00 | 0.00E+00 | 2.99E+03 | 4.64E+03 | 5.56E+03 | 6.08E+03 | 6.36E+03 | 6.52E+03 | 5.88E+03 |
| Sb-127   | 0.00E+00 | 0.00E+00 | 4.59E-05 | 7.13E-05 | 8.52E-05 | 9.27E-05 | 9.72E-05 | 9.90E-05 | 1.94E-04 |
| Sr-89    | 0.00E+00 | 0.00E+00 | 8.18E+03 | 1.27E+04 | 1.52E+04 | 1.67E+04 | 1.75E+04 | 1.78E+04 | 3.49E+04 |
| Sr-90    | 0.00E+00 | 0.00E+00 | 4.46E+03 | 6.94E+03 | 8.32E+03 | 9.09E+03 | 9.54E+03 | 9.72E+03 | 1.91E+04 |
| Tc-99m   | 0.00E+00 | 0.00E+00 | 2.23E-08 | 3.47E-08 | 4.14E-08 | 4.51E-08 | 4.71E-08 | 4.82E-08 | 4.33E-08 |
| Te-127   | 0.00E+00 | 0.00E+00 | 7.21E+02 | 1.13E+03 | 1.34E+03 | 1.47E+03 | 1.54E+03 | 1.58E+03 | 3.09E+03 |
| Te-127m  | 0.00E+00 | 0.00E+00 | 7.63E+02 | 1.19E+03 | 1.42E+03 | 1.56E+03 | 1.63E+03 | 1.67E+03 | 3.26E+03 |
| Te-129   | 0.00E+00 | 0.00E+00 | 4.50E+02 | 6.99E+02 | 8.38E+02 | 9.18E+02 | 9.54E+02 | 9.81E+02 | 1.92E+03 |
| Te-129m  | 0.00E+00 | 0.00E+00 | 6.90E+02 | 1.07E+03 | 1.29E+03 | 1.40E+03 | 1.47E+03 | 1.50E+03 | 2.94E+03 |
| Te-132   | 0.00E+00 | 0.00E+00 | 2.32E-05 | 3.61E-05 | 4.32E-05 | 4.71E-05 | 4.91E-05 | 5.02E-05 | 9.81E-05 |
| Xe-131m  | 1.13E+01 | 1.97E+01 | 8.61E+01 | 1.36E+02 | 1.73E+02 | 2.01E+02 | 2.21E+02 | 2.38E+02 | 1.78E+02 |
| Xe-133   | 6.98E-01 | 1.22E+00 | 5.32E+00 | 8.38E+00 | 1.07E+01 | 1.24E+01 | 1.37E+01 | 1.46E+01 | 1.09E+01 |
| Xe-133m  | 7.17E-11 | 1.25E-10 | 5.45E-10 | 8.58E-10 | 1.09E-09 | 1.26E-09 | 1.39E-09 | 1.49E-09 | 1.11E-09 |
| Y-90     | 0.00E+00 | 0.00E+00 | 4.46E+01 | 7.61E+01 | 9.72E+01 | 1.11E+02 | 1.20E+02 | 1.25E+02 | 7.38E+02 |
| Y-91     | 0.00E+00 | 0.00E+00 | 1.32E+02 | 2.05E+02 | 2.47E+02 | 2.69E+02 | 2.82E+02 | 2.88E+02 | 2.08E+03 |
| Zr-95    | 0.00E+00 | 0.00E+00 | 2.04E+02 | 3.19E+02 | 3.82E+02 | 4.17E+02 | 4.36E+02 | 4.46E+02 | 3.22E+03 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 22:05    | 22:20    | 22:35    | 22:50    | 23:05    | 23:20    | 23:35    | 23:50    | 0:05     | 0:20     |
| 1.02E+00 | 1.34E+00 | 1.57E+00 | 1.74E+00 | 1.85E+00 | 1.94E+00 | 2.00E+00 | 2.04E+00 | 2.08E+00 | 2.11E+00 |
| 1.35E+03 | 1.67E+03 | 1.90E+03 | 2.06E+03 | 2.18E+03 | 2.26E+03 | 2.32E+03 | 2.37E+03 | 2.40E+03 | 2.42E+03 |
| 1.95E+03 | 2.49E+03 | 2.89E+03 | 3.17E+03 | 3.38E+03 | 3.53E+03 | 3.63E+03 | 3.71E+03 | 3.76E+03 | 3.80E+03 |
| 1.15E+04 | 1.48E+04 | 1.71E+04 | 1.88E+04 | 2.01E+04 | 2.09E+04 | 2.16E+04 | 2.21E+04 | 2.23E+04 | 2.26E+04 |
| 2.86E+02 | 3.75E+02 | 4.39E+02 | 4.86E+02 | 5.19E+02 | 5.44E+02 | 5.61E+02 | 5.73E+02 | 5.82E+02 | 5.89E+02 |
| 2.31E+05 | 2.58E+05 | 2.78E+05 | 2.92E+05 | 3.02E+05 | 3.10E+05 | 3.15E+05 | 3.19E+05 | 3.21E+05 | 3.23E+05 |
| 2.30E+02 | 2.57E+02 | 2.75E+02 | 2.90E+02 | 3.00E+02 | 3.06E+02 | 3.11E+02 | 3.15E+02 | 3.18E+02 | 3.20E+02 |
| 1.76E+05 | 1.95E+05 | 2.11E+05 | 2.21E+05 | 2.29E+05 | 2.34E+05 | 2.39E+05 | 2.41E+05 | 2.43E+05 | 2.45E+05 |
| 1.25E+02 | 1.32E+02 | 1.38E+02 | 1.42E+02 | 1.45E+02 | 1.47E+02 | 1.48E+02 | 1.49E+02 | 1.49E+02 | 1.50E+02 |
| 2.70E-04 | 2.92E-04 | 3.10E-04 | 3.25E-04 | 3.38E-04 | 3.48E-04 | 3.58E-04 | 3.66E-04 | 3.74E-04 | 3.83E-04 |
| 6.17E+04 | 4.63E+04 | 3.47E+04 | 2.60E+04 | 1.95E+04 | 1.47E+04 | 1.10E+04 | 8.24E+03 | 6.18E+03 | 4.64E+03 |
| 7.25E+01 | 9.63E+01 | 1.14E+02 | 1.28E+02 | 1.38E+02 | 1.46E+02 | 1.51E+02 | 1.56E+02 | 1.59E+02 | 1.61E+02 |
| 4.72E-08 | 4.87E-08 | 4.98E-08 | 5.06E-08 | 5.10E-08 | 5.14E-08 | 5.16E-08 | 5.17E-08 | 5.17E-08 | 5.17E-08 |
| 9.90E+03 | 1.30E+04 | 1.52E+04 | 1.67E+04 | 1.79E+04 | 1.88E+04 | 1.94E+04 | 1.98E+04 | 2.01E+04 | 2.03E+04 |
| 8.87E+00 | 1.16E+01 | 1.36E+01 | 1.50E+01 | 1.60E+01 | 1.67E+01 | 1.73E+01 | 1.76E+01 | 1.79E+01 | 1.81E+01 |
| 7.43E-09 | 9.45E-09 | 1.10E-08 | 1.20E-08 | 1.27E-08 | 1.32E-08 | 1.36E-08 | 1.39E-08 | 1.40E-08 | 1.41E-08 |
| 7.54E+01 | 9.90E+01 | 1.16E+02 | 1.28E+02 | 1.37E+02 | 1.43E+02 | 1.48E+02 | 1.51E+02 | 1.53E+02 | 1.55E+02 |
| 7.18E+01 | 9.45E+01 | 1.10E+02 | 1.22E+02 | 1.30E+02 | 1.36E+02 | 1.40E+02 | 1.43E+02 | 1.46E+02 | 1.47E+02 |
| 1.14E+04 | 1.48E+04 | 1.71E+04 | 1.88E+04 | 2.01E+04 | 2.09E+04 | 2.16E+04 | 2.21E+04 | 2.23E+04 | 2.26E+04 |
| 8.74E-01 | 1.12E+00 | 1.30E+00 | 1.42E+00 | 1.51E+00 | 1.58E+00 | 1.63E+00 | 1.67E+00 | 1.69E+00 | 1.71E+00 |
| 6.46E-02 | 8.27E-02 | 9.54E-02 | 1.05E-01 | 1.12E-01 | 1.17E-01 | 1.21E-01 | 1.23E-01 | 1.25E-01 | 1.26E-01 |
| 2.30E+03 | 2.94E+03 | 3.41E+03 | 3.75E+03 | 4.00E+03 | 4.17E+03 | 4.29E+03 | 4.38E+03 | 4.46E+03 | 4.50E+03 |
| 4.37E+01 | 4.88E+01 | 5.25E+01 | 5.51E+01 | 5.70E+01 | 5.83E+01 | 5.93E+01 | 5.99E+01 | 6.05E+01 | 6.08E+01 |
| 2.51E+03 | 2.60E+03 | 2.67E+03 | 2.72E+03 | 2.75E+03 | 2.77E+03 | 2.79E+03 | 2.80E+03 | 2.81E+03 | 2.82E+03 |
| 2.52E+03 | 2.61E+03 | 2.67E+03 | 2.72E+03 | 2.75E+03 | 2.78E+03 | 2.80E+03 | 2.81E+03 | 2.82E+03 | 2.83E+03 |
| 6.18E+03 | 6.41E+03 | 6.57E+03 | 6.69E+03 | 6.77E+03 | 6.83E+03 | 6.88E+03 | 6.90E+03 | 6.93E+03 | 6.94E+03 |
| 2.87E-04 | 3.54E-04 | 4.02E-04 | 4.37E-04 | 4.61E-04 | 4.78E-04 | 4.91E-04 | 4.99E-04 | 5.05E-04 | 5.09E-04 |
| 5.18E+04 | 6.39E+04 | 7.27E+04 | 7.91E+04 | 8.37E+04 | 8.69E+04 | 8.94E+04 | 9.09E+04 | 9.27E+04 | 9.36E+04 |
| 2.83E+04 | 3.49E+04 | 3.97E+04 | 4.32E+04 | 4.57E+04 | 4.75E+04 | 4.89E+04 | 4.98E+04 | 5.05E+04 | 5.09E+04 |
| 4.55E-08 | 4.70E-08 | 4.80E-08 | 4.87E-08 | 4.92E-08 | 4.95E-08 | 4.97E-08 | 4.98E-08 | 4.99E-08 | 4.99E-08 |
| 4.58E+03 | 5.66E+03 | 6.45E+03 | 7.02E+03 | 7.43E+03 | 7.72E+03 | 7.94E+03 | 8.10E+03 | 8.22E+03 | 8.30E+03 |
| 4.83E+03 | 5.97E+03 | 6.80E+03 | 7.38E+03 | 7.81E+03 | 8.12E+03 | 8.34E+03 | 8.51E+03 | 8.62E+03 | 8.70E+03 |
| 2.84E+03 | 3.51E+03 | 4.00E+03 | 4.35E+03 | 4.60E+03 | 4.78E+03 | 4.91E+03 | 5.00E+03 | 5.07E+03 | 5.12E+03 |
| 4.37E+03 | 5.40E+03 | 6.14E+03 | 6.67E+03 | 7.06E+03 | 7.34E+03 | 7.54E+03 | 7.69E+03 | 7.79E+03 | 7.86E+03 |
| 1.45E-04 | 1.79E-04 | 2.03E-04 | 2.21E-04 | 2.32E-04 | 2.41E-04 | 2.48E-04 | 2.51E-04 | 2.55E-04 | 2.57E-04 |
| 1.33E+02 | 9.99E+01 | 7.49E+01 | 5.62E+01 | 4.21E+01 | 3.16E+01 | 2.37E+01 | 1.77E+01 | 1.33E+01 | 9.99E+00 |
| 8.19E+00 | 6.14E+00 | 4.59E+00 | 3.44E+00 | 2.57E+00 | 1.93E+00 | 1.45E+00 | 1.08E+00 | 8.11E-01 | 6.08E-01 |
| 8.28E-10 | 6.19E-10 | 4.63E-10 | 3.46E-10 | 2.58E-10 | 1.94E-10 | 1.45E-10 | 1.08E-10 | 8.07E-11 | 6.04E-11 |
| 1.30E+03 | 1.71E+03 | 2.03E+03 | 2.26E+03 | 2.44E+03 | 2.57E+03 | 2.67E+03 | 2.75E+03 | 2.80E+03 | 2.84E+03 |
| 3.65E+03 | 4.78E+03 | 5.60E+03 | 6.18E+03 | 6.62E+03 | 6.92E+03 | 7.14E+03 | 7.30E+03 | 7.42E+03 | 7.50E+03 |
| 5.65E+03 | 7.41E+03 | 8.68E+03 | 9.63E+03 | 1.03E+04 | 1.07E+04 | 1.11E+04 | 1.13E+04 | 1.15E+04 | 1.16E+04 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0:35     | 0:50     | 1:05     | 1:20     | 1:35     | 1:50     | 2:05     | 2:20     | 2:35     | 2:50     |
| 2.12E+00 | 1.53E+00 | 1.11E+00 | 8.00E-01 | 5.78E-01 | 4.18E-01 | 3.02E-01 | 2.18E-01 | 1.58E-01 | 1.13E-01 |
| 2.44E+03 | 1.76E+03 | 1.27E+03 | 9.18E+02 | 6.62E+02 | 4.78E+02 | 3.45E+02 | 2.49E+02 | 1.80E+02 | 1.30E+02 |
| 3.83E+03 | 2.76E+03 | 2.00E+03 | 1.44E+03 | 1.04E+03 | 7.52E+02 | 5.44E+02 | 3.92E+02 | 2.84E+02 | 2.05E+02 |
| 2.28E+04 | 1.65E+04 | 1.19E+04 | 8.58E+03 | 6.20E+03 | 4.47E+03 | 3.23E+03 | 2.34E+03 | 1.69E+03 | 1.22E+03 |
| 5.94E+02 | 4.28E+02 | 3.10E+02 | 2.24E+02 | 1.62E+02 | 1.17E+02 | 8.43E+01 | 6.09E+01 | 4.40E+01 | 3.18E+01 |
| 3.25E+05 | 2.35E+05 | 1.69E+05 | 1.22E+05 | 8.84E+04 | 6.39E+04 | 4.62E+04 | 3.33E+04 | 2.41E+04 | 1.74E+04 |
| 3.20E+02 | 2.31E+02 | 1.67E+02 | 1.21E+02 | 8.71E+01 | 6.29E+01 | 4.55E+01 | 3.28E+01 | 2.37E+01 | 1.71E+01 |
| 2.46E+05 | 1.77E+05 | 1.29E+05 | 9.27E+04 | 6.70E+04 | 4.83E+04 | 3.49E+04 | 2.52E+04 | 1.83E+04 | 1.31E+04 |
| 1.50E+02 | 1.09E+02 | 7.83E+01 | 5.65E+01 | 4.08E+01 | 2.94E+01 | 2.12E+01 | 1.53E+01 | 1.11E+01 | 7.98E+00 |
| 3.90E-04 | 2.75E-04 | 1.94E-04 | 1.37E-04 | 9.63E-05 | 6.84E-05 | 4.84E-05 | 3.44E-05 | 2.44E-05 | 1.73E-05 |
| 3.47E+03 | 2.61E+03 | 1.95E+03 | 1.47E+03 | 1.10E+03 | 8.25E+02 | 6.19E+02 | 4.64E+02 | 3.48E+02 | 2.61E+02 |
| 1.63E+02 | 1.25E+02 | 9.54E+01 | 7.25E+01 | 5.50E+01 | 4.16E+01 | 3.14E+01 | 2.37E+01 | 1.78E+01 | 1.33E+01 |
| 5.17E-08 | 3.72E-08 | 2.68E-08 | 1.94E-08 | 1.40E-08 | 9.99E-09 | 7.23E-09 | 5.20E-09 | 3.75E-09 | 2.70E-09 |
| 2.05E+04 | 1.49E+04 | 1.07E+04 | 7.73E+03 | 5.58E+03 | 4.03E+03 | 2.92E+03 | 2.11E+03 | 1.52E+03 | 1.10E+03 |
| 1.83E+01 | 1.32E+01 | 9.54E+00 | 6.88E+00 | 4.96E+00 | 3.58E+00 | 2.58E+00 | 1.86E+00 | 1.35E+00 | 9.72E-01 |
| 1.42E-08 | 1.02E-08 | 7.35E-09 | 5.30E-09 | 3.82E-09 | 2.75E-09 | 1.98E-09 | 1.42E-09 | 1.03E-09 | 7.39E-10 |
| 1.57E+02 | 1.13E+02 | 8.16E+01 | 5.90E+01 | 4.26E+01 | 3.08E+01 | 2.22E+01 | 1.60E+01 | 1.16E+01 | 8.38E+00 |
| 1.49E+02 | 1.07E+02 | 7.73E+01 | 5.58E+01 | 4.03E+01 | 2.91E+01 | 2.10E+01 | 1.51E+01 | 1.10E+01 | 7.90E+00 |
| 2.28E+04 | 1.65E+04 | 1.19E+04 | 8.58E+03 | 6.20E+03 | 4.47E+03 | 3.23E+03 | 2.34E+03 | 1.69E+03 | 1.22E+03 |
| 1.72E+00 | 1.24E+00 | 8.99E-01 | 6.50E-01 | 4.69E-01 | 3.39E-01 | 2.45E-01 | 1.77E-01 | 1.28E-01 | 9.27E-02 |
| 1.27E-01 | 9.18E-02 | 6.64E-02 | 4.80E-02 | 3.47E-02 | 2.50E-02 | 1.81E-02 | 1.31E-02 | 9.45E-03 | 6.81E-03 |
| 4.54E+03 | 3.28E+03 | 2.37E+03 | 1.71E+03 | 1.23E+03 | 8.92E+02 | 6.44E+02 | 4.65E+02 | 3.37E+02 | 2.43E+02 |
| 6.11E+01 | 4.41E+01 | 3.19E+01 | 2.30E+01 | 1.67E+01 | 1.20E+01 | 8.66E+00 | 6.26E+00 | 4.52E+00 | 3.26E+00 |
| 2.83E+03 | 2.04E+03 | 1.48E+03 | 1.06E+03 | 7.68E+02 | 5.54E+02 | 4.01E+02 | 2.90E+02 | 2.09E+02 | 1.51E+02 |
| 2.83E+03 | 2.04E+03 | 1.48E+03 | 1.06E+03 | 7.70E+02 | 5.56E+02 | 4.01E+02 | 2.90E+02 | 2.10E+02 | 1.51E+02 |
| 6.96E+03 | 5.02E+03 | 3.63E+03 | 2.62E+03 | 1.89E+03 | 1.37E+03 | 9.90E+02 | 7.14E+02 | 5.16E+02 | 3.73E+02 |
| 5.11E-04 | 3.69E-04 | 2.66E-04 | 1.92E-04 | 1.39E-04 | 9.99E-05 | 7.18E-05 | 5.18E-05 | 3.74E-05 | 2.69E-05 |
| 9.36E+04 | 6.78E+04 | 4.90E+04 | 3.54E+04 | 2.56E+04 | 1.85E+04 | 1.33E+04 | 9.63E+03 | 6.95E+03 | 5.02E+03 |
| 5.13E+04 | 3.71E+04 | 2.68E+04 | 1.94E+04 | 1.40E+04 | 1.01E+04 | 7.29E+03 | 5.27E+03 | 3.81E+03 | 2.75E+03 |
| 4.98E-08 | 3.59E-08 | 2.58E-08 | 1.86E-08 | 1.34E-08 | 9.63E-09 | 6.97E-09 | 5.02E-09 | 3.62E-09 | 2.60E-09 |
| 8.36E+03 | 6.04E+03 | 4.37E+03 | 3.16E+03 | 2.28E+03 | 1.65E+03 | 1.19E+03 | 8.60E+02 | 6.22E+02 | 4.49E+02 |
| 8.77E+03 | 6.34E+03 | 4.57E+03 | 3.30E+03 | 2.39E+03 | 1.73E+03 | 1.24E+03 | 8.99E+02 | 6.50E+02 | 4.70E+02 |
| 5.15E+03 | 3.72E+03 | 2.69E+03 | 1.94E+03 | 1.40E+03 | 1.01E+03 | 7.31E+02 | 5.28E+02 | 3.82E+02 | 2.75E+02 |
| 7.91E+03 | 5.72E+03 | 4.13E+03 | 2.98E+03 | 2.15E+03 | 1.56E+03 | 1.13E+03 | 8.11E+02 | 5.86E+02 | 4.23E+02 |
| 2.57E-04 | 1.85E-04 | 1.34E-04 | 9.63E-05 | 6.95E-05 | 5.01E-05 | 3.61E-05 | 2.60E-05 | 1.88E-05 | 1.35E-05 |
| 7.46E+00 | 5.60E+00 | 4.19E+00 | 3.14E+00 | 2.36E+00 | 1.76E+00 | 1.32E+00 | 9.90E-01 | 7.43E-01 | 5.57E-01 |
| 4.55E-01 | 3.41E-01 | 2.56E-01 | 1.91E-01 | 1.43E-01 | 1.07E-01 | 8.03E-02 | 6.01E-02 | 4.50E-02 | 3.38E-02 |
| 4.51E-11 | 3.38E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.87E+03 | 2.17E+03 | 1.63E+03 | 1.23E+03 | 9.27E+02 | 6.92E+02 | 5.18E+02 | 3.88E+02 | 2.90E+02 | 2.16E+02 |
| 7.56E+03 | 5.46E+03 | 3.94E+03 | 2.84E+03 | 2.06E+03 | 1.49E+03 | 1.07E+03 | 7.75E+02 | 5.60E+02 | 4.04E+02 |
| 1.17E+04 | 8.46E+03 | 6.11E+03 | 4.42E+03 | 3.19E+03 | 2.30E+03 | 1.67E+03 | 1.21E+03 | 8.69E+02 | 6.27E+02 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3:05     | 3:20     | 3:35     | 3:50     | 4:05     | 4:20     | 4:35     | 4:50     | 5:05     | 5:20     |
| 8.22E-02 | 5.94E-02 | 4.29E-02 | 3.10E-02 | 2.24E-02 | 1.62E-02 | 1.17E-02 | 8.44E-03 | 6.10E-03 | 4.41E-03 |
| 9.36E+01 | 6.77E+01 | 4.89E+01 | 3.53E+01 | 2.55E+01 | 1.84E+01 | 1.33E+01 | 9.63E+00 | 6.92E+00 | 5.00E+00 |
| 1.48E+02 | 1.07E+02 | 7.71E+01 | 5.57E+01 | 4.02E+01 | 2.91E+01 | 2.10E+01 | 1.51E+01 | 1.10E+01 | 7.91E+00 |
| 8.81E+02 | 6.36E+02 | 4.60E+02 | 3.32E+02 | 2.39E+02 | 1.73E+02 | 1.25E+02 | 9.00E+01 | 6.53E+01 | 4.72E+01 |
| 2.30E+01 | 1.66E+01 | 1.20E+01 | 8.66E+00 | 6.26E+00 | 4.52E+00 | 3.27E+00 | 2.36E+00 | 1.70E+00 | 1.23E+00 |
| 1.26E+04 | 9.09E+03 | 6.56E+03 | 4.73E+03 | 3.42E+03 | 2.48E+03 | 1.78E+03 | 1.29E+03 | 9.36E+02 | 6.73E+02 |
| 1.23E+01 | 8.91E+00 | 6.44E+00 | 4.64E+00 | 3.36E+00 | 2.42E+00 | 1.75E+00 | 1.26E+00 | 9.09E-01 | 6.58E-01 |
| 9.54E+03 | 6.88E+03 | 4.97E+03 | 3.59E+03 | 2.59E+03 | 1.87E+03 | 1.35E+03 | 9.81E+02 | 7.06E+02 | 5.10E+02 |
| 5.76E+00 | 4.16E+00 | 3.01E+00 | 2.17E+00 | 1.57E+00 | 1.13E+00 | 8.15E-01 | 5.88E-01 | 4.25E-01 | 3.06E-01 |
| 1.23E-05 | 8.76E-06 | 6.24E-06 | 4.45E-06 | 3.17E-06 | 2.26E-06 | 1.61E-06 | 1.15E-06 | 8.24E-07 | 5.90E-07 |
| 1.96E+02 | 1.47E+02 | 1.10E+02 | 8.26E+01 | 6.19E+01 | 4.64E+01 | 3.48E+01 | 2.61E+01 | 1.96E+01 | 1.47E+01 |
| 9.99E+00 | 7.49E+00 | 5.60E+00 | 4.18E+00 | 3.11E+00 | 2.32E+00 | 1.73E+00 | 1.28E+00 | 9.54E-01 | 7.06E-01 |
| 1.94E-09 | 1.40E-09 | 1.01E-09 | 7.28E-10 | 5.25E-10 | 3.78E-10 | 2.73E-10 | 1.96E-10 | 1.41E-10 | 1.02E-10 |
| 7.93E+02 | 5.72E+02 | 4.14E+02 | 2.99E+02 | 2.16E+02 | 1.56E+02 | 1.13E+02 | 8.14E+01 | 5.88E+01 | 4.25E+01 |
| 7.02E-01 | 5.07E-01 | 3.66E-01 | 2.65E-01 | 1.91E-01 | 1.38E-01 | 9.90E-02 | 7.18E-02 | 5.18E-02 | 3.74E-02 |
| 5.33E-10 | 3.83E-10 | 2.76E-10 | 1.99E-10 | 1.43E-10 | 1.04E-10 | 7.43E-11 | 5.35E-11 | 3.85E-11 | 2.77E-11 |
| 6.06E+00 | 4.37E+00 | 3.16E+00 | 2.29E+00 | 1.65E+00 | 1.19E+00 | 8.60E-01 | 6.22E-01 | 4.49E-01 | 3.24E-01 |
| 5.71E+00 | 4.12E+00 | 2.98E+00 | 2.15E+00 | 1.55E+00 | 1.12E+00 | 8.08E-01 | 5.84E-01 | 4.21E-01 | 3.04E-01 |
| 8.81E+02 | 6.36E+02 | 4.60E+02 | 3.32E+02 | 2.39E+02 | 1.73E+02 | 1.25E+02 | 9.00E+01 | 6.53E+01 | 4.72E+01 |
| 6.67E-02 | 4.82E-02 | 3.48E-02 | 2.51E-02 | 1.82E-02 | 1.31E-02 | 9.45E-03 | 6.85E-03 | 4.95E-03 | 3.57E-03 |
| 4.92E-03 | 3.56E-03 | 2.57E-03 | 1.85E-03 | 1.34E-03 | 9.72E-04 | 7.00E-04 | 5.06E-04 | 3.65E-04 | 2.64E-04 |
| 1.76E+02 | 1.27E+02 | 9.18E+01 | 6.62E+01 | 4.78E+01 | 3.46E+01 | 2.49E+01 | 1.80E+01 | 1.31E+01 | 9.36E+00 |
| 2.36E+00 | 1.70E+00 | 1.22E+00 | 8.87E-01 | 6.40E-01 | 4.63E-01 | 3.34E-01 | 2.41E-01 | 1.74E-01 | 1.26E-01 |
| 1.09E+02 | 7.88E+01 | 5.69E+01 | 4.10E+01 | 2.97E+01 | 2.14E+01 | 1.55E+01 | 1.12E+01 | 8.07E+00 | 5.83E+00 |
| 1.09E+02 | 7.89E+01 | 5.70E+01 | 4.11E+01 | 2.97E+01 | 2.15E+01 | 1.55E+01 | 1.12E+01 | 8.09E+00 | 5.84E+00 |
| 2.69E+02 | 1.94E+02 | 1.40E+02 | 1.02E+02 | 7.33E+01 | 5.29E+01 | 3.83E+01 | 2.76E+01 | 2.00E+01 | 1.44E+01 |
| 1.94E-05 | 1.40E-05 | 1.01E-05 | 7.28E-06 | 5.25E-06 | 3.79E-06 | 2.73E-06 | 1.97E-06 | 1.42E-06 | 1.03E-06 |
| 3.63E+03 | 2.62E+03 | 1.89E+03 | 1.37E+03 | 9.90E+02 | 7.13E+02 | 5.15E+02 | 3.72E+02 | 2.68E+02 | 1.94E+02 |
| 1.99E+03 | 1.43E+03 | 1.04E+03 | 7.49E+02 | 5.41E+02 | 3.91E+02 | 2.83E+02 | 2.04E+02 | 1.48E+02 | 1.06E+02 |
| 1.88E-09 | 1.35E-09 | 9.72E-10 | 7.02E-10 | 5.06E-10 | 3.65E-10 | 2.63E-10 | 1.89E-10 | 1.36E-10 | 9.81E-11 |
| 3.25E+02 | 2.35E+02 | 1.69E+02 | 1.22E+02 | 8.86E+01 | 6.40E+01 | 4.63E+01 | 3.34E+01 | 2.41E+01 | 1.75E+01 |
| 3.39E+02 | 2.45E+02 | 1.77E+02 | 1.28E+02 | 9.27E+01 | 6.67E+01 | 4.82E+01 | 3.48E+01 | 2.51E+01 | 1.82E+01 |
| 1.99E+02 | 1.44E+02 | 1.04E+02 | 7.50E+01 | 5.42E+01 | 3.91E+01 | 2.83E+01 | 2.04E+01 | 1.48E+01 | 1.06E+01 |
| 3.06E+02 | 2.21E+02 | 1.59E+02 | 1.15E+02 | 8.32E+01 | 6.00E+01 | 4.34E+01 | 3.13E+01 | 2.26E+01 | 1.64E+01 |
| 9.72E-06 | 7.03E-06 | 5.07E-06 | 3.65E-06 | 2.63E-06 | 1.90E-06 | 1.37E-06 | 9.90E-07 | 7.10E-07 | 5.12E-07 |
| 4.18E-01 | 3.13E-01 | 2.35E-01 | 1.76E-01 | 1.32E-01 | 9.90E-02 | 7.41E-02 | 5.55E-02 | 4.16E-02 | 3.12E-02 |
| 2.53E-02 | 1.89E-02 | 1.41E-02 | 1.06E-02 | 7.95E-03 | 5.96E-03 | 4.46E-03 | 3.34E-03 | 2.50E-03 | 1.87E-03 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.61E+02 | 1.20E+02 | 8.92E+01 | 6.62E+01 | 4.92E+01 | 3.65E+01 | 2.71E+01 | 2.01E+01 | 1.49E+01 | 1.10E+01 |
| 2.93E+02 | 2.11E+02 | 1.52E+02 | 1.10E+02 | 7.96E+01 | 5.74E+01 | 4.15E+01 | 3.00E+01 | 2.17E+01 | 1.57E+01 |
| 4.53E+02 | 3.28E+02 | 2.37E+02 | 1.71E+02 | 1.23E+02 | 8.91E+01 | 6.44E+01 | 4.64E+01 | 3.36E+01 | 2.42E+01 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 5:35     | 5:50     | 6:05     | 6:20     | 6:35     | 6:50     | 7:05     | 7:20     | 7:35     | 7:50     |
| 3.19E-03 | 2.30E-03 | 1.67E-03 | 1.20E-03 | 8.68E-04 | 6.26E-04 | 4.53E-04 | 3.27E-04 | 2.37E-04 | 1.71E-04 |
| 3.61E+00 | 2.61E+00 | 1.88E+00 | 1.36E+00 | 9.81E-01 | 7.08E-01 | 5.11E-01 | 3.69E-01 | 2.66E-01 | 1.93E-01 |
| 5.72E+00 | 4.12E+00 | 2.98E+00 | 2.15E+00 | 1.56E+00 | 1.13E+00 | 8.11E-01 | 5.85E-01 | 4.23E-01 | 3.05E-01 |
| 3.41E+01 | 2.47E+01 | 1.78E+01 | 1.29E+01 | 9.27E+00 | 6.71E+00 | 4.84E+00 | 3.50E+00 | 2.53E+00 | 1.83E+00 |
| 8.88E-01 | 6.42E-01 | 4.64E-01 | 3.35E-01 | 2.42E-01 | 1.75E-01 | 1.26E-01 | 9.09E-02 | 6.59E-02 | 4.76E-02 |
| 4.86E+02 | 3.51E+02 | 2.54E+02 | 1.84E+02 | 1.32E+02 | 9.54E+01 | 6.91E+01 | 5.00E+01 | 3.61E+01 | 2.60E+01 |
| 4.75E-01 | 3.43E-01 | 2.48E-01 | 1.79E-01 | 1.29E-01 | 9.36E-02 | 6.73E-02 | 4.86E-02 | 3.51E-02 | 2.53E-02 |
| 3.68E+02 | 2.66E+02 | 1.93E+02 | 1.39E+02 | 9.99E+01 | 7.25E+01 | 5.24E+01 | 3.78E+01 | 2.74E+01 | 1.97E+01 |
| 2.21E-01 | 1.59E-01 | 1.15E-01 | 8.32E-02 | 6.00E-02 | 4.33E-02 | 3.12E-02 | 2.26E-02 | 1.63E-02 | 1.18E-02 |
| 4.21E-07 | 3.02E-07 | 2.16E-07 | 1.55E-07 | 1.11E-07 | 7.96E-08 | 5.71E-08 | 4.10E-08 | 2.93E-08 | 2.11E-08 |
| 1.10E+01 | 8.27E+00 | 6.20E+00 | 4.65E+00 | 3.49E+00 | 2.62E+00 | 1.96E+00 | 1.48E+00 | 1.11E+00 | 8.28E-01 |
| 5.23E-01 | 3.88E-01 | 2.87E-01 | 2.12E-01 | 1.57E-01 | 1.16E-01 | 8.55E-02 | 6.31E-02 | 4.65E-02 | 3.43E-02 |
| 7.34E-11 | 5.29E-11 | 3.81E-11 | 2.75E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.07E+01 | 2.21E+01 | 1.60E+01 | 1.15E+01 | 8.34E+00 | 6.03E+00 | 4.36E+00 | 3.15E+00 | 2.27E+00 | 1.64E+00 |
| 2.70E-02 | 1.95E-02 | 1.40E-02 | 1.02E-02 | 7.34E-03 | 5.29E-03 | 3.83E-03 | 2.76E-03 | 1.99E-03 | 1.44E-03 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.34E-01 | 1.69E-01 | 1.22E-01 | 8.83E-02 | 6.38E-02 | 4.61E-02 | 3.33E-02 | 2.40E-02 | 1.74E-02 | 1.25E-02 |
| 2.20E-01 | 1.58E-01 | 1.14E-01 | 8.27E-02 | 5.98E-02 | 4.31E-02 | 3.11E-02 | 2.25E-02 | 1.62E-02 | 1.17E-02 |
| 3.41E+01 | 2.47E+01 | 1.78E+01 | 1.29E+01 | 9.27E+00 | 6.71E+00 | 4.84E+00 | 3.50E+00 | 2.53E+00 | 1.83E+00 |
| 2.58E-03 | 1.86E-03 | 1.35E-03 | 9.72E-04 | 7.04E-04 | 5.09E-04 | 3.67E-04 | 2.66E-04 | 1.92E-04 | 1.39E-04 |
| 1.91E-04 | 1.38E-04 | 9.99E-05 | 7.18E-05 | 5.19E-05 | 3.75E-05 | 2.71E-05 | 1.95E-05 | 1.41E-05 | 1.02E-05 |
| 6.80E+00 | 4.91E+00 | 3.55E+00 | 2.56E+00 | 1.85E+00 | 1.33E+00 | 9.63E-01 | 6.98E-01 | 5.04E-01 | 3.64E-01 |
| 9.09E-02 | 6.55E-02 | 4.73E-02 | 3.42E-02 | 2.47E-02 | 1.78E-02 | 1.29E-02 | 9.27E-03 | 6.71E-03 | 4.85E-03 |
| 4.21E+00 | 3.04E+00 | 2.20E+00 | 1.58E+00 | 1.14E+00 | 8.28E-01 | 5.98E-01 | 4.32E-01 | 3.12E-01 | 2.25E-01 |
| 4.22E+00 | 3.05E+00 | 2.21E+00 | 1.59E+00 | 1.15E+00 | 8.30E-01 | 5.99E-01 | 4.33E-01 | 3.12E-01 | 2.26E-01 |
| 1.04E+01 | 7.52E+00 | 5.44E+00 | 3.92E+00 | 2.84E+00 | 2.05E+00 | 1.48E+00 | 1.07E+00 | 7.72E-01 | 5.58E-01 |
| 7.38E-07 | 5.32E-07 | 3.83E-07 | 2.76E-07 | 2.00E-07 | 1.44E-07 | 1.04E-07 | 7.48E-08 | 5.39E-08 | 3.89E-08 |
| 1.40E+02 | 1.01E+02 | 7.31E+01 | 5.28E+01 | 3.82E+01 | 2.75E+01 | 1.99E+01 | 1.44E+01 | 1.04E+01 | 7.50E+00 |
| 7.69E+01 | 5.55E+01 | 4.01E+01 | 2.90E+01 | 2.10E+01 | 1.51E+01 | 1.09E+01 | 7.89E+00 | 5.70E+00 | 4.12E+00 |
| 7.07E-11 | 5.09E-11 | 3.67E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.26E+01 | 9.09E+00 | 6.59E+00 | 4.76E+00 | 3.44E+00 | 2.48E+00 | 1.79E+00 | 1.30E+00 | 9.36E-01 | 6.77E-01 |
| 1.31E+01 | 9.45E+00 | 6.84E+00 | 4.94E+00 | 3.57E+00 | 2.58E+00 | 1.86E+00 | 1.35E+00 | 9.72E-01 | 7.02E-01 |
| 7.69E+00 | 5.55E+00 | 4.01E+00 | 2.90E+00 | 2.09E+00 | 1.51E+00 | 1.09E+00 | 7.88E-01 | 5.69E-01 | 4.11E-01 |
| 1.18E+01 | 8.52E+00 | 6.16E+00 | 4.45E+00 | 3.21E+00 | 2.32E+00 | 1.67E+00 | 1.21E+00 | 8.74E-01 | 6.31E-01 |
| 3.69E-07 | 2.66E-07 | 1.92E-07 | 1.39E-07 | 9.99E-08 | 7.18E-08 | 5.18E-08 | 3.74E-08 | 2.69E-08 | 1.94E-08 |
| 2.34E-02 | 1.76E-02 | 1.31E-02 | 9.81E-03 | 7.38E-03 | 5.54E-03 | 4.15E-03 | 3.11E-03 | 2.33E-03 | 1.75E-03 |
| 1.40E-03 | 1.05E-03 | 7.88E-04 | 5.90E-04 | 4.42E-04 | 3.31E-04 | 2.48E-04 | 1.85E-04 | 1.39E-04 | 1.04E-04 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 8.12E+00 | 5.99E+00 | 4.43E+00 | 3.27E+00 | 2.41E+00 | 1.78E+00 | 1.31E+00 | 9.63E-01 | 7.11E-01 | 5.24E-01 |
| 1.13E+01 | 8.15E+00 | 5.90E+00 | 4.26E+00 | 3.08E+00 | 2.22E+00 | 1.60E+00 | 1.16E+00 | 8.37E-01 | 6.05E-01 |
| 1.76E+01 | 1.27E+01 | 9.18E+00 | 6.60E+00 | 4.77E+00 | 3.45E+00 | 2.48E+00 | 1.80E+00 | 1.30E+00 | 9.36E-01 |



| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 8:05     | 8:20     | 8:35     | 8:50     | 9:05     | 9:20     | 9:35     | 9:50     | 10:05    | 10:20    |
| 1.23E-04 | 8.91E-05 | 6.44E-05 | 4.65E-05 | 3.36E-05 | 2.43E-05 | 1.76E-05 | 1.27E-05 | 9.18E-06 | 6.62E-06 |
| 1.39E-01 | 9.99E-02 | 7.24E-02 | 5.23E-02 | 3.77E-02 | 2.73E-02 | 1.97E-02 | 1.42E-02 | 1.03E-02 | 7.41E-03 |
| 2.21E-01 | 1.59E-01 | 1.15E-01 | 8.31E-02 | 6.00E-02 | 4.34E-02 | 3.13E-02 | 2.26E-02 | 1.63E-02 | 1.18E-02 |
| 1.32E+00 | 9.54E-01 | 6.89E-01 | 4.97E-01 | 3.59E-01 | 2.59E-01 | 1.87E-01 | 1.35E-01 | 9.81E-02 | 7.07E-02 |
| 3.44E-02 | 2.48E-02 | 1.79E-02 | 1.30E-02 | 9.36E-03 | 6.76E-03 | 4.89E-03 | 3.53E-03 | 2.55E-03 | 1.85E-03 |
| 1.88E+01 | 1.36E+01 | 9.81E+00 | 7.09E+00 | 5.12E+00 | 3.70E+00 | 2.67E+00 | 1.94E+00 | 1.40E+00 | 1.01E+00 |
| 1.83E-02 | 1.32E-02 | 9.54E-03 | 6.89E-03 | 4.97E-03 | 3.59E-03 | 2.59E-03 | 1.87E-03 | 1.35E-03 | 9.72E-04 |
| 1.42E+01 | 1.03E+01 | 7.44E+00 | 5.37E+00 | 3.88E+00 | 2.81E+00 | 2.03E+00 | 1.47E+00 | 1.05E+00 | 7.64E-01 |
| 8.48E-03 | 6.12E-03 | 4.42E-03 | 3.19E-03 | 2.30E-03 | 1.67E-03 | 1.20E-03 | 8.65E-04 | 6.25E-04 | 4.51E-04 |
| 1.51E-08 | 1.09E-08 | 7.81E-09 | 5.62E-09 | 4.04E-09 | 2.90E-09 | 2.09E-09 | 1.50E-09 | 1.08E-09 | 7.77E-10 |
| 6.21E-01 | 4.65E-01 | 3.49E-01 | 2.62E-01 | 1.96E-01 | 1.48E-01 | 1.11E-01 | 8.29E-02 | 6.22E-02 | 4.66E-02 |
| 2.53E-02 | 1.86E-02 | 1.37E-02 | 1.01E-02 | 7.41E-03 | 5.45E-03 | 4.00E-03 | 2.93E-03 | 2.16E-03 | 1.58E-03 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.19E+00 | 8.57E-01 | 6.18E-01 | 4.46E-01 | 3.23E-01 | 2.33E-01 | 1.68E-01 | 1.22E-01 | 8.78E-02 | 6.35E-02 |
| 1.04E-03 | 7.50E-04 | 5.41E-04 | 3.91E-04 | 2.82E-04 | 2.03E-04 | 1.47E-04 | 1.06E-04 | 7.66E-05 | 5.54E-05 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 9.09E-03 | 6.55E-03 | 4.73E-03 | 3.42E-03 | 2.47E-03 | 1.78E-03 | 1.29E-03 | 9.27E-04 | 6.72E-04 | 4.86E-04 |
| 8.46E-03 | 6.11E-03 | 4.41E-03 | 3.19E-03 | 2.30E-03 | 1.66E-03 | 1.20E-03 | 8.65E-04 | 6.25E-04 | 4.51E-04 |
| 1.32E+00 | 9.54E-01 | 6.89E-01 | 4.97E-01 | 3.59E-01 | 2.59E-01 | 1.87E-01 | 1.35E-01 | 9.81E-02 | 7.07E-02 |
| 9.99E-05 | 7.23E-05 | 5.22E-05 | 3.77E-05 | 2.73E-05 | 1.97E-05 | 1.42E-05 | 1.03E-05 | 7.43E-06 | 5.36E-06 |
| 7.38E-06 | 5.33E-06 | 3.85E-06 | 2.78E-06 | 2.01E-06 | 1.45E-06 | 1.04E-06 | 7.57E-07 | 5.47E-07 | 3.95E-07 |
| 2.63E-01 | 1.90E-01 | 1.37E-01 | 9.90E-02 | 7.16E-02 | 5.18E-02 | 3.74E-02 | 2.70E-02 | 1.95E-02 | 1.40E-02 |
| 3.50E-03 | 2.53E-03 | 1.83E-03 | 1.31E-03 | 9.54E-04 | 6.88E-04 | 4.96E-04 | 3.58E-04 | 2.59E-04 | 1.87E-04 |
| 1.63E-01 | 1.18E-01 | 8.49E-02 | 6.13E-02 | 4.43E-02 | 3.20E-02 | 2.31E-02 | 1.67E-02 | 1.21E-02 | 8.70E-03 |
| 1.63E-01 | 1.18E-01 | 8.51E-02 | 6.15E-02 | 4.44E-02 | 3.20E-02 | 2.31E-02 | 1.67E-02 | 1.21E-02 | 8.72E-03 |
| 4.03E-01 | 2.91E-01 | 2.11E-01 | 1.52E-01 | 1.10E-01 | 7.93E-02 | 5.72E-02 | 4.14E-02 | 2.99E-02 | 2.16E-02 |
| 2.80E-08 | 2.02E-08 | 1.46E-08 | 1.05E-08 | 7.58E-09 | 5.46E-09 | 3.94E-09 | 2.84E-09 | 2.04E-09 | 1.48E-09 |
| 5.42E+00 | 3.92E+00 | 2.83E+00 | 2.04E+00 | 1.48E+00 | 1.06E+00 | 7.70E-01 | 5.55E-01 | 4.01E-01 | 2.90E-01 |
| 2.98E+00 | 2.15E+00 | 1.56E+00 | 1.13E+00 | 8.10E-01 | 5.85E-01 | 4.23E-01 | 3.05E-01 | 2.21E-01 | 1.59E-01 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.90E-01 | 3.54E-01 | 2.56E-01 | 1.85E-01 | 1.33E-01 | 9.63E-02 | 6.97E-02 | 5.03E-02 | 3.64E-02 | 2.63E-02 |
| 5.08E-01 | 3.66E-01 | 2.65E-01 | 1.91E-01 | 1.38E-01 | 9.99E-02 | 7.21E-02 | 5.20E-02 | 3.76E-02 | 2.72E-02 |
| 2.97E-01 | 2.14E-01 | 1.55E-01 | 1.12E-01 | 8.07E-02 | 5.83E-02 | 4.21E-02 | 3.04E-02 | 2.20E-02 | 1.58E-02 |
| 4.56E-01 | 3.29E-01 | 2.38E-01 | 1.72E-01 | 1.24E-01 | 8.96E-02 | 6.47E-02 | 4.67E-02 | 3.38E-02 | 2.44E-02 |
| 1.40E-08 | 1.01E-08 | 7.26E-09 | 5.23E-09 | 3.77E-09 | 2.72E-09 | 1.96E-09 | 1.41E-09 | 1.02E-09 | 7.34E-10 |
| 1.31E-03 | 9.81E-04 | 7.35E-04 | 5.51E-04 | 4.13E-04 | 3.10E-04 | 2.32E-04 | 1.74E-04 | 1.31E-04 | 9.81E-05 |
| 7.79E-05 | 5.84E-05 | 4.37E-05 | 3.28E-05 | 2.46E-05 | 1.84E-05 | 1.38E-05 | 1.04E-05 | 7.72E-06 | 5.78E-06 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.85E-01 | 2.84E-01 | 2.08E-01 | 1.53E-01 | 1.13E-01 | 8.26E-02 | 6.07E-02 | 4.46E-02 | 3.27E-02 | 2.39E-02 |
| 4.37E-01 | 3.15E-01 | 2.28E-01 | 1.65E-01 | 1.19E-01 | 8.59E-02 | 6.20E-02 | 4.48E-02 | 3.23E-02 | 2.34E-02 |
| 6.77E-01 | 4.89E-01 | 3.53E-01 | 2.55E-01 | 1.85E-01 | 1.33E-01 | 9.63E-02 | 6.95E-02 | 5.01E-02 | 3.63E-02 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 10:35    | 10:50    | 11:05    | 11:20    | 11:35    | 11:50    | 12:05    | 12:20    | 12:35    | 12:50    |
| 4.78E-06 | 3.46E-06 | 2.49E-06 | 1.80E-06 | 1.31E-06 | 9.36E-07 | 6.80E-07 | 4.91E-07 | 3.55E-07 | 2.57E-07 |
| 5.35E-03 | 3.86E-03 | 2.79E-03 | 2.02E-03 | 1.45E-03 | 1.05E-03 | 7.57E-04 | 5.46E-04 | 3.94E-04 | 2.85E-04 |
| 8.51E-03 | 6.15E-03 | 4.45E-03 | 3.21E-03 | 2.31E-03 | 1.67E-03 | 1.21E-03 | 8.73E-04 | 6.31E-04 | 4.55E-04 |
| 5.10E-02 | 3.69E-02 | 2.66E-02 | 1.93E-02 | 1.39E-02 | 1.01E-02 | 7.25E-03 | 5.24E-03 | 3.78E-03 | 2.74E-03 |
| 1.33E-03 | 9.63E-04 | 6.94E-04 | 5.01E-04 | 3.62E-04 | 2.62E-04 | 1.89E-04 | 1.37E-04 | 9.90E-05 | 7.12E-05 |
| 7.28E-01 | 5.27E-01 | 3.80E-01 | 2.75E-01 | 1.98E-01 | 1.43E-01 | 1.04E-01 | 7.48E-02 | 5.40E-02 | 3.91E-02 |
| 7.04E-04 | 5.09E-04 | 3.67E-04 | 2.65E-04 | 1.91E-04 | 1.38E-04 | 9.99E-05 | 7.20E-05 | 5.19E-05 | 3.75E-05 |
| 5.52E-01 | 3.99E-01 | 2.88E-01 | 2.08E-01 | 1.50E-01 | 1.09E-01 | 7.84E-02 | 5.66E-02 | 4.10E-02 | 2.95E-02 |
| 3.25E-04 | 2.35E-04 | 1.69E-04 | 1.22E-04 | 8.83E-05 | 6.37E-05 | 4.60E-05 | 3.32E-05 | 2.39E-05 | 1.73E-05 |
| 5.59E-10 | 4.02E-10 | 2.89E-10 | 2.08E-10 | 1.50E-10 | 1.08E-10 | 7.77E-11 | 5.59E-11 | 4.02E-11 | 2.90E-11 |
| 3.49E-02 | 2.62E-02 | 1.97E-02 | 1.48E-02 | 1.11E-02 | 8.30E-03 | 6.22E-03 | 4.67E-03 | 3.50E-03 | 2.63E-03 |
| 1.16E-03 | 8.52E-04 | 6.26E-04 | 4.58E-04 | 3.36E-04 | 2.46E-04 | 1.80E-04 | 1.32E-04 | 9.63E-05 | 7.07E-05 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.58E-02 | 3.31E-02 | 2.39E-02 | 1.73E-02 | 1.25E-02 | 9.00E-03 | 6.52E-03 | 4.71E-03 | 3.40E-03 | 2.46E-03 |
| 4.00E-05 | 2.88E-05 | 2.08E-05 | 1.50E-05 | 1.08E-05 | 7.83E-06 | 5.65E-06 | 4.08E-06 | 2.94E-06 | 2.12E-06 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.51E-04 | 2.54E-04 | 1.83E-04 | 1.32E-04 | 9.54E-05 | 6.90E-05 | 4.99E-05 | 3.60E-05 | 2.60E-05 | 1.88E-05 |
| 3.26E-04 | 2.35E-04 | 1.70E-04 | 1.22E-04 | 8.85E-05 | 6.39E-05 | 4.62E-05 | 3.33E-05 | 2.40E-05 | 1.74E-05 |
| 5.10E-02 | 3.69E-02 | 2.66E-02 | 1.93E-02 | 1.39E-02 | 1.01E-02 | 7.25E-03 | 5.24E-03 | 3.78E-03 | 2.74E-03 |
| 3.88E-06 | 2.80E-06 | 2.03E-06 | 1.46E-06 | 1.05E-06 | 7.63E-07 | 5.51E-07 | 3.98E-07 | 2.88E-07 | 2.08E-07 |
| 2.85E-07 | 2.06E-07 | 1.49E-07 | 1.08E-07 | 7.78E-08 | 5.62E-08 | 4.06E-08 | 2.93E-08 | 2.12E-08 | 1.53E-08 |
| 1.02E-02 | 7.35E-03 | 5.31E-03 | 3.83E-03 | 2.77E-03 | 2.00E-03 | 1.45E-03 | 1.04E-03 | 7.54E-04 | 5.45E-04 |
| 1.35E-04 | 9.72E-05 | 7.04E-05 | 5.09E-05 | 3.67E-05 | 2.65E-05 | 1.92E-05 | 1.39E-05 | 9.99E-06 | 7.21E-06 |
| 6.29E-03 | 4.55E-03 | 3.28E-03 | 2.37E-03 | 1.71E-03 | 1.23E-03 | 8.93E-04 | 6.44E-04 | 4.65E-04 | 3.37E-04 |
| 6.30E-03 | 4.55E-03 | 3.29E-03 | 2.38E-03 | 1.71E-03 | 1.24E-03 | 8.95E-04 | 6.46E-04 | 4.66E-04 | 3.37E-04 |
| 1.56E-02 | 1.13E-02 | 8.14E-03 | 5.88E-03 | 4.25E-03 | 3.07E-03 | 2.21E-03 | 1.60E-03 | 1.15E-03 | 8.35E-04 |
| 1.06E-09 | 7.68E-10 | 5.54E-10 | 3.99E-10 | 2.88E-10 | 2.07E-10 | 1.49E-10 | 1.08E-10 | 7.78E-11 | 5.61E-11 |
| 2.10E-01 | 1.51E-01 | 1.09E-01 | 7.89E-02 | 5.70E-02 | 4.11E-02 | 2.97E-02 | 2.15E-02 | 1.55E-02 | 1.12E-02 |
| 1.15E-01 | 8.32E-02 | 6.01E-02 | 4.34E-02 | 3.13E-02 | 2.27E-02 | 1.64E-02 | 1.18E-02 | 8.54E-03 | 6.17E-03 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.90E-02 | 1.37E-02 | 9.90E-03 | 7.16E-03 | 5.17E-03 | 3.74E-03 | 2.70E-03 | 1.95E-03 | 1.41E-03 | 1.02E-03 |
| 1.96E-02 | 1.41E-02 | 1.03E-02 | 7.40E-03 | 5.34E-03 | 3.86E-03 | 2.79E-03 | 2.02E-03 | 1.46E-03 | 1.05E-03 |
| 1.14E-02 | 8.28E-03 | 5.98E-03 | 4.32E-03 | 3.11E-03 | 2.25E-03 | 1.63E-03 | 1.18E-03 | 8.49E-04 | 6.13E-04 |
| 1.76E-02 | 1.27E-02 | 9.18E-03 | 6.63E-03 | 4.79E-03 | 3.46E-03 | 2.50E-03 | 1.81E-03 | 1.31E-03 | 9.45E-04 |
| 5.29E-10 | 3.82E-10 | 2.75E-10 | 1.98E-10 | 1.43E-10 | 1.03E-10 | 7.42E-11 | 5.35E-11 | 3.85E-11 | 2.78E-11 |
| 7.33E-05 | 5.49E-05 | 4.11E-05 | 3.09E-05 | 2.31E-05 | 1.74E-05 | 1.30E-05 | 9.72E-06 | 7.30E-06 | 5.47E-06 |
| 4.33E-06 | 3.24E-06 | 2.43E-06 | 1.82E-06 | 1.36E-06 | 1.02E-06 | 7.64E-07 | 5.72E-07 | 4.28E-07 | 3.21E-07 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.76E-02 | 1.29E-02 | 9.45E-03 | 6.92E-03 | 5.08E-03 | 3.72E-03 | 2.72E-03 | 1.99E-03 | 1.46E-03 | 1.07E-03 |
| 1.69E-02 | 1.22E-02 | 8.80E-03 | 6.36E-03 | 4.59E-03 | 3.32E-03 | 2.39E-03 | 1.73E-03 | 1.25E-03 | 9.00E-04 |
| 2.62E-02 | 1.89E-02 | 1.37E-02 | 9.90E-03 | 7.13E-03 | 5.15E-03 | 3.72E-03 | 2.68E-03 | 1.94E-03 | 1.40E-03 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 13:05    | 13:20    | 13:35    | 13:50    | 14:05    | 14:20    | 14:35    | 14:50    | 15:05    | 15:20    |
| 1.85E-07 | 1.34E-07 | 9.63E-08 | 6.98E-08 | 5.04E-08 | 3.65E-08 | 2.63E-08 | 1.90E-08 | 1.38E-08 | 9.90E-09 |
| 2.06E-04 | 1.49E-04 | 1.07E-04 | 7.74E-05 | 5.59E-05 | 4.03E-05 | 2.92E-05 | 2.11E-05 | 1.52E-05 | 1.10E-05 |
| 3.29E-04 | 2.38E-04 | 1.72E-04 | 1.24E-04 | 8.95E-05 | 6.46E-05 | 4.67E-05 | 3.38E-05 | 2.44E-05 | 1.76E-05 |
| 1.97E-03 | 1.42E-03 | 1.03E-03 | 7.44E-04 | 5.37E-04 | 3.88E-04 | 2.81E-04 | 2.03E-04 | 1.47E-04 | 1.05E-04 |
| 5.15E-05 | 3.72E-05 | 2.68E-05 | 1.94E-05 | 1.40E-05 | 1.01E-05 | 7.31E-06 | 5.28E-06 | 3.82E-06 | 2.75E-06 |
| 2.82E-02 | 2.03E-02 | 1.47E-02 | 1.06E-02 | 7.68E-03 | 5.54E-03 | 4.01E-03 | 2.89E-03 | 2.09E-03 | 1.51E-03 |
| 2.71E-05 | 1.95E-05 | 1.41E-05 | 1.02E-05 | 7.36E-06 | 5.32E-06 | 3.83E-06 | 2.77E-06 | 2.00E-06 | 1.44E-06 |
| 2.13E-02 | 1.54E-02 | 1.12E-02 | 8.05E-03 | 5.81E-03 | 4.20E-03 | 3.03E-03 | 2.20E-03 | 1.58E-03 | 1.14E-03 |
| 1.25E-05 | 9.00E-06 | 6.50E-06 | 4.69E-06 | 3.38E-06 | 2.45E-06 | 1.76E-06 | 1.27E-06 | 9.18E-07 | 6.63E-07 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.97E-03 | 1.48E-03 | 1.11E-03 | 8.31E-04 | 6.23E-04 | 4.67E-04 | 3.50E-04 | 2.63E-04 | 1.97E-04 | 1.48E-04 |
| 5.18E-05 | 3.79E-05 | 2.77E-05 | 2.03E-05 | 1.49E-05 | 1.08E-05 | 7.91E-06 | 5.78E-06 | 4.22E-06 | 3.09E-06 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.77E-03 | 1.28E-03 | 9.27E-04 | 6.68E-04 | 4.82E-04 | 3.48E-04 | 2.52E-04 | 1.82E-04 | 1.31E-04 | 9.45E-05 |
| 1.54E-06 | 1.11E-06 | 8.00E-07 | 5.78E-07 | 4.17E-07 | 3.01E-07 | 2.17E-07 | 1.57E-07 | 1.13E-07 | 8.18E-08 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.36E-05 | 9.81E-06 | 7.08E-06 | 5.12E-06 | 3.70E-06 | 2.67E-06 | 1.93E-06 | 1.40E-06 | 1.01E-06 | 7.27E-07 |
| 1.25E-05 | 9.09E-06 | 6.53E-06 | 4.72E-06 | 3.41E-06 | 2.46E-06 | 1.77E-06 | 1.29E-06 | 9.27E-07 | 6.69E-07 |
| 1.97E-03 | 1.42E-03 | 1.03E-03 | 7.44E-04 | 5.37E-04 | 3.89E-04 | 2.81E-04 | 2.03E-04 | 1.47E-04 | 1.06E-04 |
| 1.50E-07 | 1.09E-07 | 7.84E-08 | 5.66E-08 | 4.09E-08 | 2.95E-08 | 2.13E-08 | 1.54E-08 | 1.12E-08 | 8.05E-09 |
| 1.11E-08 | 7.98E-09 | 5.77E-09 | 4.17E-09 | 3.01E-09 | 2.18E-09 | 1.57E-09 | 1.13E-09 | 8.20E-10 | 5.92E-10 |
| 3.93E-04 | 2.84E-04 | 2.05E-04 | 1.49E-04 | 1.07E-04 | 7.75E-05 | 5.60E-05 | 4.04E-05 | 2.92E-05 | 2.11E-05 |
| 5.20E-06 | 3.75E-06 | 2.71E-06 | 1.96E-06 | 1.41E-06 | 1.03E-06 | 7.38E-07 | 5.33E-07 | 3.84E-07 | 2.78E-07 |
| 2.43E-04 | 1.76E-04 | 1.27E-04 | 9.18E-05 | 6.61E-05 | 4.77E-05 | 3.45E-05 | 2.49E-05 | 1.80E-05 | 1.30E-05 |
| 2.43E-04 | 1.76E-04 | 1.27E-04 | 9.18E-05 | 6.62E-05 | 4.78E-05 | 3.46E-05 | 2.49E-05 | 1.80E-05 | 1.31E-05 |
| 6.03E-04 | 4.36E-04 | 3.15E-04 | 2.28E-04 | 1.65E-04 | 1.19E-04 | 8.58E-05 | 6.19E-05 | 4.47E-05 | 3.23E-05 |
| 4.04E-11 | 2.92E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 8.09E-03 | 5.84E-03 | 4.22E-03 | 3.05E-03 | 2.21E-03 | 1.59E-03 | 1.15E-03 | 8.30E-04 | 5.99E-04 | 4.33E-04 |
| 4.46E-03 | 3.22E-03 | 2.32E-03 | 1.68E-03 | 1.22E-03 | 8.77E-04 | 6.34E-04 | 4.57E-04 | 3.30E-04 | 2.39E-04 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 7.35E-04 | 5.31E-04 | 3.84E-04 | 2.77E-04 | 2.01E-04 | 1.45E-04 | 1.04E-04 | 7.56E-05 | 5.46E-05 | 3.94E-05 |
| 7.59E-04 | 5.48E-04 | 3.96E-04 | 2.86E-04 | 2.07E-04 | 1.49E-04 | 1.08E-04 | 7.79E-05 | 5.63E-05 | 4.06E-05 |
| 4.43E-04 | 3.20E-04 | 2.31E-04 | 1.67E-04 | 1.21E-04 | 8.69E-05 | 6.28E-05 | 4.54E-05 | 3.28E-05 | 2.37E-05 |
| 6.80E-04 | 4.91E-04 | 3.55E-04 | 2.57E-04 | 1.85E-04 | 1.33E-04 | 9.63E-05 | 6.98E-05 | 5.03E-05 | 3.64E-05 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4.10E-06 | 3.07E-06 | 2.30E-06 | 1.73E-06 | 1.30E-06 | 9.72E-07 | 7.27E-07 | 5.45E-07 | 4.09E-07 | 3.06E-07 |
| 2.40E-07 | 1.80E-07 | 1.35E-07 | 1.01E-07 | 7.57E-08 | 5.67E-08 | 4.25E-08 | 3.18E-08 | 2.39E-08 | 1.78E-08 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 7.81E-04 | 5.72E-04 | 4.18E-04 | 3.06E-04 | 2.23E-04 | 1.64E-04 | 1.20E-04 | 8.73E-05 | 6.38E-05 | 4.66E-05 |
| 6.53E-04 | 4.72E-04 | 3.40E-04 | 2.46E-04 | 1.77E-04 | 1.29E-04 | 9.27E-05 | 6.70E-05 | 4.83E-05 | 3.49E-05 |
| 1.01E-03 | 7.31E-04 | 5.28E-04 | 3.82E-04 | 2.75E-04 | 1.99E-04 | 1.44E-04 | 1.04E-04 | 7.50E-05 | 5.42E-05 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 15:35    | 15:50    | 16:05    | 16:20    | 16:35    | 16:50    | 17:05    | 17:20    | 17:35    | 17:50    |
| 7.17E-09 | 5.18E-09 | 3.74E-09 | 2.70E-09 | 1.95E-09 | 1.41E-09 | 1.02E-09 | 7.37E-10 | 5.32E-10 | 3.84E-10 |
| 7.92E-06 | 5.72E-06 | 4.13E-06 | 2.98E-06 | 2.15E-06 | 1.56E-06 | 1.13E-06 | 8.09E-07 | 5.84E-07 | 4.22E-07 |
| 1.27E-05 | 9.18E-06 | 6.62E-06 | 4.79E-06 | 3.46E-06 | 2.49E-06 | 1.80E-06 | 1.31E-06 | 9.36E-07 | 6.80E-07 |
| 7.64E-05 | 5.52E-05 | 3.99E-05 | 2.88E-05 | 2.08E-05 | 1.50E-05 | 1.09E-05 | 7.84E-06 | 5.66E-06 | 4.10E-06 |
| 1.99E-06 | 1.44E-06 | 1.04E-06 | 7.51E-07 | 5.42E-07 | 3.92E-07 | 2.83E-07 | 2.04E-07 | 1.48E-07 | 1.06E-07 |
| 1.09E-03 | 7.88E-04 | 5.69E-04 | 4.11E-04 | 2.97E-04 | 2.14E-04 | 1.55E-04 | 1.12E-04 | 8.09E-05 | 5.84E-05 |
| 1.04E-06 | 7.52E-07 | 5.44E-07 | 3.92E-07 | 2.84E-07 | 2.04E-07 | 1.48E-07 | 1.06E-07 | 7.70E-08 | 5.56E-08 |
| 8.26E-04 | 5.97E-04 | 4.31E-04 | 3.11E-04 | 2.25E-04 | 1.63E-04 | 1.18E-04 | 8.49E-05 | 6.13E-05 | 4.43E-05 |
| 4.79E-07 | 3.46E-07 | 2.49E-07 | 1.80E-07 | 1.30E-07 | 9.36E-08 | 6.77E-08 | 4.89E-08 | 3.53E-08 | 2.55E-08 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.11E-04 | 8.32E-05 | 6.24E-05 | 4.68E-05 | 3.51E-05 | 2.63E-05 | 1.97E-05 | 1.48E-05 | 1.11E-05 | 8.33E-06 |
| 2.25E-06 | 1.65E-06 | 1.20E-06 | 8.77E-07 | 6.40E-07 | 4.67E-07 | 3.40E-07 | 2.48E-07 | 1.81E-07 | 1.32E-07 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 6.86E-05 | 4.95E-05 | 3.57E-05 | 2.58E-05 | 1.86E-05 | 1.35E-05 | 9.72E-06 | 7.04E-06 | 5.09E-06 | 3.67E-06 |
| 5.90E-08 | 4.26E-08 | 3.08E-08 | 2.22E-08 | 1.60E-08 | 1.16E-08 | 8.35E-09 | 6.03E-09 | 4.36E-09 | 3.14E-09 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 5.26E-07 | 3.80E-07 | 2.75E-07 | 1.98E-07 | 1.43E-07 | 1.04E-07 | 7.47E-08 | 5.40E-08 | 3.90E-08 | 2.82E-08 |
| 4.82E-07 | 3.48E-07 | 2.52E-07 | 1.82E-07 | 1.31E-07 | 9.45E-08 | 6.84E-08 | 4.94E-08 | 3.56E-08 | 2.57E-08 |
| 7.64E-05 | 5.52E-05 | 3.99E-05 | 2.88E-05 | 2.08E-05 | 1.50E-05 | 1.09E-05 | 7.84E-06 | 5.66E-06 | 4.10E-06 |
| 5.81E-09 | 4.20E-09 | 3.03E-09 | 2.20E-09 | 1.58E-09 | 1.14E-09 | 8.27E-10 | 5.98E-10 | 4.32E-10 | 3.11E-10 |
| 4.28E-10 | 3.09E-10 | 2.23E-10 | 1.61E-10 | 1.16E-10 | 8.42E-11 | 6.08E-11 | 4.39E-11 | 3.17E-11 | 0.00E+00 |
| 1.52E-05 | 1.10E-05 | 7.96E-06 | 5.74E-06 | 4.15E-06 | 3.00E-06 | 2.17E-06 | 1.57E-06 | 1.13E-06 | 8.16E-07 |
| 2.01E-07 | 1.45E-07 | 1.04E-07 | 7.55E-08 | 5.45E-08 | 3.94E-08 | 2.84E-08 | 2.05E-08 | 1.49E-08 | 1.07E-08 |
| 9.36E-06 | 6.78E-06 | 4.90E-06 | 3.54E-06 | 2.56E-06 | 1.85E-06 | 1.33E-06 | 9.63E-07 | 6.95E-07 | 5.02E-07 |
| 9.36E-06 | 6.80E-06 | 4.91E-06 | 3.55E-06 | 2.56E-06 | 1.85E-06 | 1.33E-06 | 9.63E-07 | 6.97E-07 | 5.03E-07 |
| 2.33E-05 | 1.68E-05 | 1.22E-05 | 8.80E-06 | 6.35E-06 | 4.59E-06 | 3.32E-06 | 2.39E-06 | 1.73E-06 | 1.25E-06 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.12E-04 | 2.26E-04 | 1.63E-04 | 1.18E-04 | 8.51E-05 | 6.15E-05 | 4.44E-05 | 3.20E-05 | 2.31E-05 | 1.67E-05 |
| 1.73E-04 | 1.24E-04 | 9.00E-05 | 6.51E-05 | 4.70E-05 | 3.39E-05 | 2.45E-05 | 1.77E-05 | 1.28E-05 | 9.27E-06 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.85E-05 | 2.06E-05 | 1.49E-05 | 1.07E-05 | 7.77E-06 | 5.61E-06 | 4.05E-06 | 2.93E-06 | 2.12E-06 | 1.53E-06 |
| 2.93E-05 | 2.12E-05 | 1.53E-05 | 1.11E-05 | 7.99E-06 | 5.77E-06 | 4.17E-06 | 3.02E-06 | 2.18E-06 | 1.58E-06 |
| 1.71E-05 | 1.23E-05 | 8.92E-06 | 6.44E-06 | 4.65E-06 | 3.36E-06 | 2.43E-06 | 1.76E-06 | 1.27E-06 | 9.18E-07 |
| 2.63E-05 | 1.90E-05 | 1.37E-05 | 9.90E-06 | 7.15E-06 | 5.16E-06 | 3.73E-06 | 2.69E-06 | 1.94E-06 | 1.40E-06 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.30E-07 | 1.72E-07 | 1.29E-07 | 9.63E-08 | 7.25E-08 | 5.43E-08 | 4.07E-08 | 3.05E-08 | 2.29E-08 | 1.71E-08 |
| 1.33E-08 | 9.99E-09 | 7.50E-09 | 5.62E-09 | 4.20E-09 | 3.15E-09 | 2.36E-09 | 1.76E-09 | 1.32E-09 | 9.90E-10 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3.40E-05 | 2.48E-05 | 1.82E-05 | 1.32E-05 | 9.63E-06 | 7.07E-06 | 5.16E-06 | 3.76E-06 | 2.75E-06 | 2.00E-06 |
| 2.52E-05 | 1.82E-05 | 1.31E-05 | 9.54E-06 | 6.87E-06 | 4.96E-06 | 3.58E-06 | 2.58E-06 | 1.87E-06 | 1.35E-06 |
| 3.92E-05 | 2.83E-05 | 2.04E-05 | 1.48E-05 | 1.06E-05 | 7.70E-06 | 5.55E-06 | 4.01E-06 | 2.90E-06 | 2.10E-06 |

| #####    | #####    | #####    | #####    | #####    | #####    | #####    |
|----------|----------|----------|----------|----------|----------|----------|
| 18:05    | 18:20    | 18:35    | 18:50    | 19:05    | 19:20    | 19:35    |
| 2.78E-10 | 2.01E-10 | 1.45E-10 | 1.04E-10 | 7.57E-11 | 5.47E-11 | 3.95E-11 |
| 3.05E-07 | 2.20E-07 | 1.58E-07 | 1.14E-07 | 8.28E-08 | 5.98E-08 | 4.31E-08 |
| 4.91E-07 | 3.55E-07 | 2.56E-07 | 1.85E-07 | 1.33E-07 | 9.63E-08 | 6.97E-08 |
| 2.95E-06 | 2.13E-06 | 1.54E-06 | 1.12E-06 | 8.05E-07 | 5.81E-07 | 4.20E-07 |
| 7.70E-08 | 5.56E-08 | 4.01E-08 | 2.90E-08 | 2.10E-08 | 1.51E-08 | 1.10E-08 |
| 4.22E-05 | 3.05E-05 | 2.21E-05 | 1.59E-05 | 1.15E-05 | 8.31E-06 | 6.00E-06 |
| 4.01E-08 | 2.90E-08 | 2.09E-08 | 1.51E-08 | 1.09E-08 | 7.88E-09 | 5.69E-09 |
| 3.20E-05 | 2.31E-05 | 1.67E-05 | 1.21E-05 | 8.71E-06 | 6.29E-06 | 4.55E-06 |
| 1.84E-08 | 1.32E-08 | 9.54E-09 | 6.90E-09 | 4.99E-09 | 3.60E-09 | 2.59E-09 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 6.25E-06 | 4.68E-06 | 3.51E-06 | 2.64E-06 | 1.97E-06 | 1.49E-06 | 1.11E-06 |
| 9.63E-08 | 7.03E-08 | 5.12E-08 | 3.74E-08 | 2.72E-08 | 1.98E-08 | 1.45E-08 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.66E-06 | 1.92E-06 | 1.39E-06 | 9.99E-07 | 7.22E-07 | 5.21E-07 | 3.76E-07 |
| 2.27E-09 | 1.64E-09 | 1.18E-09 | 8.54E-10 | 6.17E-10 | 4.46E-10 | 3.21E-10 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2.03E-08 | 1.47E-08 | 1.06E-08 | 7.67E-09 | 5.54E-09 | 4.01E-09 | 2.89E-09 |
| 1.85E-08 | 1.34E-08 | 9.72E-09 | 6.99E-09 | 5.05E-09 | 3.65E-09 | 2.64E-09 |
| 2.95E-06 | 2.13E-06 | 1.54E-06 | 1.12E-06 | 8.05E-07 | 5.81E-07 | 4.20E-07 |
| 2.25E-10 | 1.63E-10 | 1.18E-10 | 8.50E-11 | 6.14E-11 | 4.44E-11 | 3.20E-11 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 5.90E-07 | 4.26E-07 | 3.08E-07 | 2.22E-07 | 1.60E-07 | 1.16E-07 | 8.38E-08 |
| 7.73E-09 | 5.59E-09 | 4.03E-09 | 2.92E-09 | 2.11E-09 | 1.52E-09 | 1.10E-09 |
| 3.63E-07 | 2.62E-07 | 1.89E-07 | 1.37E-07 | 9.90E-08 | 7.13E-08 | 5.15E-08 |
| 3.64E-07 | 2.62E-07 | 1.90E-07 | 1.37E-07 | 9.90E-08 | 7.14E-08 | 5.16E-08 |
| 9.00E-07 | 6.53E-07 | 4.72E-07 | 3.40E-07 | 2.46E-07 | 1.77E-07 | 1.29E-07 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.21E-05 | 8.73E-06 | 6.31E-06 | 4.55E-06 | 3.29E-06 | 2.38E-06 | 1.72E-06 |
| 6.68E-06 | 4.82E-06 | 3.48E-06 | 2.52E-06 | 1.82E-06 | 1.31E-06 | 9.45E-07 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.11E-06 | 7.97E-07 | 5.76E-07 | 4.16E-07 | 3.01E-07 | 2.17E-07 | 1.57E-07 |
| 1.13E-06 | 8.20E-07 | 5.92E-07 | 4.28E-07 | 3.09E-07 | 2.23E-07 | 1.61E-07 |
| 6.61E-07 | 4.77E-07 | 3.45E-07 | 2.48E-07 | 1.80E-07 | 1.30E-07 | 9.36E-08 |
| 1.02E-06 | 7.33E-07 | 5.29E-07 | 3.83E-07 | 2.76E-07 | 1.99E-07 | 1.44E-07 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.29E-08 | 9.63E-09 | 7.22E-09 | 5.41E-09 | 4.06E-09 | 3.04E-09 | 2.28E-09 |
| 7.42E-10 | 5.55E-10 | 4.16E-10 | 3.11E-10 | 2.33E-10 | 1.75E-10 | 1.31E-10 |
| 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1.46E-06 | 1.06E-06 | 7.77E-07 | 5.66E-07 | 4.13E-07 | 3.01E-07 | 2.20E-07 |
| 9.72E-07 | 7.04E-07 | 5.09E-07 | 3.67E-07 | 2.66E-07 | 1.92E-07 | 1.39E-07 |
| 1.51E-06 | 1.09E-06 | 7.89E-07 | 5.70E-07 | 4.11E-07 | 2.97E-07 | 2.15E-07 |

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**From:** RMPACTSU\_ELNRC <RMPACTSU\_ELNRC@ofda.gov>  
**Sent:** Wednesday, March 16, 2011 11:16 AM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc; LIA08 Hoc  
**Subject:** FW: JAP EQ/TSU MITAM - March 16, 2011 (2300)  
**Attachments:** PacTSU MITAM - March 16 2011.xls

**Categories:** FOIA, Red Category

This is the priority and distribution system used for the Japanese response.

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**From:** Bock, Yoni  
**Sent:** Wednesday, March 16, 2011 11:11 AM

**To:** (b)(6)

**Cc:** (b)(6)

(b)(6)

**Subject:** JAP EQ/TSU MITAM - March 16, 2011 (2300)

CAT Chiefs - MITAM for action.

Everyone else - Info

This MITAM updates the one distributed at 1300 today. New missions include 4 additional requests to procure/source commodities and transport for JJF and one request to support the Australian USAR team.

Please provide updates on previously tasked missions and feedback on the new ones attached.

v/r  
Yoni

~~~~~  
Mr. Yonahton Bock
Military Liaison Officer / Civ-Mil Coordinator
Japan Earthquake/Tsunami DART
Email: ybock@usaid.gov
Blackberry: (b)(6)

DNS at USFJ: 225-4329, 3137, 2469

From US (or non DSN) (011 81) 425 522-511
From Japan (non DSN) 0425 522-511
after dial tone, ext 54329, 52469, 53137

Current Location: Yokota AB, Tokyo, Japan
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(b)(5)

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(b)(5)

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**From:** LIA07 Hoc  
**Sent:** Wednesday, March 16, 2011 10:58 AM  
**To:** OST04 Hoc  
**Subject:** FW: DOE Japan Earthquake SitRep 0600EDT March 16, 2011  
**Attachments:** Japan\_Earthquake\_Response\_03162011\_0600\_v1.ppt; WTW Update SITREP Report 031611 0600.docx

FYI

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**From:** RMTFACTSU\_ELNRC [mailto:RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Wednesday, March 16, 2011 10:49 AM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA08 Hoc; LIA02 Hoc; Harrington, Holly; McIntyre, David; Burnell, Scott; Marshall, Jane; Gott, William; Grant, Jeffery  
**Subject:** DOE Japan Earthquake SitRep 0600EDT March 16, 2011

**Subject:** FW: DOE Japan Earthquake SitRep 0600EDT March 16, 2011

**From:** Bill Froh [mailto:(b)(6)]  
**Sent:** Wednesday, March 16, 2011 9:45 AM  
**To:** RMTFACTSU\_DOE  
**Subject:** Fwd: DOE Japan Earthquake SitRep 0600EDT March 16, 2011

Chris,

FYI, here's the latest situation report (SITREP) from DOE

Bill

----- Forwarded message -----

**From:** NITOPS <NITOPS@nnsa.doe.gov>  
**Date:** Wed, Mar 16, 2011 at 6:42 AM  
**Subject:** DOE Japan Earthquake SitRep 0600EDT March 16, 2011

**To:** (b)(6)

(b)(6)



(b)(6)

Cc: "Mustin, Tracy" <[Tracy.Mustin@nnsa.doe.gov](mailto:Tracy.Mustin@nnsa.doe.gov)>, "Miller, Neile" <[Neile.Miller@nnsa.doe.gov](mailto:Neile.Miller@nnsa.doe.gov)>, "Johnson, Shane" <[SHANE.JOHNSON@nuclear.energy.gov](mailto:SHANE.JOHNSON@nuclear.energy.gov)>, "Connery, Joyce" <[Joyce.Connery@hq.doe.gov](mailto:Joyce.Connery@hq.doe.gov)>, "Kelly, John E (NE)" <[JohnE.Kelly@nuclear.energy.gov](mailto:JohnE.Kelly@nuclear.energy.gov)>, "Alldridge, David" <[David.Alldridge@nnsa.doe.gov](mailto:David.Alldridge@nnsa.doe.gov)>, "Niedzielski-Eichner, Phillip" <[Phillip.Niedzielski-Eichner@nnsa.doe.gov](mailto:Phillip.Niedzielski-Eichner@nnsa.doe.gov)>, "Huizenga, David" <[David.Huizenga@nnsa.doe.gov](mailto:David.Huizenga@nnsa.doe.gov)>, "Lyons, Peter" <[Peter.Lyons@nuclear.energy.gov](mailto:Peter.Lyons@nuclear.energy.gov)>, "White, William" <[William.White@nnsa.doe.gov](mailto:William.White@nnsa.doe.gov)>, "Thompson, Michael" <[Michael.Thompson@nnsa.doe.gov](mailto:Michael.Thompson@nnsa.doe.gov)>, "Fremont, Douglas" <[Douglas.Fremont@nnsa.doe.gov](mailto:Douglas.Fremont@nnsa.doe.gov)>, "Goodrum, Steve" <[Steve.Goodrum@nnsa.doe.gov](mailto:Steve.Goodrum@nnsa.doe.gov)>, "Calbos, Philip" <[Philip.Calbos@nnsa.doe.gov](mailto:Philip.Calbos@nnsa.doe.gov)>, "Whitney, Mark" <[Mark.Whitney@nnsa.doe.gov](mailto:Mark.Whitney@nnsa.doe.gov)>, "Owens, Missy" <[Missy.Owens@hq.doe.gov](mailto:Missy.Owens@hq.doe.gov)>, "Adams, Ian" <[Ian.Adams@hq.doe.gov](mailto:Ian.Adams@hq.doe.gov)>, "Sandalow, David" <[David.Sandalow@hq.doe.gov](mailto:David.Sandalow@hq.doe.gov)>, "Smith-Kevern, Rebecca" <[Rebecca.Smith-Kevern@nuclear.energy.gov](mailto:Rebecca.Smith-Kevern@nuclear.energy.gov)>, "Golub, Sal" <[sal.golub@nuclear.energy.gov](mailto:sal.golub@nuclear.energy.gov)>

Please find attached the latest DOE/NNSA SITREP regarding the ongoing earthquake and tsunami response in Japan.

Please note that this is the first distribution of this SITREP to a broader interagency audience. The modeling results included in the powerpoint file are sensitive as they are based on limited data from Japan and rely primarily on best judgment with conservatism, based on what we believe the current situation to be.

This information is provided for your internal use and should be shared only with those who have a need to know. Further distribution of this information outside of your agency should be pre-cleared with this office, which can be reach at [NITOPS@nnsa.doe.gov](mailto:NITOPS@nnsa.doe.gov) (202-586-8100)

With this report, we will go to a 12-hour delivery of the SITREP. Reports should be issues at 0600 and 1800 each day.

New information since the last report is highlighted in yellow.

Nuclear Incident Team (NIT)  
Office of Emergency Response (NA-42)  
National Nuclear Security Administration  
U.S. Department of Energy  
[nitops@nnsa.doe.gov](mailto:nitops@nnsa.doe.gov)  
[nit@doe.sgov.gov](mailto:nit@doe.sgov.gov)  
202-586-8100

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 10:32 AM  
**To:** RMTPACTSU\_ELNRC  
**Cc:** (b)(6) Kozal, Jason  
**Subject:** FW: NRC Contacts

FYI

---

**From:** HOO Hoc  
**Sent:** Wednesday, March 16, 2011 9:50 AM  
**To:** RST01 Hoc; PMT01 Hoc; ET07 Hoc; LIA01 Hoc; LIA02 Hoc; LIA04 Hoc; LIA07 Hoc; LIA11 Hoc; LIA12 Hoc; Gott, William; Marshall, Jane; McDermott, Brian; Morris, Scott; Thorp, John  
**Subject:** FW: NRC Contacts

FYI

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Wednesday, March 16, 2011 9:49 AM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc  
**Cc:** Marshall, Jane; Gott, William; Grant, Jeffery; Harrington, Holly; Burnell, Scott; McIntyre, David; HOO Hoc; McDermott, Brian; Mamish, Nader  
**Subject:** FW: NRC Contacts

All,

Please find below the contact information for the NRC team members in Japan. Let me know if there are any problems.

Jason Kozal

(b)(6)

---

**From:** RMTPACTSU\_AC  
**Sent:** Wednesday, March 16, 2011 9:36 AM  
**To:** RMTPACTSU\_ELNRC; RMTPACTSU\_RM  
**Cc:** RMTPACTSU\_CRC; RMTPACTSU\_DMO  
**Subject:** FW: NRC Contacts

Good morning:

Below please see the list of NRC team in Japan and their contact numbers. I will have a separate contact list for NRC, HHS and DOE teams, so that they can be shared back with their headquarters.

Regards,  
~Natalya

*Admin Coordinator  
Pacific Tsunami and Japan Earthquake Response Management Team  
USAID/DHCA/OFDA  
[Rmtpactsu\\_ac@ofda.gov](mailto:Rmtpactsu_ac@ofda.gov)  
202-712-0039*

---

**From:** Rivera, Marco  
**Sent:** Wednesday, March 16, 2011 8:11 AM  
**To:** RMTFACTSU\_AC; Sink, Amy (BFS) [USAID]  
**Cc:** DART\_PACTSU  
**Subject:** RE: NRC Contacts

All names listed have email accounts in this format--- first name.last name@nrc.gov Example is Richard.Devercelly@nrc.gov

Richard Devercelly [redacted] (b)(6)

Timothy Kolb [redacted] (b)(6)

Chuck Casto [redacted] (b)(6)

William Cook [redacted] (b)(6)

Tony Nakanishi [redacted] (b)(6)

Jack Foster [redacted] (b)(6)

James Trapp [redacted] (b)(6)

John Monninger [redacted] (b)(6)

Brooke Smith [redacted] (b)(6)

Kirk Foggie [redacted] (b)(6)

Bruce Howard [redacted] (b)(6)

NRC EMBASSY LINE- 03-3224-5066

NRC Hq Ops Center- 301-816-5100

---

**From:** RMTFACTSU\_AC  
**Sent:** Wednesday, March 16, 2011 7:33 AM  
**To:** Sink, Amy (BFS) [USAID]; Rivera, Marco  
**Subject:** NRC Contacts  
**Importance:** High

Greetings, guys:

We need BB numbers/addresses for the NRC team – ASAP.

Thanks much  
~natalya

*Admin Coordinator  
Pacific Tsunami and Japan Earthquake Response Management Team  
USAID/DHCA/OFDA*

Rmtpactsu\_ac@ofda.gov  
202-712-0039

---

**From:** PMT02 Hoc  
**Sent:** Wednesday, March 16, 2011 8:23 PM  
**To:** PMT09 Hoc  
**Subject:** FW: NRC RASCAL estimations  
**Attachments:** Unit 2, 3, 4 16MAR 0947 CM.csv; Unit 2,3,4 16MAR 0947 CM.doc

---

**From:** PMT02 Hoc  
**Sent:** Wednesday, March 16, 2011 10:10 AM  
**To:** LIA11 Hoc  
**Subject:** FW: NRC RASCAL estimations

---

**From:** PMT02 Hoc  
**Sent:** Wednesday, March 16, 2011 9:58 AM  
**To:** PMT02 Hoc; narac@llnl.gov; nitops@nnsa.doe.gov  
**Cc:** cmht@nnsa.doe.gov; Brandon, Lou  
**Subject:** RE: NRC RASCAL estimations

**--- THIS IS A MONITORING OPERATION FOR THE FUKUSHIMA REACTOR IN JAPAN ---**

**This is a MONITORING OPERATION FOR THE JAPAN EARTHQUAKE TSUNAMI AFTERMATH.**

Attached are two files for the following assumed source term (.CSV and Case Summary files), which were requested by Kevin Foster :

- Unit 2, 33% core melt, no containment
- Unit 3, 33% core melt, no containment
- Unit 4, 100% melt, source term, no containment

This is based on 917 bundles of fresh fuel.

We understand that you are engaged in other runs for DOE, et al. Our executive team has asked that this be given a very high priority to complete.

If any other NARAC runs you are doing involve projections for West Coast of the United States, please provide as soon as possible.

We expect to send another run with the entire fuel inventory from these units but the old fuel only contributes about 1% to the dose. We are QC'ing this data now.

NRC Protective Measures Team

301-816-5419

**Please reply to this email to acknowledge receipt.**

**This information should not be released at this time.**

**NO PARTICIPATION OR RESPONSE BY CMHT IS EXPECTED**

**--- THIS IS A MONITORING OPERATION FOR THE FUKUSHIMA REACTOR IN JAPAN**

---

**Subject:** Check for Rad Data  
**Location:** HOO Secure FAX

**Start:** Wed 3/16/2011 7:00 PM  
**End:** Wed 3/16/2011 7:00 PM

**Recurrence:** Daily  
**Recurrence Pattern:** every day at 7:00 PM

**Meeting Status:** Accepted

**Organizer:** LIA01 Hoc  
**Required Attendees:** LIA11 Hoc

When: Occurs every day effective 3/16/2011 at 7:00 PM (GMT-05:00) Eastern Time (US & Canada).  
Where: HOO Secure FAX

Note: The GMT offset above does not reflect daylight saving time adjustments.

\*~\*~\*~\*~\*~\*~\*~\*~\*~\*

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**Subject:** Check for Rad Data  
**Location:** Hoo Secure Fax

**Start:** Wed 3/16/2011 6:00 PM  
**End:** Wed 3/16/2011 6:30 PM

**Recurrence:** Daily  
**Recurrence Pattern:** every day from 6:00 PM to 6:30 PM

**Meeting Status:** Accepted

**Organizer:** LIA01 Hoc  
**Required Attendees:** LIA11 Hoc

When: Occurs every day effective 3/16/2011 from 6:00 PM to 6:30 PM (GMT-05:00) Eastern Time (US & Canada).  
Where: Hoo Secure Fax

Note: The GMT offset above does not reflect daylight saving time adjustments.

\*~\*~\*~\*~\*~\*~\*~\*~\*~\*



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**Subject:** Check for Rad Data  
**Location:** HOO Secure Fax

**Start:** Wed 3/16/2011 5:00 PM  
**End:** Wed 3/16/2011 5:05 PM

**Recurrence:** Daily  
**Recurrence Pattern:** every day from 5:00 PM to 5:05 PM

**Meeting Status:** Accepted

**Organizer:** LIA01 Hoc  
**Required Attendees:** LIA11 Hoc

When: Occurs every day effective 3/16/2011 from 5:00 PM to 5:05 PM (GMT-05:00) Eastern Time (US & Canada).  
Where: HOO Secure Fax

Note: The GMT offset above does not reflect daylight saving time adjustments.

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**Subject:** Check for Rad Data  
**Location:** Hoo Secure Fax

**Start:** Wed 3/16/2011 4:00 PM  
**End:** Wed 3/16/2011 4:05 PM

**Recurrence:** Daily  
**Recurrence Pattern:** every day from 4:00 PM to 4:05 PM

**Meeting Status:** Accepted

**Organizer:** LIA01 Hoc  
**Required Attendees:** LIA11 Hoc

When: Occurs every day effective 3/16/2011 from 4:00 PM to 4:05 PM (GMT-05:00) Eastern Time (US & Canada).  
Where: Hoo Secure Fax

Note: The GMT offset above does not reflect daylight saving time adjustments.

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**Subject:** Check for Rad Data  
**Location:** HOO Secure Fax

**Start:** Wed 3/16/2011 3:00 PM  
**End:** Wed 3/16/2011 3:05 PM

**Recurrence:** Daily  
**Recurrence Pattern:** every day from 3:00 PM to 3:05 PM

**Meeting Status:** Accepted

**Organizer:** LIA01 Hoc  
**Required Attendees:** LIA11 Hoc

When: Occurs every day effective 3/16/2011 from 3:00 PM to 3:05 PM (GMT-05:00) Eastern Time (US & Canada).  
Where: HOO Secure Fax

Note: The GMT offset above does not reflect daylight saving time adjustments.

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**Subject:** Check for Rad Data  
**Location:** Hoo Secure Fax

**Start:** Wed 3/16/2011 2:00 PM  
**End:** Wed 3/16/2011 2:05 PM

**Recurrence:** Daily  
**Recurrence Pattern:** every day from 2:00 PM to 2:05 PM

**Meeting Status:** Accepted

**Organizer:** LIA01 Hoc  
**Required Attendees:** LIA11 Hoc

When: Occurs every day effective 3/16/2011 from 2:00 PM to 2:05 PM (GMT-05:00) Eastern Time (US & Canada).  
Where: Hoo Secure Fax

Note: The GMT offset above does not reflect daylight saving time adjustments.

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**Subject:** Check for Rad Data  
**Location:** Hoo Secure FAX

**Start:** Wed 3/16/2011 1:00 PM  
**End:** Wed 3/16/2011 1:05 PM

**Recurrence:** Daily  
**Recurrence Pattern:** every day from 1:00 PM to 1:05 PM

**Meeting Status:** Accepted

**Organizer:** LIA01 Hoc  
**Required Attendees:** LIA11 Hoc

When: Occurs every day effective 3/16/2011 from 1:00 PM to 1:05 PM (GMT-05:00) Eastern Time (US & Canada).  
Where: Hoo Secure FAX

Note: The GMT offset above does not reflect daylight saving time adjustments.

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**Subject:** Check for Rad Data  
**Location:** HOO Secure Fax

**Start:** Wed 3/16/2011 12:00 PM  
**End:** Wed 3/16/2011 12:05 PM

**Recurrence:** Daily  
**Recurrence Pattern:** every day from 12:00 PM to 12:05 PM

**Meeting Status:** Accepted

**Organizer:** LIA01 Hoc  
**Required Attendees:** LIA11 Hoc

When: Occurs every day effective 3/16/2011 from 12:00 PM to 12:05 PM (GMT-05:00) Eastern Time (US & Canada).  
Where: HOO Secure Fax

Note: The GMT offset above does not reflect daylight saving time adjustments.

\*~\*~\*~\*~\*~\*~\*~\*~\*~\*

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 9:32 AM  
**To:** RMPACTSU\_ELNRC  
**Subject:** RE: Fax from 0332245880

**Categories:** FOIA

The HOO and international liaison is working on finding out who sent this, the second FAX looks like it is from France. Contact the international liaison for more information.

-----Original Message-----

From: RMPACTSU\_ELNRC [mailto:RMPACTSU\_ELNRC@ofda.gov]  
Sent: Wednesday, March 16, 2011 8:50 AM  
To: HOO Hoc; RST01 Hoc; PMT01 Hoc; LIA01 Hoc; LIA02 Hoc; LIA04 Hoc; LIA07 Hoc; LIA11 Hoc; LIA12 Hoc; Gott, William; Marshall, Jane; McDermott, Brian; Morris, Scott; Thorp, John  
Subject: RE: Fax from 0332245880

Thanks..need to know if this is an official request from the Government of Japan (GoJ).

-----Original Message-----

From: HOO Hoc [mailto:HOO.Hoc@nrc.gov]  
Sent: Wednesday, March 16, 2011 8:49 AM  
To: RMPACTSU\_ELNRC; RST01 Hoc; PMT01 Hoc; LIA01 Hoc; LIA02 Hoc; LIA04 Hoc; LIA07 Hoc; LIA11 Hoc; LIA12 Hoc; Gott, William; Marshall, Jane; McDermott, Brian; Morris, Scott; Thorp, John  
Subject: RE: Fax from 0332245880

There was nothing more than the fax equipment request . . . no cover sheet, just the fax number. Skip Young is trying to track this down.

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

-----Original Message-----

From: RMPACTSU\_ELNRC [mailto:RMPACTSU\_ELNRC@ofda.gov]  
Sent: Wednesday, March 16, 2011 8:44 AM  
To: LIA11 Hoc  
Cc: HOO Hoc  
Subject: RE: Fax from 0332245880

Was this all that came over? Was there a cover letter as well or a transmittal document?

-----Original Message-----

From: LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
Sent: Wednesday, March 16, 2011 8:40 AM  
To: RMTFACTSU\_ELNRC  
Subject: FW: Fax from 0332245880

-----Original Message-----

From: HOO Hoc  
Sent: Wednesday, March 16, 2011 7:36 AM  
To: ET07 Hoc; PMT01 Hoc; RST01 Hoc; LIA01 Hoc; LIA02 Hoc; LIA04 Hoc;  
LIA07 Hoc; LIA11 Hoc; LIA12 Hoc  
Cc: HOO Hoc  
Subject: FW: Fax from 0332245880

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

-----Original Message-----

From: hoo1 [mailto:hoo1.hoc@nrc.gov]  
Sent: Wednesday, March 16, 2011 5:50 AM  
To: HOO Hoc  
Subject: Fax from 0332245880

RECEIVE NOTIFICATION FOR JOB 00017720

Notice for: HOO1

Remote ID: 0332245880

Received at: 03/16/2011 05:48

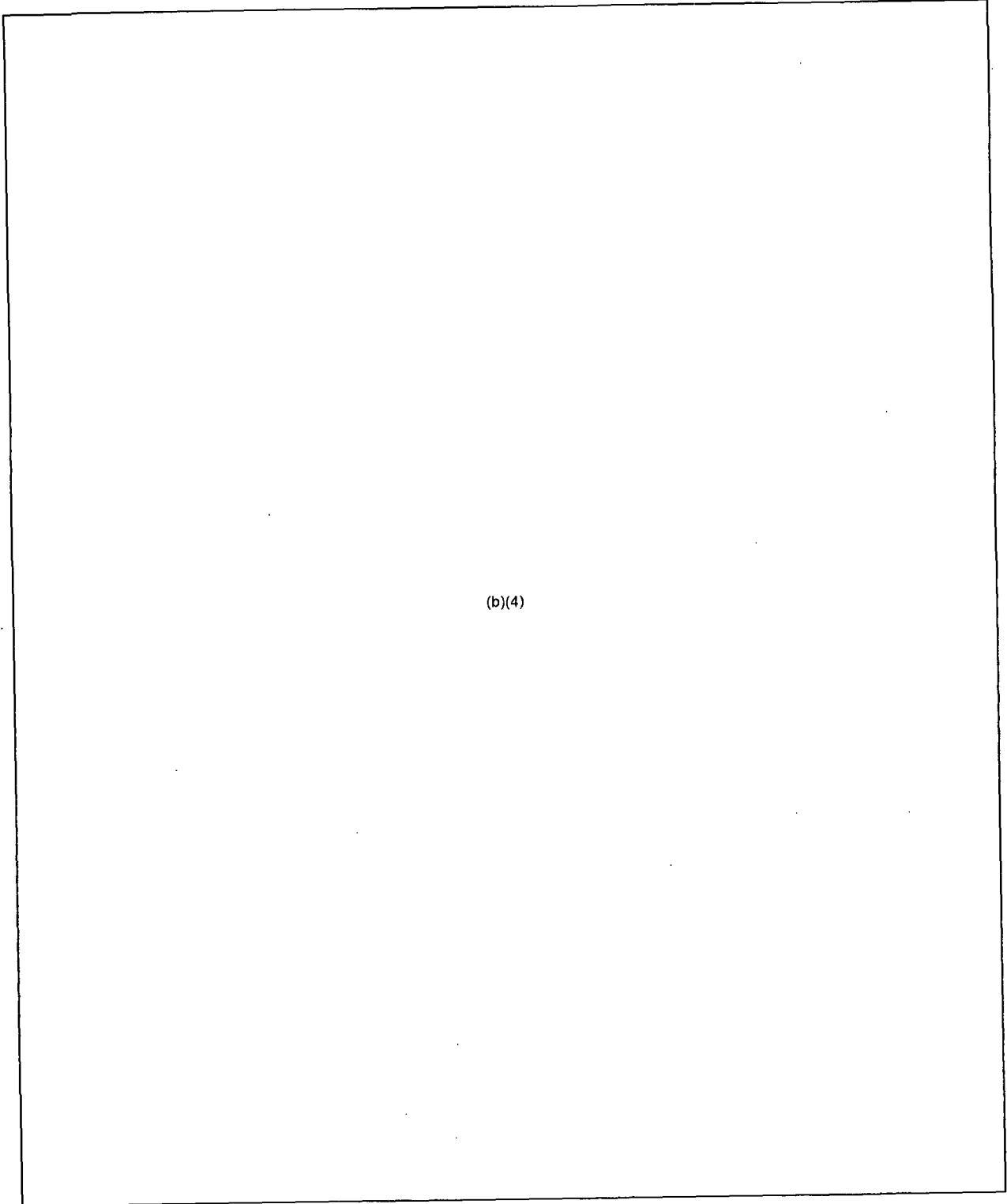
Pages: 2

Routed by:

Routed at: 03/16/2011 05:48

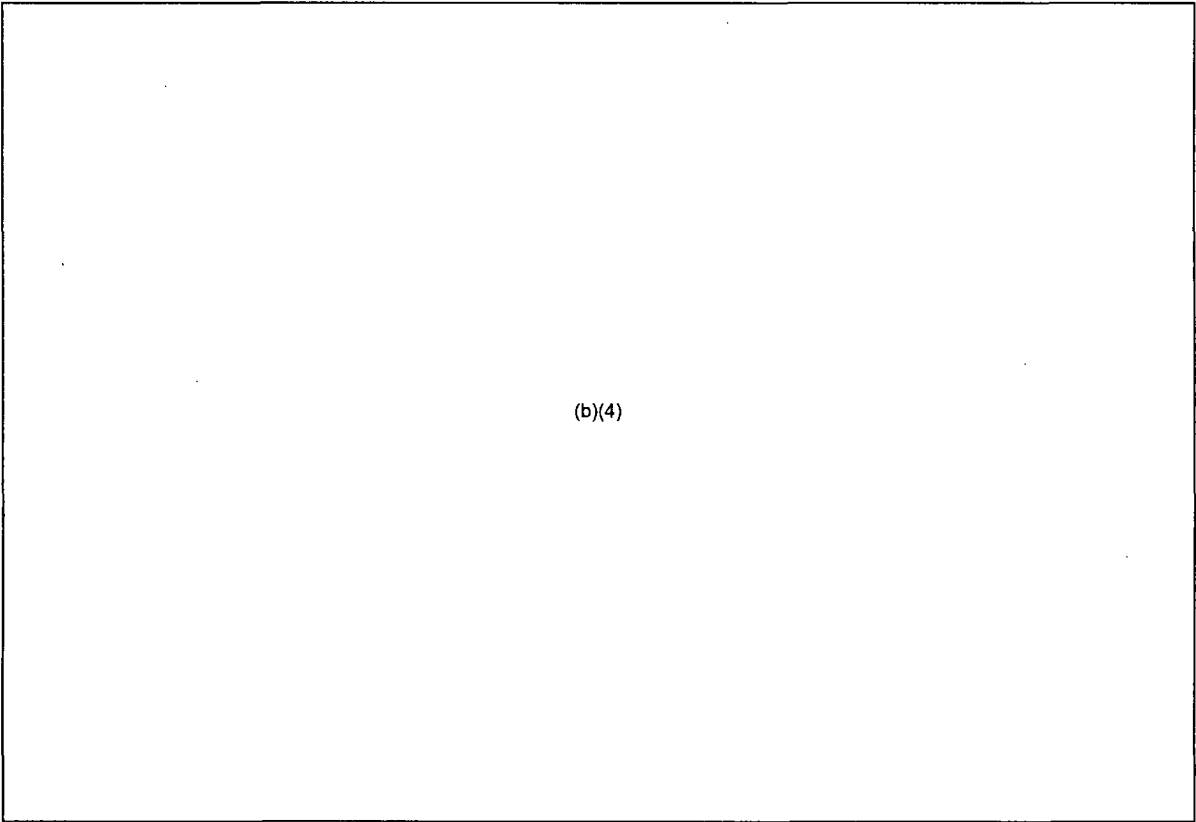


List of requests to the US Government



(b)(4)

~~Confidential Level 2~~  
Tentative



(b)(4)

---

**Subject:** Check for Rad Data  
**Location:** HOO Secure FAX

**Start:** Wed 3/16/2011 10:00 AM  
**End:** Wed 3/16/2011 10:05 AM

**Recurrence:** Daily  
**Recurrence Pattern:** every day from 10:00 AM to 10:05 AM

**Meeting Status:** Accepted

**Organizer:** LIA01 Hoc  
**Required Attendees:** LIA11 Hoc

**Categories:** FOIA

When: Occurs every day effective 3/16/2011 from 10:00 AM to 10:05 AM (GMT-05:00) Eastern Time (US & Canada).  
Where: HOO Secure FAX

Note: The GMT offset above does not reflect daylight saving time adjustments.

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**Subject:** Check for Rad Data  
**Location:** Hoo Secure FAX

**Start:** Wed 3/16/2011 11:00 AM  
**End:** Wed 3/16/2011 11:05 AM

**Recurrence:** Daily  
**Recurrence Pattern:** every day from 11:00 AM to 11:05 AM

**Meeting Status:** Accepted

**Organizer:** LIA01 Hoc  
**Required Attendees:** LIA11 Hoc

**Categories:** FOIA

When: Occurs every day effective 3/16/2011 from 11:00 AM to 11:05 AM (GMT-05:00) Eastern Time (US & Canada).  
Where: Hoo Secure FAX

Note: The GMT offset above does not reflect daylight saving time adjustments.

\*~\*~\*~\*~\*~\*~\*~\*~\*~\*

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**Subject:** Check HOO for PMT  
**Start:** Wed 3/16/2011 11:00 AM  
**End:** Wed 3/16/2011 11:30 AM  
**Recurrence:** (none)  
**Organizer:** LIA11 Hoc

---

**Subject:** Check HOO for PMT  
**Start:** Wed 3/16/2011 10:00 AM  
**End:** Wed 3/16/2011 10:30 AM  
**Recurrence:** (none)  
**Organizer:** LIA11 Hoc

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 8:49 AM  
**To:** RMTFACTSU\_ELNRC  
**Subject:** FW: 21:00 SPEEDI Data  
**Attachments:** FUKUSHIMA1 21h.zip  
  
**Categories:** FOIA

FYI

-----Original Message-----

From: HOO Hoc  
Sent: Wednesday, March 16, 2011 8:48 AM  
To: RST01 Hoc; PMT01 Hoc; ET07 Hoc; LIA01 Hoc; LIA02 Hoc; LIA04 Hoc; LIA07 Hoc; LIA11 Hoc; LIA12 Hoc; Gott, William; Marshall, Jane; McDermott, Brian; Morris, Scott; Thorp, John  
Subject: FW: 21:00 SPEEDI Data

FYI

-----Original Message-----

From: JapanEmbassy, TaskForce [mailto:JapanEmbassyTaskForce@state.gov]  
Sent: Wednesday, March 16, 2011 8:47 AM

To: [redacted] (b)(6)

[redacted] (b)(6)

Subject: 21:00 SPEEDI Data

Attached please find 21:00 SPEEDI Data. □

SBU

This email is UNCLASSIFIED

Naomi Walcott  
Emergency Action Officer  
Japan Emergency Command Center  
U.S. Embassy Tokyo

-----Original Message-----

From: nustec [mailto:spd01@nustec.or.jp]  
Sent: Wednesday, March 16, 2011 9:27 PM

To: [redacted] (b)(6)

[redacted] (b)(6)

(b)(6)

Subject: 21時SPEEDI単位量放出図形イメージの送付

関係者各位

お世話になっております。

原子力安全技術センター 水野です。

3/16 21時のSPEEDI単位量放出図形のイメージデータを送付致します。

ご確認のほど、よろしくお願い致します。



Attachment FUKUSHIMA1 21h.zip(454090 bytes ) cannot be converted to PDF format.

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 7:36 AM  
**To:** LIA01 Hoc  
**Subject:** test  
  
**Categories:** FOIA

---

**From:** Ralston, Michelle <Michelle.Ralston@dhs.gov>  
**Sent:** Wednesday, March 16, 2011 6:40 AM  
**To:** Quinn, Vanessa; Greten, Timothy; Horwitz, Steve; O'Boyle, Seamus; Connell, Renae; Burnside, Conrad; Calhoun, Nan; Colman, Steve; Feighert, Dan; Fiore, craig; Hammond, Lisa; Hammons, Darrell; Hlavaty-Laposa, Jan ; King, William; McCabe, Ron; Thomson, Rebecca; Webb, Bill  
**Cc:** LIA11 Hoc  
**Subject:** FW: Statement from California's Department of Public Health and Emergency Management Agency on Risk of Radiation Exposure  
  
**Categories:** FOIA, Red Category

Thought this might be of interest. Thanks.

Respectfully,

**Michelle Ralston, MS, PMI**  
Public Affairs, Stakeholder Outreach & Campaign Planning  
Professional Services & Integration  
Technological Hazards Division  
Protection & National Preparedness  
DHS/FEMA  
1800 South Bell Street, Rm. 828  
Arlington, VA 22202  
(202) 212-2310 desk  
(b)(6) Blackberry  
(703) 305-0837 facsimile

---

**From:** Fiore, Craig  
**Sent:** Wednesday, March 16, 2011 5:30 AM  
**To:** Walz, Kim  
**Cc:** Lusk, Jeff; Ralston, Michelle; Sherwood, Harry  
**Subject:** Fw: Statement from California's Department of Public Health and Emergency Management Agency on Risk of Radiation Exposure

Kim,

Here is a public health information release issued from CDPH. I suspect you were on the original distro list, but I just want to be sure you had visibility on this.

-Craig

-----  
Sent from the BlackBerry of Craig J. Fiore

---

**From:** Lee Shin <Lee.Shin@calema.ca.gov>  
**To:** 'sarah.hartson@oak.doe.gov' <sarah.hartson@oak.doe.gov>; 'Bill.Maier@nrc.gov' <Bill.Maier@nrc.gov>; 'craig.fiore@dhs.gov' <craig.fiore@dhs.gov>; 'meer.daniel@epa.gov' <meer.daniel@epa.gov>  
**Sent:** Wed Mar 16 05:20:20 2011  
**Subject:** Statement from California's Department of Public Health and Emergency Management Agency on Risk of Radiation Exposure

---

**From:** Jordan Scott  
**To:** CalEMA Distribution Group  
**Sent:** Tue Mar 15 18:42:07 2011  
**Subject:** NEWS: Statement from California's Department of Public Health and Emergency Management Agency on Risk of Radiation Exposure

## **Statement from California's Department of Public Health and Emergency Management Agency on Risk of Radiation Exposure**

SACRAMENTO - Today the interim director of the California Department of Public Health, Dr. Howard Backer, and acting secretary of the California Emergency Management Agency, Mike Dayton, issued the following statement emphasizing Californians' safety from radiation exposure and the risks of taking potassium iodide as a precautionary measure.

"The safety of all Californians is our highest priority, and we are in constant contact with the federal agencies responsible for monitoring radiation levels across the West Coast.

We want to emphasize that the U.S. Environmental Protection Agency, the Nuclear Regulatory Commission and the U.S. Department of Health and Human Services have all stated that there is no risk expected to California or its residents as a result of the situation in Japan.

We are actively monitoring the situation in Japan and are ready to take all steps necessary to protect Californians should risks develop.

We urge Californians to not take potassium iodide as a precautionary measure. It is not necessary given the current circumstances in Japan, it can present a danger to people with allergies to iodine, shellfish or who have thyroid problems, and taken inappropriately it can have serious side effects including abnormal heart rhythms, nausea, vomiting, electrolyte abnormalities and bleeding.

Our thoughts are with the people of Japan at this tragic time."

*Californians with questions about radiation exposure can contact the California Department of Public Health's Emergency Operations information line at 916 341-3947.*

*For updated information on monitoring, response and relief efforts in California and Japan, please visit the California Emergency Management Agency website at [www.calema.ca.gov](http://www.calema.ca.gov).*

###

**Jordan Scott**  
California Emergency Management Agency  
Office of Public Information  
Desk: 916 845-8445  
Cell: 916 825-7088  
[Jordan.Scott@calema.ca.gov](mailto:Jordan.Scott@calema.ca.gov)

---

**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Wednesday, March 16, 2011 2:38 AM  
**To:** LIA11 Hoc; LIA01 Hoc  
**Subject:** DOE POC in the DART

**Categories:** FOIA, Red Category

I was given this contact info:

Ron Cherry  
(81) 90-2167-9836

---

**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Wednesday, March 16, 2011 1:54 AM  
**To:** LIA11 Hoc  
**Subject:** RE: status report  
  
**Categories:** FOIA, Red Category

Who is leading the DART team?  
Bill Berger

Who is second in control?  
Courtney Brown

How many people are on the team?  
Currently 210 (including search/rescue, NRC, DOE, HHS, etc.)

What is the leadership contact information?  
In order to minimize contact with the primary points of contact, communications are done with the response management team here in DC. If you need to contact them, let me know and I will set it up.

---

**From:** LIA11 Hoc  
**Sent:** Wednesday, March 16, 2011 1:27 AM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** RE: status report

**Categories:** FOIA

Jeff K:

Who is leading the DART team? Who is second in control? How many people are on the team? What is the leadership contact information?

Jeff Lynch  
301-816-5208

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Wednesday, March 16, 2011 12:38 AM  
**To:** LIA11 Hoc; LIA01 Hoc  
**Subject:** status report

Could you please provide the most up to date NRC status report. We have the 1930 one. Thanks.

Jeff K

---

**From:** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 11:55 PM  
**To:** LIA02 Hoc; LIA03 Hoc  
**Subject:** FW: eCC - [INFO ONLY, NO ACTION] - Itinerary #622049/Casto(+) REQUEST GRANTED, ARRIVAL: 3/16/2011

**Categories:** FOIA

Clearance Info

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Tuesday, March 15, 2011 11:50 PM  
**To:** LIA11 Hoc; LIA01 Hoc  
**Subject:** FW: eCC - [INFO ONLY, NO ACTION] - Itinerary #622049/Casto(+) REQUEST GRANTED, ARRIVAL: 3/16/2011

Is this what you're looking for? Thanks.

---

**From:** RMTPACTSU\_AC  
**Sent:** Tuesday, March 15, 2011 7:54 PM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** FW: eCC - [INFO ONLY, NO ACTION] - Itinerary #622049/Casto(+) REQUEST GRANTED, ARRIVAL: 3/16/2011

FYI: approved country clearances for 9-member NRC team.

~Natalya

*Admin Coordinator  
Pacific Tsunami and Japan Earthquake Response Management Team  
USAID/DHCA/OFDA  
Rmtpactsu\_ac@ofda.gov  
202-712-0039*

---

**From:** ecc@state.gov [mailto:ecc@state.gov]  
**Sent:** Tuesday, March 15, 2011 7:50 PM  
**To:** RMTPACTSU\_AC  
**Subject:** eCC - [INFO ONLY, NO ACTION] - Itinerary #622049/Casto(+) REQUEST GRANTED, ARRIVAL: 3/16/2011

## Request Summary

Itinerary #:622049

Date Requested:3/15/2011

Request Summary

| Travel Itinerary    |                    |            |           |          |
|---------------------|--------------------|------------|-----------|----------|
| Destination Country | Destination Cities | Start Date | End Date  | Status   |
| JAPAN               | Tokyo              | 3/16/2011  | 4/11/2011 | APPROVED |

---

**Travelers**



**Name:** Charles A Casto  
**Contact Info:** (b)(6)  
**Country of Birth:** (b)(6)  
**Emergency Contact:**  
**Clearance:** (b)(6)  
**Clearance Verification:**  
**Additional Info:**

**Agency:** Nuclear Regulatory Commission  
**Employment Type:** Direct Hire  
**Passport Type:** Personal  
**Passport #:** (b)(6)  
**Passport Country:** USA

**Name:** William A Cook  
**Contact Info:** (b)(6)  
**Country of Birth:** (b)(6)  
**Emergency Contact:**  
**Clearance:** (b)(6)  
**Clearance Verification:**  
**Additional Info:**

**Agency:** Nuclear Regulatory Commission  
**Employment Type:** Direct Hire  
**Passport Type:** Personal  
**Passport #:** (b)(6)  
**Passport Country:** USA

**Name:** Richard W Devercelly  
**Contact Info:** (b)(6)  
(b)(6)  
**Country of Birth:** (b)(6)  
**Emergency Contact:**  
**Clearance:** (b)(6)  
**Clearance Verification:**  
**Additional Info:**

**Agency:** Nuclear Regulatory Commission  
**Employment Type:** Direct Hire  
**Passport Type:** Personal  
**Passport #:** (b)(6)  
**Passport Country:** USA

**Name:** Kirk R Foggie  
**Contact Info:** (b)(6) [kirk.foggie@nrc.gov](mailto:kirk.foggie@nrc.gov)  
**Country of Birth:** (b)(6)  
**Emergency Contact:**  
**Clearance:** (b)(6)  
**Clearance Verification:**  
**Additional Info:**

**Agency:** Nuclear Regulatory Commission  
**Employment Type:** Direct Hire  
**Passport Type:** Official  
**Passport #:** (b)(6)  
**Passport Country:** USA

**Name:** Jack W Foster  
**Contact Info:** (b)(6) [jack.foster@nrc.gov](mailto:jack.foster@nrc.gov)  
**Country of Birth:** (b)(6)  
**Emergency Contact:**  
**Clearance:** (b)(6)  
**Clearance Verification:**  
**Additional Info:**

**Agency:** Nuclear Regulatory Commission  
**Employment Type:** Direct Hire  
**Passport Type:** Personal  
**Passport #:** (b)(6)  
**Passport Country:** USA

**Name:** Timothy C Kolb  
**Contact Info:** (b)(6) [timothy.kolb@nrc.gov](mailto:timothy.kolb@nrc.gov)  
**Country of Birth:** (b)(6)  
**Emergency Contact:**  
**Clearance:** (b)(6)  
**Clearance Verification:**  
**Additional Info:**

**Agency:** Nuclear Regulatory Commission  
**Employment Type:** Direct Hire  
**Passport Type:** Personal  
**Passport #:** (b)(6)  
**Passport Country:** USA

**Name:** John D Monninger  
**Contact Info:** (b)(6)  
(b)(6)  
**Country of Birth:** (b)(6)

**Agency:** Nuclear Regulatory Commission  
**Employment Type:** Direct Hire  
**Passport Type:** Official

**Emergency Contact:**  
**Clearance:** (b)(6)  
**Clearance Verification:**  
**Additional Info:**

**Passport #:** (b)(6)  
**Passport Country:** USA

**Name:** Tony T Nakanishi  
**Contact Info:** (b)(6)  
**Country of Birth:** (b)(6)  
**Emergency Contact:**  
**Clearance:** (b)(6)  
**Clearance Verification:**  
**Additional Info:**

**Agency:** Nuclear Regulatory Commission  
**Employment Type:** Direct Hire  
**Passport Type:** Personal  
**Passport #:** (b)(6)  
**Passport Country:** USA

**Name:** Amy Sink  
**Contact Info:** (b)(6) [asink@usaid.gov](mailto:asink@usaid.gov)  
**Country of Birth:** (b)(6)  
**Emergency Contact:** (b)(6)  
**Clearance:** (b)(6)  
**Clearance Verification:** USAID  
**Additional Info:**

**Agency:** U.S. Agency for International Development  
**Employment Type:** Direct Hire  
**Passport Type:** Diplomatic  
**Passport #:** (b)(6)  
**Passport Country:** USA

**Name:** Brooke G Smith  
**Contact Info:** (b)(6) [brooke.smith@nrc.gov](mailto:brooke.smith@nrc.gov)  
**Country of Birth:** (b)(6)  
**Emergency Contact:**  
**Clearance:** (b)(6)  
**Clearance Verification:**  
**Additional Info:**  
**Other Group Members:**  
*None*

**Agency:** Nuclear Regulatory Commission  
**Employment Type:** Direct Hire  
**Passport Type:** Personal  
**Passport #:** (b)(6)  
**Passport Country:** USA

**Carrier Information**

| Carrier and # | Mode | Departure Point  | Departure Date/Time   | Arrival Point | Arrival Date/Time    |
|---------------|------|------------------|-----------------------|---------------|----------------------|
| DL 0275       | AIR  | Chattanooga, TN  | 3/15/2011 11:15:00 AM | Narita        | 3/16/2011 4:15:00 PM |
| BA 0005       | AIR  | Washington, DC   | 3/14/2011 11:05:00 PM | Narita        | 3/16/2011 9:10:00 AM |
| BA005         | AIR  | Philadelphia, PA | 3/14/2011 10:25:00 AM | Narita        | 3/16/2011 9:10:00 AM |

**Request Details**

| JAPAN          |                      |              |                |          |
|----------------|----------------------|--------------|----------------|----------|
| Clearance From | Agency/Section/Other | Arrival Date | Departure Date | Status   |
| JAPAN/TOKYO    | USAID                | 3/16/2011    | 4/11/2011      | APPROVED |

**Other Posts & Sections to be Informed**

| Post                                            | Section |
|-------------------------------------------------|---------|
| Destination Cities Tokyo                        |         |
| VIP Visit? No                                   |         |
| Purpose of Visit Provide disaster assistance in |         |

**Access to Building Required?** Yes  
**POC at post** John Beed  
**Access to PCC Required?** No  
**Fiscal Data:** *None*

response to Disaster Declaration on 03/11/2011.

**Other Comments/Remarks:** *None*

**Hotel Reservations?** No

**Airport Assistance/Transportation?** No

**Accompanying Pouch?** No

**Appointment Request?** No

**Other Needed Assistance?** No

| Hotel Accommodations |                |        |      |                   |                |
|----------------------|----------------|--------|------|-------------------|----------------|
| Hotel Name           | Street Address | City   | Rate | Local Telephone # | Confirmation # |
|                      |                | (b)(6) |      |                   |                |

**Control Officer:** John A. Beed

**Post:** TOKYO

**Email:** [BeedJA@state.gov](mailto:BeedJA@state.gov)

**Phone:** 81-3-3224-5015

**Airport Assistance**

**/ Transportation:**

**Appointment**

**Request:**

**Expediter:**

**Other Provided**

**Assistance:**

**Comments:**

---

**List of recipients:**

[ACTION]-REQUEST APPROVER:

[yamakirx@state.gov](mailto:yamakirx@state.gov)

[beedja@state.gov](mailto:beedja@state.gov)

[INFO]-COUNTRY DESK:

[williamsqe@state.gov](mailto:williamsqe@state.gov)

[kelleyk@state.gov](mailto:kelleyk@state.gov)

[INFO]-GROUP CC:

[miyajimacx@state.gov](mailto:miyajimacx@state.gov)

[horowitzpd@state.gov](mailto:horowitzpd@state.gov)

[bergermc@state.gov](mailto:bergermc@state.gov)

[kataqirinx@state.gov](mailto:kataqirinx@state.gov)

[vizcarraj@state.gov](mailto:vizcarraj@state.gov)

[INFO]-REQUESTOR CC:

[travel@ofda.gov](mailto:travel@ofda.gov)

[rmtfactsu\\_ac@ofda.gov](mailto:rmtfactsu_ac@ofda.gov)

[jbeed@usaid.gov](mailto:jbeed@usaid.gov)

---

**From:** Anderson, Joseph  
**Sent:** Tuesday, March 15, 2011 8:35 PM  
**To:** LIA11 Hoc; Mroz (Sahm), Sara; Anderson, James  
**Subject:** FW: Report: Surgeon General Recommends KI as a Precaution for West Coast Residents

**Categories:** FOIA

FYI

---

**Subject:** Report: Surgeon General Recommends KI as a Precaution for West Coast Residents

**This is posted on the Drudge Report:**

U.S. Surgeon General Supports Buying KI as Precaution for West Coast Residents

\*\*The fear that a nuclear cloud could float from the shores of Japan to the shores of California has some people making a run on iodine tablets.

\*\*Pharmacists across California report being flooded with requests.

Counter to state and county officials who Tuesday tried to keep people calm by saying that getting the pills wasn't necessary, U.S. Surgeon General Regina Benjamin supported the idea as a worthy "precaution."

NBC Bay Area reporter Damian Trujillo asked her about the run on tablets and Dr. Benjamin said although she wasn't aware of people stocking up, she did not think that would be an overreaction. She said it was right to be prepared.

On the other side of the issue is Kelly Huston of the California Emergency Management Agency. Huston said state officials, along with the Nuclear Regulatory Commission and the California Energy Commission, were monitoring the situation and said people don't need to buy the pills.

"Even if we had a radiation release from Diablo Canyon (in San Luis Obispo County), iodide would only be issued to people living within a 10-mile radius of the plant," Huston added.

Santa Clara County's public health officer Dr. Martin Fenstersheib told the Mercury News he also does not recommend getting the tablets, adding some people can be severely allergic to the iodine.

"There is no reason for doing it," Fenstersheib told the paper.

Either way, the pills are hard to get. eBay prices have skyrocketed.

**NEI Message:**

In 2001, the NRC revised its emergency planning regulations for nuclear power reactors to provide states the option to use potassium iodide (KI) tablets as a secondary protective measure for the public. KI would supplement evacuation and sheltering in the event of a nuclear reactor accident. If taken within several hours of exposure to radioactive iodine, KI can protect the thyroid gland. KI does not protect any other part of the body, nor does it protect against any other radioactive element.

---

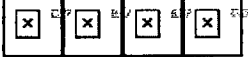
[1] U.S. Nuclear Regulatory Commission final rule, "Consideration of Potassium Iodide in Emergency Plans" (66 Federal Register 5427, Jan. 19, 2001).

[2] Under the U.S. Department of Homeland Security's National Response Plan, a nuclear plant security event classified at the alert level or higher is an incident of national significance. Federal resources may be made available to assist with emergency response if state and local resources are overwhelmed.

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Sent through mail.messaging.microsoft.com

---

**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Tuesday, March 15, 2011 8:24 PM  
**To:** LIA11 Hoc; LIA01 Hoc  
**Subject:** Checking in

**Categories:** FOIA

FYI Chuck Teal and Jeff Kowalczyk are now on shift at USAID downtown until 7 am. Jeff's cell phone is (b)(6).  
(b)(6). Thanks.

---

**From:** NICC <Nicc@dhs.gov>  
**Sent:** Tuesday, March 15, 2011 7:10 PM  
**Subject:** Situational Awareness Report - Magnitude 9.0 Earthquake 80 miles offshore  
Northeastern Japan - 15 Mar 11

**Categories:** FOIA

All,

For your situational awareness:

**Critical Infrastructure effects:** Impacts to Critical Infrastructure are unknown at this time

The NICC is monitoring reports of a fire at the Fukushima Daichi Plant.

- The Japanese Ministry of Foreign Affairs reported a new fire began at the northeastern corner of the reactor four building at approximately 1645 EDT
- The Japanese government is seeking U.S. government assistance in containing the fire, including personnel with hazmat suits
- Two fire trucks are at the plant, but the Tokyo Electric Power Company does not have any staff to operate them

The NICC anticipates further reporting on this incident as the situation develops.

**\* This information is based on initial reporting and is being provided for your situational awareness. Initial reporting may have inaccuracies due to a rapidly developing situation and is subject to change.**

If you have any questions or concerns, please feel free to contact the NICC at 202-282-9201 or [NICC@dhs.gov](mailto:NICC@dhs.gov). Thank you.

V/r,

(b)(6)

NICC Watch Operations  
Department of Homeland Security  
202-282-9201  
Email: [nicc@dhs.gov](mailto:nicc@dhs.gov)  
HSDN: [tsa.nicc@dhs.gov](mailto:tsa.nicc@dhs.gov)  
JWICS: [nicc.watch@tsa.ic.gov](mailto:nicc.watch@tsa.ic.gov)

For more information on the NICC go to:  
[DHS National Infrastructure Coordinating Center](#)

Distro List:  
Situational Awareness Base List

NICC SWO  
NICC Support  
OPS CAT  
PSA HI  
PSA Southwest Region



---

**From:** Quinn, Vanessa <Vanessa.Quinn@dhs.gov>  
**Sent:** Tuesday, March 15, 2011 4:57 PM  
**To:** Mroz (Sahm), Sara  
**Subject:** RE: Regional Media

ok

---

**From:** prvs=048802822=Sara.Mroz@nrc.gov [mailto:prvs=048802822=Sara.Mroz@nrc.gov] **On Behalf Of** Mroz (Sahm), Sara  
**Sent:** Tuesday, March 15, 2011 4:39 PM  
**To:** Anderson, Joseph; Wright, Lisa (Gibney); 'michelle.ralston@dhs.gov'; LIA01 Hoc; LIA11 Hoc  
**Cc:** 'harry.sherwood@dhs.gov'; 'vanessa.quinn@dhs.gov'  
**Subject:** RE: Regional Media

Ken Weirman is here with us. I asked him to call Michelle and coordinate info transfer as necessary.  
-Sara

---

**From:** Anderson, Joseph  
**Sent:** Tuesday, March 15, 2011 2:35 PM  
**To:** Wright, Lisa (Gibney); 'michelle.ralston@dhs.gov'; Mroz (Sahm), Sara; LIA01 Hoc; LIA11 Hoc  
**Cc:** 'harry.sherwood@dhs.gov'; 'vanessa.quinn@dhs.gov'  
**Subject:** Re: Regional Media

Michelle - Primary POC, with the NRC OPS Center activated, needs to be the Liaison Desk to ensure effective coordination. Thanks.

---

**From:** Wright, Lisa (Gibney)  
**To:** 'Michelle.ralston@dhs.gov' <Michelle.ralston@dhs.gov>; Mroz (Sahm), Sara; LIA01 Hoc; LIA11 Hoc  
**Cc:** Anderson, Joseph  
**Sent:** Tue Mar 15 14:30:58 2011  
**Subject:** Re: Regional Media

That would be helpful. If you can also send it to our Liaison desk in the Ops Center they can screen as needed. I added that position to this email too.

Thanks

Sent from my NRC blackberry

Lisa Gibney

To reach me please call

(b)(6)

---

**From:** Ralston, Michelle <Michelle.Ralston@dhs.gov>  
**To:** Wright, Lisa (Gibney); Mroz (Sahm), Sara  
**Cc:** Anderson, Joseph  
**Sent:** Tue Mar 15 13:48:25 2011  
**Subject:** Regional Media

Lisa/Sara,

We are getting a lot of information from our Regions on what is playing out locally in the media. Would you like for me to share some of that with you?

Thanks.

Respectfully,

**Michelle Ralston, MS, PMI**  
Public Affairs, Stakeholder Outreach & Campaign Planning  
Professional Services & Integration  
Technological Hazards Division  
Protection & National Preparedness  
DHS/FEMA  
1800 South Bell Street, Rm. 828  
Arlington, VA 22202  
(202) 212-2310 desk  
(b)(6) Blackberry  
(703) 305-0837 facsimile

---

**From:** RMPACTSU\_ELNRC <RMPACTSU\_ELNRC@ofda.gov>  
**Sent:** Tuesday, March 15, 2011 4:34 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc; LIA08 Hoc; Harrington, Holly; McIntyre, David; Burnell, Scott; Taylor, Robert; Gott, William; Grant, Jeffery; Marshall, Jane  
**Subject:** FYI - VOA Editorial - pls clear by 11am TUESDAY  
**Attachments:** VOA Updated - U S Aids Japan.rtf  
**Categories:** FOIA

**Subject:** FW: FOR HEATHER --VOA Editorial - pls clear by 11am TUESDAY

RG and All—The attached VOA editorial came through the Task Force and includes info on OFDA response. Can you clear on this?

Cc'ing TaskForce so everyone's kept in the loop.

Hope all is well over there!

Many thanks,  
Elizabeth Stickman

USAID/OFDA Liaison to State Japan Task Force  
202-647-6611

---

**From:** Forino, Nini J  
**Sent:** Tuesday, March 15, 2011 3:40 PM  
**To:** zTask Force 1 Mailbox  
**Cc:** McKellogg, Kelly E  
**Subject:** FOR HEATHER --VOA Editorial - pls clear by 11am TUESDAY

Heather, I had meant to clear this with our AID rep. Could you make sure someone gets back to Kelly? Thanks, Nini  
Nini Forino  
Public Diplomacy Officer  
Country Coordinator for Japan and  
Korea  
Office of Japan and Korea Affairs  
(202) 647-4743  
[Forinonj@state.gov](mailto:Forinonj@state.gov)

Sent from my Blackberry

---

**From:** McKellogg, Kelly E  
**Sent:** Tuesday, March 15, 2011 01:03 PM  
**To:** Forino, Nini J  
**Subject:** FW: VOA Editorial - pls clear by 11am TUESDAY

SBU  
This email is UNCLASSIFIED.

---

**From:** McKellogg, Kelly E  
**Sent:** Tuesday, March 15, 2011 10:33 AM  
**To:** zTask Force 1 Mailbox  
**Cc:** EAP-P-Office-DL; Campbell, Todd A; Green, Christopher L  
**Subject:** FW: VOA Editorial - pls clear by 11am TUESDAY

TF colleagues – VOA is pressing for this, so let me know ASAP if you have any edits. USAID has cleared. Thanks, Kelly

SBU  
This email is UNCLASSIFIED.

---

**From:** Schuchat, Simon J  
**Sent:** Monday, March 14, 2011 5:02 PM  
**To:** zTask Force 1 Mailbox  
**Cc:** EAP-J-Office-DL; EAP-P-Office-DL  
**Subject:** FW: VOA Editorial - pls clear by 11am TUESDAY

Task Force colleagues :

Please fact check the attached VOA editorial and provide clearance directly to Kelly, cc'ing EAP/J.

Many thanks

SBU  
This email is UNCLASSIFIED.

---

**From:** McKellogg, Kelly E  
**Sent:** Monday, March 14, 2011 4:46 PM  
**To:** EAP-J-Office-DL  
**Cc:** EAP-P-Office-DL  
**Subject:** VOA Editorial - pls clear by 11am TUESDAY

J colleagues,  
Clearance requested on the attached editorial. USAID has added some edits. Please send me your edits by 11am tomorrow (TUESDAY).  
Thanks,

**Kelly McKellogg**  
Bureau of East Asian and Pacific Affairs  
Office of Public Affairs (EAP/P)  
202-647-1028

SBU  
This email is UNCLASSIFIED.

DATE=00/00/2011

TYPE=EDITORIAL

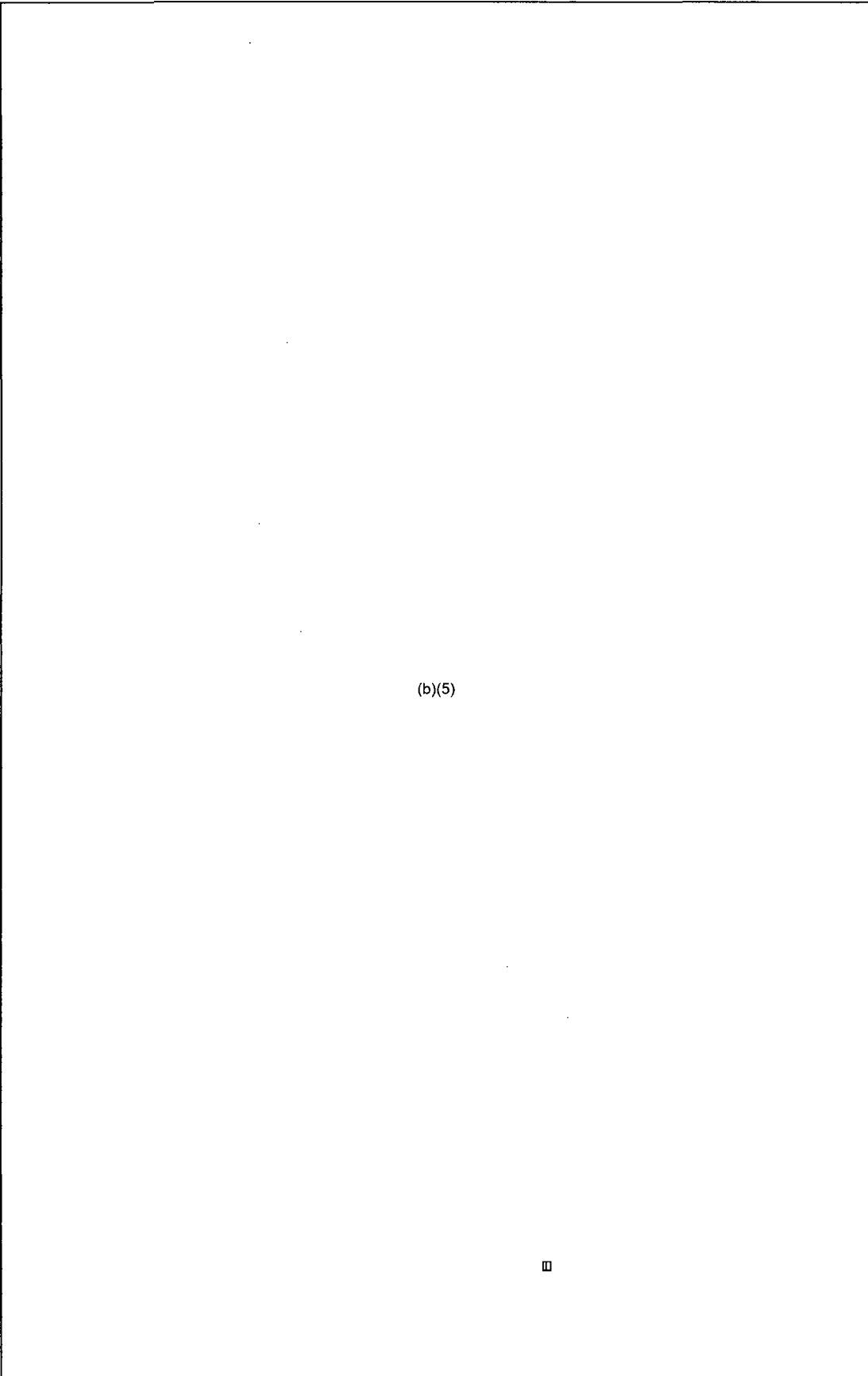
NUMBER=0-

TITLE=EDITORIAL: U.S. AIDS JAPAN

INTERNET=Yes

CONTENT=THIS EDITORIAL IS BEING RELEASED FOR USE  
BY ALL SERVICES.

(b)(5)



(b)(5)

□

(b)(5)



---

**From:** LIA02 Hoc  
**Sent:** Tuesday, March 15, 2011 4:28 PM  
**To:** Foggie, Kirk; Smith, Brooke; Trapp, James; Ulses, Anthony; Casto, Chuck; Monninger, John; Nakanishi, Tony; Kolb, Timothy; Foster, Jack; Cook, William; Devercelly, Richard; RST01 Hoc; RST01B Hoc  
**Subject:** FW: Japan Emergency Command Center Sitrep #7  
**Attachments:** image001.gif

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Tuesday, March 15, 2011 4:25 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc; LIA08 Hoc; Harrington, Holly; McIntyre, David; Burnell, Scott; Taylor, Robert; Marshall, Jane; Gott, William; Grant, Jeffery  
**Subject:** FYI: Japan Emergency Command Center Sitrep #7  
  
**Subject:** Japan Emergency Command Center Sitrep #7

**UNCLASSIFIED**



(b)(5)

(b)(5)

(b)(5)

(b)(5)

**Drafted By:**

TOKYO:Whitney, Thomas C

**Approved By:**

TOKYO/EMB/POL:Pommersheim, John M

**Released By:** TOKYO:Whitney, Thomas C  
**Info:**  
**Attachments:** 11-14R Amb Roos Message March 16.docx, Metadata.dat

---

**Action Post:**  
**Dissemination Rule:** IMO, POL, DAO\_INFO, CONS\_ACTION, MGT\_ACTION, CONGEN, CLO, EXEC, LEGAT, POL\_INFO, EAC, ORA, RSO

**UNCLASSIFIED**

---

**From:** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 3:50 PM  
**To:** LIA01 Hoc  
**Subject:** FW: Information for OST  
**Attachments:** RST Daishia Analysis 0315 @0840.docx  
  
**Categories:** FOIA

---

**From:** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 9:32 AM  
**To:** (b)(6)  
**Subject:** Information for OST

John,

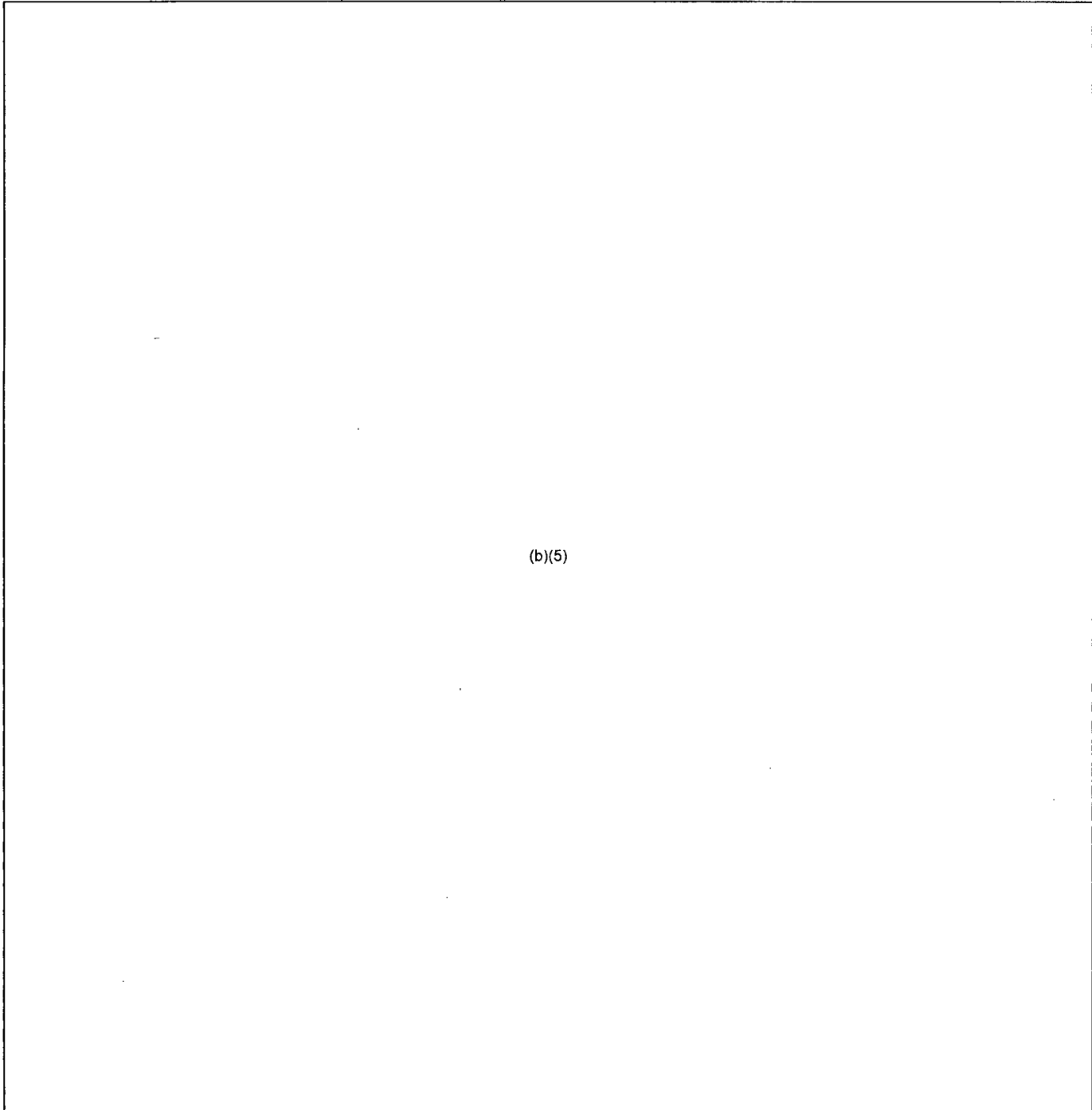
The NRC received a request to send the attached document to the Office of Science and Technology. I was given your name as a person who could help get this in the right hands. Let me know if you have any questions.

Beth Reed  
Federal Liaison Desk  
301-816-5208

14:51 EDT  
3/14/2011

**DRAFT**

**Severe Accident Consequences**



(b)(5)

(b)(5)



---

**From:** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 3:38 PM  
**To:** RMTFACTSU\_ELNRC  
**Cc:** LIA01 Hoc  
**Subject:** Chorn Update 1530  
**Attachments:** ET Chron 0315 @1533.pdf; LT Chron 0315 @1536.pdf

**Categories:** FOIA

---

**From:** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 3:17 PM  
**To:** Liang, Rachel  
**Cc:** Nuclear SSA; LIA01 Hoc  
**Subject:** RE: Request for Information  
**Attachments:** Response to Nuke SS 0315 @1513.docx

**Categories:** FOIA

Nuclear SSA below are the responses to your questions about health effects. Also the complete document with answers to both set of questions is attached.

What human health affects should we see in the major cities such as Tokyo if the wind turns from the east? The NRC does not anticipate radiation levels that would lead to human health effects in Tokyo. Tokyo is many miles outside the zone that was requested to evacuate and therefore the Japanese government has determined that citizens are safe to remain in the area without the potential of adverse health effects.

What impact to farm animals or plant life (as in absorbing unhealthy levels of radioactive isotopes for human consumption) should we expect in Japan and how far west (Korea and China) should we see affects on humans, farm animals, and plant life (again where the plants are storing radioactive isotopes harmful for human consumption)? Based on the information we have we do not expect any unhealthy levels of radiation to reach China or Korea.

Beth Reed  
Federal Liaison Desk  
301-816-5208

---

**From:** Liang, Rachel [mailto:Rachel.Liang@dhs.gov]  
**Sent:** Tuesday, March 15, 2011 12:58 PM  
**To:** LIA11 Hoc  
**Cc:** Nuclear SSA  
**Subject:** Request for Information

NRC Federal Liaison Desk,

The Nuclear SSA is seeking your assistance with a couple inquiries from internal DHS staff regarding the ongoing incident in Japan. We understand that any information provided may be preliminary, at will be restricted for internal DHS use only.

Below are the items for which we are requesting the NRC's assistance:

1. What is the difference in utilizing salt water in lieu of normal reactor coolant? Does the use of salt water indicate that the facility will never again return to normal operation? Additionally, what is done with the contaminated sea water once the reactor is stabilized? Lastly, are there any additional known advantages and disadvantages in the use of salt water in this kind of situation?
2. Under a potential worst-case scenario of one or more of the reactors melting down:
  - a. What human health affects should we see in the major cities such as Tokyo if the wind turn from the east?

- b. What impact to farm animals or plant life (as in absorbing unhealthy levels of radioactive isotopes for human consumption) should we expect in Japan and how far west (Korea and China) should we see affects on humans, farm animals, and plant life (again where the plants are storing radioactive isotopes harmful for human consumption)?
- c. what impact to farm animals or plant life (as in absorbing unhealthy levels of radioactive isotopes for human consumption) should we expect in Japan and how far west (Korea and China) should we see affects on humans, farm animals, and plant life (again where the plants are storing radioactive isotopes harmful for human consumption)

We appreciate your assistance with this inquiry. Please contact me with any questions or concerns.

Thanks,

Rachel (Treffeisen) Liang  
Nuclear Sector-Specific Agency  
Office of Infrastructure Protection  
Department of Homeland Security  
(703) 603-5136 (office)  
(b)(6) (mobile)  
[rachel.liang@dhs.gov](mailto:rachel.liang@dhs.gov) **NEW!**

Below are the items for which we are requesting the NRC's assistance:

1. What is the difference in utilizing salt water in lieu of normal reactor coolant? Normal reactor coolant is deionized and inhibits corrosion. Salt water will corrode the steel liners and components in the reactor. Saltwater is readily available from the ocean with unlimited supply.

Does the use of salt water indicate that the facility will never again return to normal operation? The use of sea water indicates that the power copy that owns the facilities doesn't plan to use the facility; however they can choose to clean the facility in the future.

Additionally, what is done with the contaminated sea water once the reactor is stabilized? Any saltwater that is contaminated above regulatory limits will be removed, processed, and the residual contaminated waste will be shipped off site as radioactive waste.

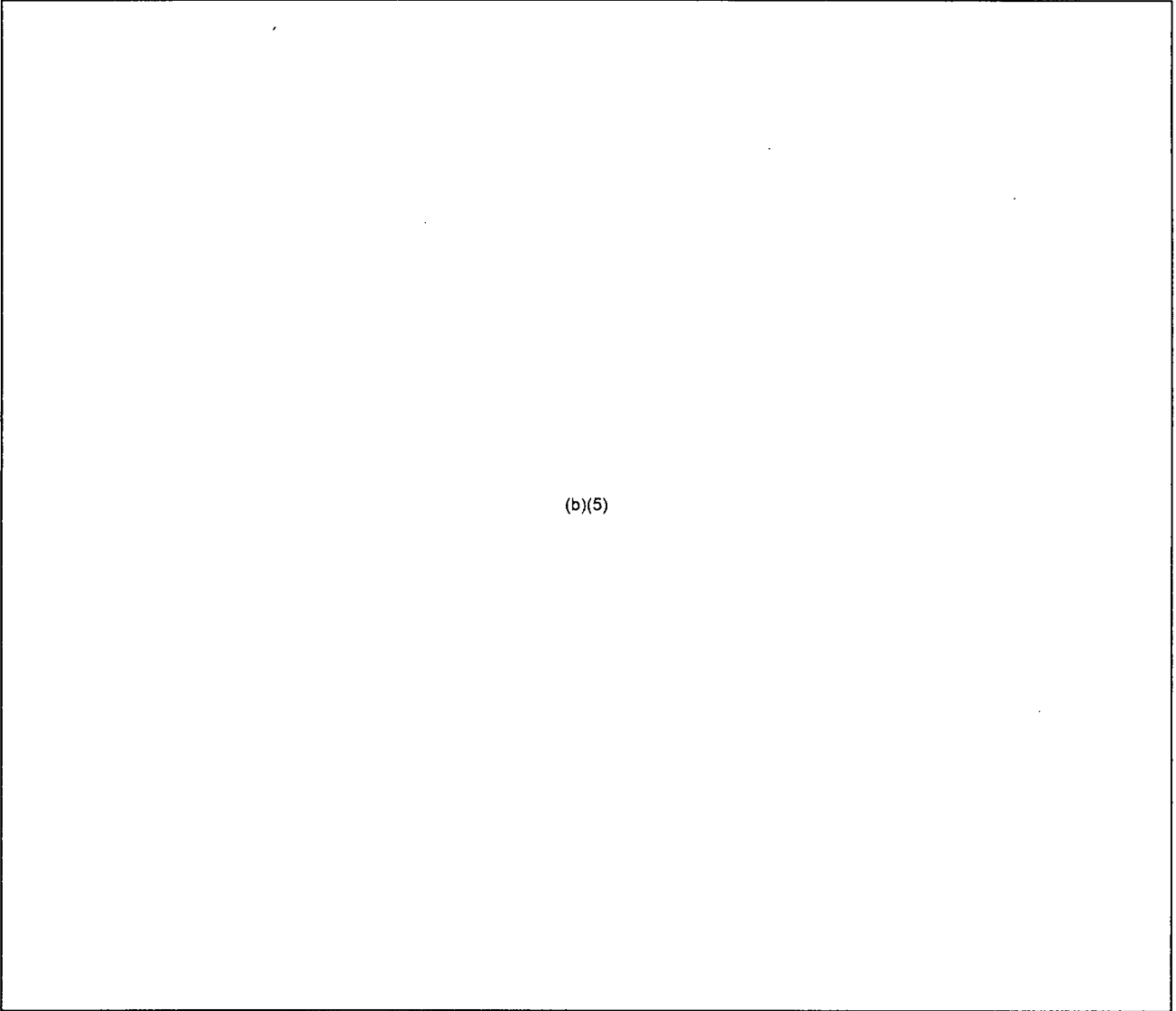
Lastly, are there any additional known advantages and disadvantages in the use of salt water in this kind of situation? None.

2. Under a potential worst-case scenario of one or more of the reactors melting down:
  - a. What human health effects should we see in the major cities such as Tokyo if the wind turns from the east? At this time the NRC does not have enough information to predict the potential health effects. Tokyo is many miles outside the zone that was requested to evacuate and therefore the Japanese government has determined citizens are safe to remain in the area without the potential of adverse health effects.

b. What impact to farm animals or plant life (as in absorbing unhealthy levels of radioactive isotopes for human consumption) should we expect in Japan and how far west (Korea and China) should we see affects on humans, farm animals, and plant life (again where the plants are storing radioactive isotopes harmful for human consumption)? The NRC does not have enough information on radiation measurements from the affected areas to make an educated determination. Based on the information we have to date we do not expect any unhealthy levels of radiation to reach China or Korea.

The Nuclear SSA is seeking your assistance with a couple inquiries from internal DHS staff regarding the ongoing incident in Japan. We understand that any information provided may be preliminary, at will be restricted for internal DHS use only.

Below are the items for which we are requesting the NRC's assistance:



---

**From:** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 3:00 PM  
**To:** Hoc, PMT12  
**Subject:** RE: Respne to Nuke SSA 0315

**Categories:** FOIA

Got it, thanks!

---

**From:** Hoc, PMT12  
**Sent:** Tuesday, March 15, 2011 3:00 PM  
**To:** LIA11 Hoc  
**Subject:** Respne to Nuke SSA 0315

---

**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Tuesday, March 15, 2011 2:41 PM  
**To:** LIA08 Hoc; LIA11 Hoc; LIA07 Hoc; LIA02 Hoc; LIA01 Hoc  
**Subject:** Outstanding Issues??

**Categories:** FOIA

Federal Liaison, LT:

Do we have any outstanding issues? Jason is working on the dosimeter problem and I just got done with the congressional call.

Actions?

Michael I. Dudek



---

**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Wednesday, March 16, 2011 12:26 PM  
**To:** Marshall, Jane  
**Subject:** FW: GE Generator Set Locations

Main e-mail

---

**From:** RMTPACTSU\_DMO  
**Sent:** Wednesday, March 16, 2011 7:00 AM  
**To:** Cohen, Harold(GC/DCHA) [USAID]; RMTPACTSU\_LC; RMTPACTSU\_ELNRC; RMTPACTSU\_DOE  
**Cc:** RMTPACTSU\_RM  
**Subject:** RE: GE Generator Set Locations

I need tech colleagues and Logs to chime in on this.

---

**From:** Cohen, Harold(GC/DCHA) [mailto:hcohen@usaid.gov]  
**Sent:** Wednesday, March 16, 2011 6:25 AM  
**To:** RMTPACTSU\_DMO; RMTPACTSU\_LC; RMTPACTSU\_ELNRC; RMTPACTSU\_DOE  
**Cc:** RMTPACTSU\_RM  
**Subject:** Re: GE Generator Set Locations

This is first I've seen of this. Will need to understand more. Can someone provide overview of what we have in mind?  
Thx.

-----  
Sent from BlackBerry

---

**From:** RMTPACTSU\_DMO  
**To:** OFDAGOV: RMTPACTSU\_LC; Cohen, Harold(GC/DCHA); RMTPACTSU\_ELNRC ; RMTPACTSU\_DOE  
**Cc:** OFDAGOV: RMTPACTSU\_RM  
**Sent:** Wed Mar 16 00:24:12 2011  
**Subject:** Re: GE Generator Set Locations

Hi Hal,

I'm jumping into this late. If this is validated by our doe and nrc colleagues and it could be potentially life saving, can we move this for GE and figure out the reimbursement later?

Apologies if you have already chimed in on this. It seems time sensitive.

---

**From:** RMTPACTSU\_LC  
**To:** RMTPACTSU\_DMO  
**Sent:** Tue Mar 15 18:33:53 2011  
**Subject:** Re: GE Generator Set Locations

Okay, it will cost millions to ship via air and it will be very challenging since the infrastructure is in shambles but that what makes it fun. I can't wait.

---

**From:** RMTPACTSU\_LC  
**To:** RMTPACTSU\_DMO; RMTPACTSU\_LC  
**Sent:** Tue Mar 15 18:28:34 2011  
**Subject:** RE: GE Generator Set Locations

Sounds like there will be much discussion on this tonight with the DART and their contacts. Some points that I have gathered from NRC and others

- GE is the designer of the affected reactors
- It is in GE's interest to provide power to assist with the containment of the reactors
- GE is planning to pay for the lift – just needs USAID's assistance to make it happen
- GE does not have the logistical capacity to QUICKLY get the generators to Japan
- The GOJ says anything to assist with the reactor situation is priority

We'll see what they come up with in the field.

Let me know if there's anything else we need to do on this tonight.

---

**From:** RMTPACTSU\_LC  
**Sent:** Tuesday, March 15, 2011 5:56 PM  
**To:** RMTPACTSU\_DMO; RMTPACTSU\_LC  
**Subject:** RE: GE Generator Set Locations

Sounds like they are planning on it.

---

**From:** RMTPACTSU\_LC  
**Sent:** Tuesday, March 15, 2011 5:54 PM  
**To:** RMTPACTSU\_DMO  
**Cc:** RMTPACTSU\_LC  
**Subject:** Fw: GE Generator Set Locations

?? Maybe they want to pay for the transport?

---

**From:** Douglas, Richard (GE Aviation, US) <richard.douglas1@ge.com>  
**To:** RMTPACTSU\_LC; RMTPACTSU\_ELNRC  
**Sent:** Tue Mar 15 17:50:20 2011  
**Subject:** RE: GE Generator Set Locations

In addition to the great logistics pre-work your team is doing, we will also need to get our contracts groups together to discuss how GE reimburses the government for the lift. Could you direct me to someone to get that discussion going?

---

**From:** RMTPACTSU\_LC [mailto:RMTPACTSU\_LC@ofda.gov]  
**Sent:** Tuesday, March 15, 2011 4:48 PM  
**To:** Douglas, Richard (GE Aviation, US); RMTPACTSU\_ELNRC  
**Cc:** Boutte, Brian (GE Energy); Oates, Kennedy (GE Energy); Nemecek, John (GE Energy); Richards, Tim J (GE, Corporate); Pickart, George (GE Power & Water); Patton, Gregory J (GE Power & Water); Anderson, Robert F (GE Power & Water)  
**Subject:** RE: GE Generator Set Locations

Thank you Rich,

When we spoke on the phone, I didn't see the following sentence in your email.

*Seven units will be the new TM+ version and three units will be the original base model.*

I got it now. Just for clarification, are the three units in Pensacola the original base units?

Also, I want to stress that we don't have approval to move on this, but I'm just gathering information in case it does become a requirement.

Thanks again,  
Todd

Logistics Coordinator  
202-712-0039 x-5706  
[Rmtpactsu\\_lc@ofda.gov](mailto:Rmtpactsu_lc@ofda.gov)  
[ofdalogistics@usaid.gov](mailto:ofdalogistics@usaid.gov)

---

**From:** Douglas, Richard (GE Aviation, US) [mailto:richard.douglas1@ge.com]  
**Sent:** Tuesday, March 15, 2011 4:14 PM  
**To:** RMTPACTSU\_LC; RMTPACTSU\_ELNRC  
**Cc:** Boutte, Brian (GE Energy); Oates, Kennedy (GE Energy); Nemecek, John (GE Energy); Richards, Tim J (GE, Corporate); Pickart, George (GE Power & Water); Patton, Gregory J (GE Power & Water); Anderson, Robert F (GE Power & Water)  
**Subject:** GE Generator Set Locations

Jason/Todd,

(b)(4)

---

**From:** RMTPACTSU\_LC [mailto:RMTPACTSU\_LC@ofda.gov]  
**Sent:** Tuesday, March 15, 2011 2:20 PM  
**To:** RMTPACTSU\_ELNRC  
**Cc:** Douglas, Richard (GE Aviation, US)  
**Subject:** FW: Contact Data -- Please confirm receipt Thanks.

Thanks Jason,

Richard,

(b)(4)

Todd

Logistics Coordinator  
202-712-0039 x-5706  
[Rmtpactsu\\_lc@ofda.gov](mailto:Rmtpactsu_lc@ofda.gov)  
[ofdalogistics@usaid.gov](mailto:ofdalogistics@usaid.gov)

---

**From:** RMTPACTSU\_ELNRC  
**Sent:** Tuesday, March 15, 2011 1:59 PM  
**To:** RMTPACTSU\_LC  
**Subject:** FW: Contact Data -- Please confirm receipt Thanks.

---

**From:** Douglas, Richard (GE Aviation, US) [mailto:richard.douglas1@ge.com]  
**Sent:** Tuesday, March 15, 2011 1:37 PM  
**To:** RMTPACTSU\_ELNRC  
**Cc:** Skavdal, Stan (GE Aviation, US)  
**Subject:** RE: Contact Data -- Please confirm receipt Thanks.

Jason,

Several attachments following up on our phone call.

First is the letter we received from TEPCO asking for help. The official who sent the letter is Mr. Toyohiko Ishimaru, GM, Thermal Power Plant Engineering Center, Thermal Power Department, TEPCO. EM: [ishimaru.toyohiko@tepcoco.jp](mailto:ishimaru.toyohiko@tepcoco.jp); Tel: +80-3-6373-4101; Cell: (b)(6) LTC Martinez asked for this information so that USAID in Tokyo could verify the request. I left LTC Martinez a VM, but if you have her e-mail, I would appreciate an assist in closing this loop.

Attached are the specs for the generator sets. I am sure you will have questions, so when you are ready, I will schedule a call with the people who are more technically familiar with the gensets.

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Tuesday, March 15, 2011 11:43 AM  
**To:** Douglas, Richard (GE Aviation, US)  
**Subject:** RE: Contact Data -- Please confirm receipt Thanks.

Received all e-mails are good.

---

**From:** Douglas, Richard (GE Aviation, US) [mailto:richard.douglas1@ge.com]  
**Sent:** Tuesday, March 15, 2011 11:43 AM  
**To:** RMTPACTSU\_ELNRC; jason.kozal@nrc.gov  
**Subject:** Contact Data -- Please confirm receipt Thanks.

**Rich Douglas**

Vice President  
International Programs  
T 202-637-4212  
F 202-637-4412  
C (b)(6)  
E [Richard.Douglas1@ge.com](mailto:Richard.Douglas1@ge.com)

1299 Pennsylvania Avenue, NW  
Suite 900  
Washington, DC 20004-2407  
GE Aviation

---

**Subject:** 2011 Pacific Basin Earthquake/Tsunami ESF-8 Conference Call  
**Location:** 877-700-1237; PC: (b)(6)  
**Start:** Wed 3/16/2011 11:00 AM  
**End:** Wed 3/16/2011 12:00 PM  
**Recurrence:** (none)  
**Meeting Status:** Accepted  
**Organizer:** OS Secretarys Operations Center  
**Categories:** FOIA

**AGENDA:**

**2011 Pacific Basin Earthquake/Tsunami ESF-8 Conference Call**

**Phone: 877-700-1237**

**Passcode:** (b)(6)

**Objective: Discussion of current response operations and future actions.**

HHS – Opening Comment  
- Quick summary on any HHS issues/concerns

Regional Updates:

IRTC

- Region IX
- Region X

EMG Updates:

EMG OPS/FIELD OPS/OFRD OPS

EMG Logs

EMG Plans

EMG A/F

Public Affairs

Other OPDIVs/STAFF DIVs:

FDA update

CDC Update

Supporting Agencies:

DOS update

NRC update

USDA update

EPA update

Other supporting Agencies update

Questions:

Adjournment & Closing Comments:

Time for the next conference call: TBD

---

**From:** LIA01 Hoc  
**Sent:** Tuesday, March 15, 2011 1:57 PM  
**To:** LIA11 Hoc  
**Subject:** FW: Possible Radiation Plume Tracking in N. Pacific/ Japan  
  
**Categories:** FOIA

-----Original Message-----

From: Hogan, Alfred [mailto:Alfred.Hogan@ic.fbi.gov]  
Sent: Tuesday, March 15, 2011 1:44 PM  
To: LIA01 Hoc; LIA11 Hoc; (b)(6)  
Cc: Karl, Larry D.; Matherson, Carla S.  
Subject: FW: Possible Radiation Plume Tracking in N. Pacific/ Japan

Ted

As discussed. This is the RFI message received regarding Plume Tracking. I will provide CDR DOLL the NRC EOC # as to facilitate connect.

///BREAK///

CDR DOLL the NRC Emergency Operations Center number is 301-816-5100. I spoke with Mr. Ted SMITH who may be able to assist you in your endeavors regarding this issue.

Al Hogan  
Special Agent  
Office of the Inspector General  
Nuclear Regulatory Commission  
National Joint Terrorism Task Force  
571-280-0621 O  
301-415-5566 O

-----Original Message-----

From: Matherson, Carla S.  
Sent: Tuesday, March 15, 2011 12:47 PM  
To: Hogan, Alfred  
Subject: FW: Possible Radiation Plume Tracking in N. Pacific/ Japan

Transportation Team,

(b)(5)

Sincerely,



Carla S. Matherson  
Intelligence Analyst  
Counterterrorism Division  
National Joint Terrorism Task Force (NJTTF) Maritime Security Program (MSP)  
571-280-5419 (desk)  
(b)(6) (cell)

-----Original Message-----

From: (b)(6)

Sent: Tuesday, March 15, 2011 1:38 AM

To: (b)(6)

(b)(6)

Cc: Walsh, Kevin ITCS (USN); Harvey, Chad LT; Gerecke, Paul CDR; Seffel, Gary  
Subject: Possible Radiation Plume Tracking in N. Pacific/ Japan

MDA Participants;

(b)(5)

I will be out of the office for part of the day tomorrow, therefore please pass any leads to the addresses on the Cc line.

V/r

CDR Erich Doll USCG  
NMCO National MDA Coordination Office  
Rm.4104  
U.S. Coast Guard Headquarters  
2100 Second Street SW

Washington DC. 20593-7683

Off: 202.372.3066

Cell: (b)(6)

---

**From:** RMPACTSU\_ELNRC <RMPACTSU\_ELNRC@ofda.gov>  
**Sent:** Tuesday, March 15, 2011 1:55 PM  
**To:** LIA11 Hoc  
**Cc:** Powell, Amy; LIA11 Hoc; LIA01 Hoc; LIA02 Hoc; LIA07 Hoc; Schmidt, Rebecca; Dacus, Eugene; LIA08 Hoc  
**Subject:** RE: Tuesday's 2:00 PM Conference Call with Congress Staffers  
**Categories:** FOIA

All..  
be advised that Michael might be a couple min late.. he is completing the badging process here and I am covering the dosimeter conference call with the White House.

Best,

Jason Kozal

---

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Tuesday, March 15, 2011 12:56 PM  
**To:** RMPACTSU\_ELNRC  
**Cc:** (b)(6)  
**Subject:** FW: Tuesday's 2:00 PM Conference Call with Congress Staffers

FYI

---

**From:** Powell, Amy  
**Sent:** Tuesday, March 15, 2011 12:55 PM  
**To:** Droggitis, Spiros; LIA01 Hoc  
**Cc:** LIA03 Hoc; LIA11 Hoc; LIA07 Hoc; LIA08 Hoc; Schmidt, Rebecca; Dacus, Eugene  
**Subject:** RE: Tuesday's 2:00 PM Conference Call with Congress Staffers

Only one change and it was relatively last minute: Gene Dacus in OCA will be on the call with Mike.

Michael, thanks for looping us into these calls. OCA and OEDO have coordinated and will be supporting this call each day this week at 2pm. Either Mike or Marty will be on with OCA, depending on scheduling for each.

Thanks,  
Amy

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

---

**From:** Droggitis, Spiros  
**Sent:** Tuesday, March 15, 2011 12:53 PM  
**To:** LIA01 Hoc  
**Cc:** LIA03 Hoc; LIA11 Hoc; LIA07 Hoc; LIA08 Hoc; Schmidt, Rebecca; Powell, Amy  
**Subject:** RE: Tuesday's 2:00 PM Conference Call with Congress Staffers

Michael: My understanding is that Bill Borchardt, EDO, and my boss, Becky Schmidt, Director OCA, are briefing the Congressional leaders from both sides at 1:00 today and that Mike Weber, DEDO, and Amy Powell, OCA, are participating in the 2:00 USAID call. I have cc'd Becky and Amy in case my understanding is faulty. Hope this helps, Spiros Droggitis, OCA

---

**From:** LIA01 Hoc  
**Sent:** Tuesday, March 15, 2011 12:45 PM  
**To:** Droggitis, Spiros  
**Cc:** LIA03 Hoc; LIA11 Hoc; LIA07 Hoc; LIA08 Hoc  
**Subject:** FW: Tuesday's 2:00 PM Conference Call with Congress Staffers

fyi

---

**From:** RMTFACTSU\_ELNRC [mailto:RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Tuesday, March 15, 2011 12:41 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA08 Hoc; Burnell, Scott; Harrington, Holly; McIntyre, David; Marshall, Jane  
**Subject:** Tuesday's 2:00 PM Conference Call with Congress Staffers

OCA & OPA,

Is Mr. Virgilio planning on supporting the 2:00 PM conference call with the Congressional staffers again?

I have also heard that there is a 1:00 PM Senate Briefing. Do we know any information about this? I can dig into the where and when of this if needed.

The phone number for the 2:00 PM call is: 202-647-0817, Code (b)(6)

Thanks!  
Michael I. Dudek

---

**From:** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 1:43 PM  
**To:** Kozal, Jason  
**Subject:** RE: GOJ urgent request for water pumping capacity (UNCLASSIFIED)

**Categories:** FOIA

Thanks!

-----Original Message-----

From: Kozal, Jason  
Sent: Tuesday, March 15, 2011 1:42 PM  
To: LIA11 Hoc  
Subject: Re: GOJ urgent request for water pumping capacity (UNCLASSIFIED)

Will do. I have a couple of conference calls and I am on it.

Sent from an NRC BlackBerry  
Jason W Kozal

(b)(6)

----- Original Message -----

From: LIA11 Hoc  
To: RMTFACTSU\_ELNRC <RMTFACTSU\_ELNRC@ofda.gov>  
Cc: (b)(6); Kozal, Jason  
Sent: Tue Mar 15 11:29:07 2011  
Subject: FW: GOJ urgent request for water pumping capacity (UNCLASSIFIED)

Jason this is the request I was talking about, please see attachment. The original came through the State Department for Japan. Is this something you guys can follow up on or is there someone else I can call?

Beth

-----Original Message-----

From: Bivona, John C MVN [mailto:(b)(6)]  
Sent: Tuesday, March 15, 2011 11:22 AM  
To: LIA11 Hoc  
Subject: FW: GOJ urgent request for water pumping capacity (UNCLASSIFIED)

Classification: UNCLASSIFIED

Caveats: FOUO-

Fyi

John C. Bivona, P.E.  
Assistant Chief, Engr Division  
New Orleans District

504-862-2730

-----Original Message-----

From: Sanchez, Mike MVN

Sent: Tuesday, March 15, 2011 9:56 AM

To: [REDACTED] (b)(6)

Cc: Baummy, Walter O MVN; Bivona, John C MVN; Maltzahn, Rachael A MVN

Subject: FW: GOJ urgent request for water pumping capacity (UNCLASSIFIED)

Classification: UNCLASSIFIED

Caveats: FOUO

Mr. Duong,

Please confirm the pump requirement of 250 gpm at 75 - 100 psi. Are you sure that the capacity is only 250 gpm?

Thanks,

Mike Sanchez, P.E.

(504) 862 2698

-----Original Message-----

From: Maltzahn, Rachael A MVN

Sent: Tuesday, March 15, 2011 8:15 AM

To: Baummy, Walter O MVN; Bivona, John C MVN; Bonura, Darryl C MVN; Sanchez, Mike MVN

Cc: Gonski, Mark H MVN

Subject: RE: GOJ urgent request for water pumping capacity (UNCLASSIFIED)

Classification: UNCLASSIFIED

Caveats: NONE

Last attachment had email text cut off...corrected on attached.

Thanks,

Rachael

-----Original Message-----

From: Maltzahn, Rachael A MVN

Sent: Tuesday, March 15, 2011 8:07 AM

To: Baummy, Walter O MVN; Bivona, John C MVN; Bonura, Darryl C MVN; Sanchez, Mike MVN

Cc: Gonski, Mark H MVN

Subject: RE: GOJ urgent request for water pumping capacity (UNCLASSIFIED)

Classification: UNCLASSIFIED

Caveats: NONE

The attachment was an email. We are looking into request now.

Thanks,

Rachael

-----Original Message-----

From: Baummy, Walter O MVN

Sent: Tuesday, March 15, 2011 8:00 AM

To: Bivona, John C MVN; Bonura, Darryl C MVN; Maltzahn, Rachael A MVN; Sanchez, Mike MVN

Cc: Baummy, Walter O MVN; Gonski, Mark H MVN

Subject: FW: GOJ urgent request for water pumping capacity (UNCLASSIFIED)

Classification: UNCLASSIFIED

Caveats: NONE

Daryl, please see if you can get an early morning response.

Below is part of a message I received last night in regard to the Japan situation. Specifically looking for a pump that meets the requirements below. Advise if you can identify a pump meeting below - seems like a 3 inch pump or so to me but I could not open what's believed to be a pump curve in the attachment. Engagement with us is connected to Katrina response experience.

The urgent request by the Prime Minister for water pumping capability to assist TEPCO at its Fukushima nuclear plant is being worked by USFJ (see attached email). Their initial response has been to send two fire trucks - one from Yokota and one from Yokosuka - by road. One has arrived and the other is 1530 HST (3 hours from now). TEPCO already had five on site.

For the longer term, they are seeking high capacity pumps from the service components in Japan with following specs:

"COOLING: 250 GPM @ 75-100 PSI. This is the estimated cooling stream and pressure required to remove the latent heat and overcome the 50 PSI or so gas venting from the containment vessel to reach the bottom. The fitting for the discharge is assumed to be a standard fire hose outlet. The issue is that to properly size the pump we need to know the pump lift, suction head and distance to pump -friction loss. Water source - ocean, cistern or hydrant?"

More details in attachment.

Classification: UNCLASSIFIED  
Caveats: NONE

Classification: UNCLASSIFIED  
Caveats: NONE

Classification: UNCLASSIFIED  
Caveats: NONE

Attachment Classification: UNCLASSIFIED  
Attachment Caveats: NONE

Classification: UNCLASSIFIED  
Caveats: ~~FOUO~~

Attachment Classification: UNCLASSIFIED  
Attachment Caveats: NONE

Classification: UNCLASSIFIED  
Caveats: ~~FOUO~~



Received: from [REDACTED] (b)(6) ([10.32.0.42]) by  
[REDACTED] (b)(6) with Microsoft SMTPSVC(6.0.3790.4675);  
Mon, 14 Mar 2011 11:49:52 -1000  
Received: from [REDACTED] (b)(6) ([10.32.118.48]) by  
[REDACTED] (b)(6) with Microsoft SMTPSVC(6.0.3790.4675);  
Mon, 14 Mar 2011 11:49:52 -1000  
Received: from YOKEX01.usfj.nipr ([172.25.25.10])  
by [REDACTED] (b)(6) with ESMTMP id p2ELna6V084157  
for [REDACTED] (b)(6); Tue, 15 Mar 2011 06:49:36 +0900 (JST)  
Received: from [REDACTED] (b)(6) (Unknown\_Domain [215.1.46.2])  
by (By accessing this system, you are consenting to this monitoring.)  
with SMTP id 94.A2.20482.08D8E7D4; Mon, 14 Mar 2011 21:49:52 +0000 (GMT)  
Received: from [REDACTED] (b)(6) ([10.32.72.185]) by  
[REDACTED] (b)(6) with Microsoft SMTPSVC(6.0.3790.4675);  
Mon, 14 Mar 2011 11:49:52 -1000  
Received: from [REDACTED] (b)(6) ([10.32.72.180]) by  
[REDACTED] (b)(6) with Microsoft SMTPSVC(6.0.3790.4675);  
Mon, 14 Mar 2011 11:49:53 -1000  
From: "USFJ-CAT-J4" <[REDACTED] (b)(6)>  
Sender: "Duong, Tamanh Q LCDR USN USFJ J4" <[REDACTED] (b)(6)>  
To: "Schnabel, Mark M CIV J448," <[REDACTED] (b)(6)>  
Subject: FW: GOJ urgent request for water pumping capacity - NEED TEPCO  
ENGINEER COORD.  
Date: Mon, 14 Mar 2011 11:49:36 -1000  
Message-ID: <488D697D5180E04385A555BAC170589302C10E24@YOKEX01.usfj.nipr>  
MIME-Version: 1.0  
Content-Type: text/plain;  
charset="utf-8"  
Content-Transfer-Encoding: 8bit  
X-Mailer: Microsoft Office Outlook 12.0  
Thread-Index:  
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Content-Language: en-us  
content-class: urn:content-classes:message

FYI

-----Original Message-----

From: Duong, Tamanh Q LCDR USN USFJ J4 On Behalf Of USFJ-CAT-J4  
Sent: Tuesday, March 15, 2011 5:45 AM  
To: USFJ-CAT-MARITIME; USFJ-CAT-GROUND; USFJ-CAT-AIR; CNFJ SDO; USFJ-RCEM-  
J42; USFJ-JLOC-J43  
Cc: 'Napier, Bradford'; USFJ-CAT-J4; McDaniel, Everett K COL USA USFJ J4;  
'Tokyo PolMil Unit'; USFJ-CAT-J5  
Subject: RE: GOJ urgent request for water pumping capacity - NEED TEPCO  
ENGINEER COORD.

ALCON,

Spoke with TEPCO Engineer this morning - Mr. Yahagi - and asked if he would  
compile a list of equipment and or materials (ump, electrical, generator,  
batteries, nitrogen gas, etc...) they would need to expedite the reactor  
cooling process at Fukushima.

\*\*\* While we are waiting for a response from Mr. Yahagi, can you ask your  
respective components to see if they have the following: diesel pump,

CZ 416 of 2042

portable generators, batteries, and battery chargers, nitrogen tanks, and other piping, fitting, and hoses, as requested. See below for more details.

Thanks!

V/R

Tamanh

---

Tamanh Q. Duong, P.E., MBA  
LCDR, U.S. Navy Civil Engineer Corps  
USFJ Joint Engineer Staff Officer  
DSN: (315) 225-4712, FAX: x6743  
Commercial (CONUS) 011-81-3117-55-4712  
Commercial (JAPAN) 03117-55-4712  
NIPR: (b)(6)  
SIPR: (b)(6)

-----Original Message-----

From: Tran, John D Maj USAF USFJ J5 On Behalf Of USFJ-CAT-J5  
Sent: Tuesday, March 15, 2011 2:34 AM  
To: Tokyo PolMil Unit  
Cc: Napier, Bradford; USFJ-CAT-J4  
Subject: FW: GOJ urgent request for water pumping capacity - NEED TEPCO ENGINEER COORD.

Brad,

As discussed, below is the technical dialogue our J4 would like to have with an engineer at TEPCO--if we need to have a translator, we'll get one. Can you see if someone from MEXT/TEPCO will either a) answer the questions ASAP or b) allow us to have a direct dialogue with TEPCO engineers? Thanks.

v/r  
jt

John D. Tran, Major, USAF  
J54 International Relations Officer, Government Relations Branch  
United States Forces Japan  
DSN: 315-225-4428  
Comm: 011-81-311-755-4428  
Jpn Comm: 042-552-2511 Ext: 5-4428  
Cell: (b)(6)

-----Original Message-----

From: Duong, Tamanh Q LCDR USN USFJ J4 On Behalf Of USFJ CAT-J4  
Sent: Tuesday, March 15, 2011 2:09 AM  
To: USFJ-CAT-J5; 'lia02.hoc@nrc.gov'; USFJ-RCEM-J42; USFJ-CAT-CHIEF; USFJ-CAT-GROUND; USFJ-CAT-AIR; USFJ-CAT-MARITIME; CNFJ SDO; Basalla, Suzanne SAA AMEMB JP; McDaniel, Everett K COL USA USFJ J4; Chang, Donald GS-14 DNC USFJ J4; Wiltse, Jeffrey S COL USA USFJ J5; Young, Joseph ChiefPolMil AMEMB JP  
Subject: FW: GOJ urgent request for water pumping capacity - NEED TEPCO ENGINEER COORD.

ALCON,

We just spoke with NCR - Peter Alter on the Pump, Generator / Charger, Nitrogen Requirement.

1. We need the contact information for the TEPCO Engineer or preferably the PLANT ENGINEER in order to ask him directly for the specifications of the PUMP, GENERATOR/CHARGER and QUANTITY OF NITROGEN GAS. And, as important we need to know if there are technicians and plant mechanics on hand to do the work.

2. NCR recommends we contact with the Plant Operator to determine additional information rather than send something up that is not usable.

- DIESEL PUMP SPECIFICATION: 250 GPM @ 75-100 PSI... PUMP CURVE, suction, lift head, impellor size.

- GENERATOR SPECIFICATION: 480V, 50HZ or 60HZ? MINIMUM CAPACITY?

- BATTERY CHARGER SPECIFICATION: 125V or 250V? MINIMUM AMPS?

- BATTERY SPECIFICATIONS: 125V - type and number

- NITROGEN GAS QUANTITY: Lbs or Kgs (Cylinder, Tanker?)

- ANY ADDITIONAL PIPING, FITTING, WIRING, TOOLS...

3. The requirement provided by NCR is basically the requirement to provide COOLANT into the reactor vessel and to RESTORE CONTROL:

COOLING: 250 GPM @ 75-100 PSI This is the estimated cooling stream and pressure required to remove the latent heat and overcome the 50 PSI or so gas venting from the containment vessel to reach the bottom. The fitting for the discharge is assumed to be a standard fire hose outlet. The issue is that to properly size the pump we need to know the pump lift, suction head and distance to pump -friction loss. Water source - ocean, cistern or hydrant?

CONTROLLER: ELECTRICAL GENERATORS - 480V 50HZ or 60HZ dependant on what the Plant is operating. The KW capacity is whatever we can provide - more the better. The generator will be plugged into the "electrical panel" or used to supplement whatever available power is existing at the site. ELECTRICAL CHARGER - for 125V (250V) BATTERIES, it is also possible to hook up ELECTRICAL GENERATOR to existing CHARGER. Assumption: batteries still working?

CONTROL: Pneumatic Control System - Nitrogen gas is used as the pneumatic control medium within the reactor vessel. Need to ask the operator how much #lbs, cylinders or tanker truck worth is needed?

V/R Donald Chang P.E.  
Chief, Installation Division  
DSN 312-225-4712

-----Original Message-----

From: McDaniel, Everett K COL USA USFJ J4  
Sent: Tuesday, March 15, 2011 12:58 AM

To: USFJ-CAT-J4  
Subject: GOJ urgent request for water pumping capacity - follow up 2 (U)

Classification: Unclassified

See below and initiate contacts to develop situation.

From: Basalla, Suzanne I [mailto:BasallaSI@state.gov]  
Sent: Tuesday, March 15, 2011 12:23 AM  
To: LIA02 Hoc <LIA02.Hoc@nrc.gov>; Mitchell, Derek J SES OSD POLICY  
<(b)(6)>; Schiffer, Michael DASD OSD; <(b)(6)>  
<(b)(6)>; McDaniel, Everett K COL USA USFJ J4; USFJ-CAT-CHIEF;  
Wiltse, Jeffrey S COL USA USFJ J5; Crowe, Blake BGen USMC USFJ J01; Field,  
Burton M Lt Gen USAF USFJ/J00-5 AF/CC; Duncan, Aleshia D  
<DuncanAD@state.gov>; Cherry, Ronald C <CherryRC@state.gov>; JapanEmbassy,  
TaskForce <JapanEmbassyTaskForce@state.gov>; Beed, John A <beedja@state.gov>;  
Berger, William (RDMA/OFDA) <wberger@usaid.gov>; Jaczko, Gregory  
<Gregory.Jaczko@nrc.gov>; HOO Hoc <HOO.Hoc@nrc.gov>; LIA06 Hoc  
<LIA06.Hoc@nrc.gov>  
Cc: Roos, John AMB AMEMB JAPAN; Zumwalt, James P <ZumwaltJP@state.gov>;  
Fuller, Matthew G <FullerMG@state.gov>  
Subject: RE: GOJ urgent request for water pumping capacity - follow up 1

Thank you. We look forward to the list of equipment and additional advice.

SBU

This email is UNCLASSIFIED.

From: LIA02 Hoc [mailto:LIA02.Hoc@nrc.gov]  
Sent: Tuesday, March 15, 2011 12:16 AM  
To: Basalla, Suzanne I; Mitchell, Derek J SES OSD POLICY; Schiffer, Michael  
SES OSD POLICY; <(b)(6)>  
<(b)(6)>; Crowe, William B BGen USMC USFJ J01;  
<(b)(6)>; Duncan, Aleshia D; Cherry, Ronald C; JapanEmbassy,  
TaskForce; Beed, John A; Berger, William (RDMA/OFDA); Jaczko, Gregory; HOO  
Hoc; LIA06 Hoc  
Cc: Roos, John; Zumwalt, James P; Fuller, Matthew G  
Subject: RE: GOJ urgent request for water pumping capacity - follow up 1

Hi Suzanne,

I just spoke with the Director of the Reactor Safety Team here at the NRC Incident Response Center. She is aware of the request for equipment and has generated a list of equipment that, as I understand it, will be requested of U.S. military forces for use in Japan. She also notes that the equipment

may need to be accompanied by instructions in Japanese and/or personnel knowledgeable of how to operate it. This list has been generated based on our understanding of the status of systems and the core at Units 1, 2 and 3. We believe that TEPCO personnel, who will have the most current knowledge of the condition of the core and emergency systems, will be in the best position to determine where and how the equipment can be used once it arrives. We are looking for technical staff to be available to advise, if needed, on countermeasures that can be considered using this equipment.

Hope this helps,

Rani Franovich

Liaison Team Coordinator

U.S. Nuclear Regulatory Commission

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From: Basalla, Suzanne I [mailto:BasallaSI@state.gov]

Sent: Monday, March 14, 2011 10:39 AM

To: Mitchell, Derek J SES OSD POLICY; Schiffer, Michael SES OSD POLICY;

(b)(6)

(b)(6)

; Crowe, William B BGen USMC USFJ J01;

(b)(6)

; Duncan, Aleshia D; Cherry, Ronald C; JapanEmbassy, TaskForce; Beed, John A; Berger, William (RDMA/OFDA); Jaczko, Gregory; HOO Hoc; LIA02 Hoc

Cc: Roos, John; Zumwalt, James P; Fuller, Matthew G

Subject: GOJ urgent request for water pumping capacity - follow up 1

All,

(Ron/Aleshia, please pass to Jim Trapp. USFJ â€” please pass to appropriate person at PACOM.)

As an update based on tonight's White House led interagency VTC and other discussions:

-- The WH stated that the President considers it the highest priority to respond quickly and comprehensively to any request from Japan. The Prime Minister's request for truck/s with capacity to pump water at high pressure was specifically discussed.

-- OSD also stated that USFJ has appropriate authority to transfer diesel-driven pumps (in this case, a fire truck) to Japan for use in this nuclear emergency.

-- USFJ/J4 has notified us that they have a fire truck available and they are starting to move it to the affected area. MOFA has not yet responded to their request for a police escort to expedite the transit, but the "pumper" is en route and USFJ will continue to coordinate for a lash up with an escort.

-- In post-VTC discussions, Jim Trapp (NRC liaison on the DART) advised that three diesel-driven pumps should be the target number in responding to this request. USFJ should look for at least two additional diesel-driven pumps to provide to Fukushima site ASAP.

-- NRC also advised that to help Japan provide coolant to the reactor, they need more than diesel-driven pumps. The VTC participants agreed that the U.S. military forces should immediately look for ways to provide the following to the Fukushima site:

- diesel-driven pump
- AC power
- DC power
- nitrogen/air

--For further coordination on what kinds of solutions the U.S. military can offer to the Japanese to address this urgent issue, it will be useful for USFJ/J4 (who is in touch with the TEPCO personnel) to coordinate with the U.S. Army Corps of Engineers and NRC experts.

We appreciate OSD's outreach to find an Army Corps of Engineers POC to share with the group.

The NRC Chairman, Greg Jaczko, can also offer advice. I've copied his team and him on this email. Their watch can be reached via (301) 816-5100.

The USFJ POC is the J4, Colonel Everett McDaniel. Everett can be reached at DSN 315-225-4712/4705/4713. His commercial number is: 011-81-3-1175-54712/54705/54713. His cell number is: (b)(6). If you can't reach him, the USFJ watch is: DSN: 225-4223 and they can track him down.

The Mission Japan Emergency Command Center is copied above and can be reached at 03-3224-5530, commercial 81-3-3224-5530 if any additional coordination is necessary.

Thank you all for your assistance. It's great to hear one pumper is on the way - appreciate everyone's help in trying to find additional support during this urgent window.

Suzanne

Suzanne I. Basalla

Senior Advisor to Ambassador John V. Roos

American Embassy - Tokyo

cid:image001.png@01CB6AB3.DDE8C1A0 <<http://twitter.com/AmbassadorRoos>> Please follow Ambassador Roos on [Twitter.com/AmbassadorRoos](https://twitter.com/AmbassadorRoos)

Tel: 081-3-3224-5023

Fax: 081-3-3224-5312

BasallaSI@state.gov

SBU

This email is UNCLASSIFIED.

---

**From:** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 1:14 PM  
**To:** Adams, John  
**Subject:** RE: JAPNESE RTRs

**Categories:** FOIA

Thank you

-----Original Message-----

**From:** JTA@NRC.GOV [mailto:Jta@nrc.gov]  
**Sent:** Tuesday, March 15, 2011 1:05 PM  
**To:** LIA11 Hoc  
**Subject:** JAPNESE RTRs





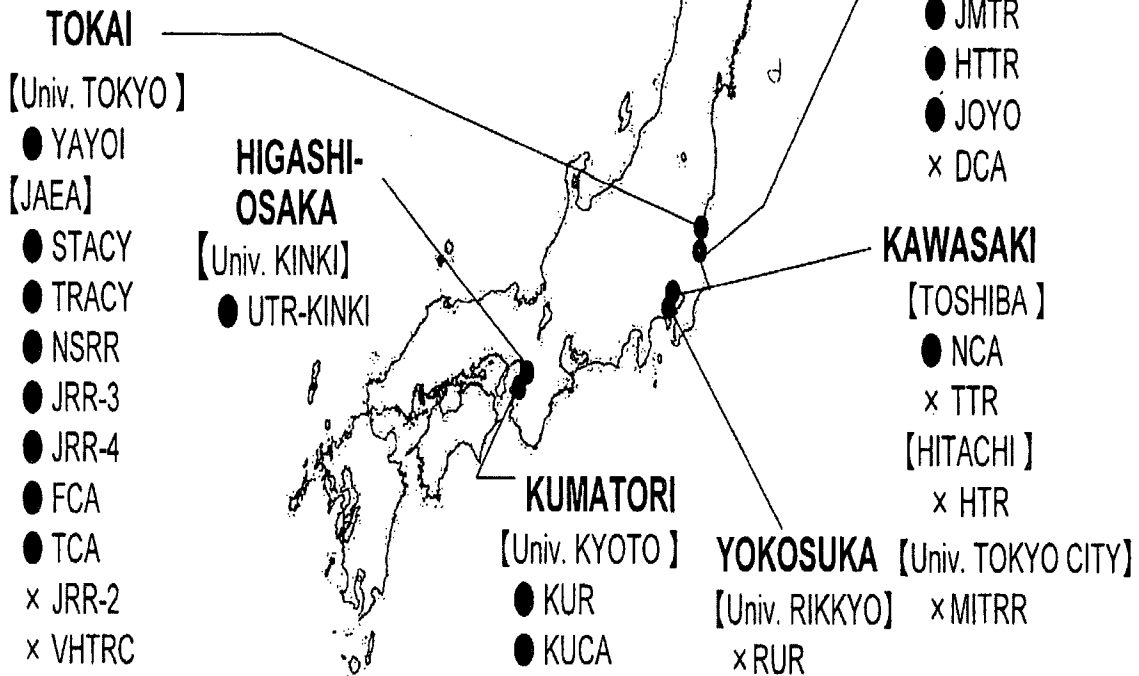
MEXT

MINISTRY OF EDUCATION,  
CULTURE, SPORTS,  
SCIENCE AND TECHNOLOGY

# Site map of Research and Test Reactors in Japan

| Number of Research / Test reactors |    |
|------------------------------------|----|
| ● : In Operation                   | 15 |
| ○ : Under Construction             | 0  |
| × : Decommissioning                | 8  |
| Total                              | 23 |

As of November 2009





## Research Reactors - by country

Click on the name of a reactor to view its full details.

| Country | Facility Name                              | Thermal Power (kW) | Type            | Status | Criticality Date |
|---------|--------------------------------------------|--------------------|-----------------|--------|------------------|
| Japan   | <a href="#">DCA</a>                        | 1.00               | CRIT ASSEMBLY   | SHUT   | 1969/12/28       |
| Japan   | <a href="#">FCA</a>                        | 2.00               | CRIT FAST       | OPER   | 1967/04/29       |
| Japan   | <a href="#">HTR</a>                        | 100.00             | POOL            | SHUT   | 1961/12/25       |
| Japan   | <a href="#">HTRR</a>                       | 30,000.00          | HIGH TEMP GAS   | OPER   | 1998/10/11       |
| Japan   | <a href="#">JMTR</a>                       | 50,000.00          | TANK            | OPER   | 1968/03/30       |
| Japan   | <a href="#">JMTRC</a>                      | 0.10               | POOL            | DECM   | 1965/10/01       |
| Japan   | <a href="#">JOYO</a>                       | 140,000.00         | FAST, NA COOLED | TMSD   | 1977/04/24       |
| Japan   | <a href="#">JRR-2</a>                      | 10,000.00          | TANK            | DECM   | 1960/10/01       |
| Japan   | <a href="#">JRR-3</a>                      | 10,000.00          | HEAVY WATER     | SHUT   | 1962/01/01       |
| Japan   | <a href="#">JRR-3M</a>                     | 20,000.00          | POOL            | OPER   | 1990/03/22       |
| Japan   | <a href="#">JRR-4</a>                      | 3,500.00           | POOL            | OPER   | 1965/01/28       |
| Japan   | <a href="#">KUCA</a>                       | 0.10               | CRIT ASSEMBLY   | OPER   | 1974/08/06       |
| Japan   | <a href="#">KUR</a>                        | 5,000.00           | TANK            | TMSD   | 1964/06/25       |
| Japan   | <a href="#">MUSASHI REACTOR</a>            | 100.00             | TRIGA MARK II   | SHUT   | 1963/01/30       |
| Japan   | <a href="#">NSRR</a>                       | 300.00             | TRIGA ACPR      | OPER   | 1975/06/30       |
| Japan   | <a href="#">STACY</a>                      | 0.20               | HOMOG           | OPER   | 1995/02/23       |
| Japan   | <a href="#">TCA TANK TYPE CRIT. ASSBLY</a> | 0.20               | CRIT ASSEMBLY   | OPER   | 1962/08/23       |
| Japan   | <a href="#">TOSHIBA NCA</a>                | 0.20               | CRIT ASSEMBLY   | OPER   | 1963/12/11       |
| Japan   | <a href="#">TRACY</a>                      | 10.00              | PULSING         | OPER   | 1995/12/20       |
| Japan   | <a href="#">TRIGA-II RIKKYO</a>            | 100.00             | TRIGA MARK II   | SHUT   | 1961/12/08       |
| Japan   | <a href="#">TTR</a>                        | 100.00             | POOL            | SHUT   | 1962/03/13       |
| Japan   | <a href="#">UTR KINKI</a>                  | 0.00               | ARGONAUT        | OPER   | 1961/11/11       |
| Japan   | <a href="#">VHTRC</a>                      | 0.01               | CRIT ASSEMBLY   | DECM   | 1985/05/13       |
| Japan   | <a href="#">YAYOI</a>                      | 2.00               | TANK            | OPER   | 1971/04/10       |

Above data from [RRDB](#) database.

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This page was automatically created on 15 Mar 2011, 17:48:32

Comments to [Project Officer](#)

**Research Reactor Details - HTTR**

|                        |                    |
|------------------------|--------------------|
| <b>Country</b>         | <b>Japan</b>       |
| <b>Facility Name</b>   | <b>HTTR</b>        |
| <b>Facility Number</b> | <b>JP-0023</b>     |
| <b>Status</b>          | <b>OPERATIONAL</b> |
| <b>Last Updated</b>    | <b>2006/04/08</b>  |

**General Data**

|                          |                                                                 |
|--------------------------|-----------------------------------------------------------------|
| <b>Owner</b>             | JAPAN ATOMIC ENERGY AGENCY                                      |
| <b>Operator</b>          | DEPARTMENT OF HTTR PROJECT                                      |
| <b>Licensing</b>         | MINISTRY OF EDUCATION, CULTURE, SPORTS,<br>SCIENCE & TECHNOLOGY |
| <b>Construction Date</b> | 1991/03/15                                                      |
| <b>Criticality Date</b>  | 1998/10/11                                                      |
| <b>Safeguards</b>        | IAEA                                                            |
| <b>Initial Cost</b>      | 700 M US\$                                                      |
| <b>Annual Cost</b>       | 10 M US\$                                                       |
| <b>Total Staff</b>       | 100                                                             |
| <b>No of Operators</b>   | 20                                                              |

**Technical Data**

|                                                      |               |
|------------------------------------------------------|---------------|
| <b>Reactor Type</b>                                  | HIGH TEMP GAS |
| <b>Thermal Power, Steady (kW)</b>                    | 30,000.00     |
| <b>Max Flux SS, Thermal (n/cm<sup>2</sup>-s)</b>     | 7.5 E13       |
| <b>Max Flux SS, Fast (n/cm<sup>2</sup>-s)</b>        | 2E13          |
| <b>Thermal Power, Pulsed (MW)</b>                    | 0.00          |
| <b>Max Flux Pulsed, Thermal (n/cm<sup>2</sup>-s)</b> |               |
| <b>Max Flux Pulsed, Fast (n/cm<sup>2</sup>-s)</b>    |               |
| <b>Moderator</b>                                     | GRAPHITE      |
| <b>Coolant</b>                                       | HELIUM        |
| <b>Natural Convection Cooling</b>                    |               |
| <b>Forced Cooling</b>                                | YES           |
| <b>Core Cooling Velocity (Nominal)</b>               | 12.4 KG/S     |
| <b>Core Cooling Velocity</b>                         |               |

|                                  |          |
|----------------------------------|----------|
| <b>(Emergency)</b>               |          |
| <b>Reflector</b>                 | GRAPHITE |
| <b>Reflector Number of Sides</b> |          |
| <b>Control Rods Material</b>     | B4C      |
| <b>Control Rods number</b>       | 16       |

**Experimental Facilities**

|                                                 |        |
|-------------------------------------------------|--------|
| <b>Horizontal Channels</b>                      |        |
| <b>Horizontal Max Flux (n/cm<sup>2</sup>-s)</b> |        |
| <b>Horizontal Use</b>                           |        |
| <b>Vertical Channels</b>                        |        |
| <b>Vertical Max Flux (n/cm<sup>2</sup>-s)</b>   |        |
| <b>Vertical Use</b>                             |        |
| <b>Core Irradiation Facilities</b>              | 1      |
| <b>Core Max Flux (n/cm<sup>2</sup>-s)</b>       | 9.0E13 |
| <b>Reflector Irradiation Facilities</b>         | 3      |
| <b>Loops Number</b>                             |        |
| <b>Loops Max Flux</b>                           |        |
| <b>Loops use</b>                                |        |

**Fuel data**

|                                   |                 |
|-----------------------------------|-----------------|
| <b>Origin of Fissile Material</b> | FRANCE          |
| <b>Enrichment Supplier</b>        | FRANCE          |
| <b>Equilibrium Core Size</b>      | 150             |
| <b>Plates per Element</b>         |                 |
| <b>Dimensions of Plates</b>       |                 |
| <b>Rods per Element</b>           | 33              |
| <b>Dimensions of Rods, mm</b>     | 34 D X 580 L    |
| <b>Tubes per Element</b>          |                 |
| <b>Dimensions of Tubes, mm</b>    |                 |
| <b>Cladding Material</b>          | C               |
| <b>Cladding Thickness, mm</b>     |                 |
| <b>Fuel Material</b>              | UO <sub>2</sub> |

|                                          |            |
|------------------------------------------|------------|
| <b>Fuel Thickness, mm</b>                | 8 MM       |
| <b>Uranium Density, g/cm<sup>3</sup></b> | 10.4       |
| <b>Burnup on Discharge, max %</b>        | 3.6        |
| <b>Burnup Average, %</b>                 | 2.4        |
| <b>Last Shipment Year</b>                |            |
| <b>Last Receipt Year</b>                 |            |
| <b>Fuel Fabricator</b>                   | NFI, JAPAN |

#### Utilization

|                                        |    |
|----------------------------------------|----|
| <b>Hours per Day</b>                   | 0  |
| <b>Days per Week</b>                   | 0  |
| <b>Weeks per Year</b>                  | 0  |
| <b>MW Days per Year</b>                | 0  |
| <b>Materials/fuel test experiments</b> | NO |
| <b>Isotope Production</b>              | NO |
| <b>Neutron Scattering</b>              | NO |
| <b>Neutron Radiography</b>             | NO |
| <b>Neutron capture therapy</b>         | NO |
| <b>Activation Analysis</b>             | NO |
| <b>Transmutation</b>                   | NO |
| <b>Geochronology</b>                   | NO |
| <b>Teaching</b>                        | NO |
| <b>Training</b>                        | NO |
| <b>Other Uses</b>                      | NO |

#### Operating Experience

| Reactor  |               | Thermal Power | Date of     |              | Operational for |        |
|----------|---------------|---------------|-------------|--------------|-----------------|--------|
| Category | Type          | kW            | Criticality | Construction | Years           | Months |
| TEST     | HIGH TEMP GAS | 30000.00      | 1998/10/11  | 1991/03/15   | 13              | 5      |

Above data from RRDB database.

**Research Reactor Details - JMTR**

|                        |                    |
|------------------------|--------------------|
| <b>Country</b>         | <b>Japan</b>       |
| <b>Facility Name</b>   | <b>JMTR</b>        |
| <b>Facility Number</b> | <b>JP-0015</b>     |
| <b>Status</b>          | <b>OPERATIONAL</b> |
| <b>Last Updated</b>    | <b>2006/04/01</b>  |

**General Data**

|                          |                                                           |
|--------------------------|-----------------------------------------------------------|
| <b>Owner</b>             | JAPAN ATOMIC ENERGY AGENCY                                |
| <b>Operator</b>          | OARAI RESEARCH AND DEVELOPMENT CENTER                     |
| <b>Licensing</b>         | MINISTRY EDUCATION, CULTURE, SPORTS, SCIENCE & TECHNOLOGY |
| <b>Construction Date</b> | 1965/03/22                                                |
| <b>Criticality Date</b>  | 1968/03/30                                                |
| <b>Safeguards</b>        | IAEA                                                      |
| <b>Initial Cost</b>      | 8672 M YEN                                                |
| <b>Annual Cost</b>       | 3000 M YEN                                                |
| <b>Total Staff</b>       | 100                                                       |
| <b>No of Operators</b>   | 28                                                        |

**Technical Data**

|                                                      |                        |
|------------------------------------------------------|------------------------|
| <b>Reactor Type</b>                                  | TANK                   |
| <b>Thermal Power, Steady (kW)</b>                    | 50,000.00              |
| <b>Max Flux SS, Thermal (n/cm<sup>2</sup>-s)</b>     | 4.0E14                 |
| <b>Max Flux SS, Fast (n/cm<sup>2</sup>-s)</b>        | 4.0E14                 |
| <b>Thermal Power, Pulsed (MW)</b>                    | 0.00                   |
| <b>Max Flux Pulsed, Thermal (n/cm<sup>2</sup>-s)</b> |                        |
| <b>Max Flux Pulsed, Fast (n/cm<sup>2</sup>-s)</b>    |                        |
| <b>Moderator</b>                                     | LIGHT WATER            |
| <b>Coolant</b>                                       | LIGHT WATER            |
| <b>Natural Convection Cooling</b>                    |                        |
| <b>Forced Cooling</b>                                | 6000 M <sup>3</sup> /H |
| <b>Core Cooling Velocity (Nominal)</b>               | 10 M/S                 |
| <b>Core Cooling Velocity</b>                         |                        |

|                                  |       |
|----------------------------------|-------|
| <b>(Emergency)</b>               |       |
| <b>Reflector</b>                 | BE-AL |
| <b>Reflector Number of Sides</b> | 4     |
| <b>Control Rods Material</b>     | HF    |
| <b>Control Rods number</b>       | 5     |

#### Experimental Facilities

|                                         |                                                              |
|-----------------------------------------|--------------------------------------------------------------|
| <b>Horizontal Channels</b>              |                                                              |
| <b>Horizontal Max Flux (n/cm2-s)</b>    |                                                              |
| <b>Horizontal Use</b>                   |                                                              |
| <b>Vertical Channels</b>                |                                                              |
| <b>Vertical Max Flux (n/cm2-s)</b>      |                                                              |
| <b>Vertical Use</b>                     |                                                              |
| <b>Core Irradiation Facilities</b>      | 20                                                           |
| <b>Core Max Flux (n/cm2-s)</b>          | 4.0E14                                                       |
| <b>Reflector Irradiation Facilities</b> | 40                                                           |
| <b>Loops Number</b>                     | 2                                                            |
| <b>Loops Max Flux</b>                   | 5.5E13                                                       |
| <b>Loops use</b>                        | ONE HYDRAULIC RABBIT DEVICES AND ONE SHROUD FACILITY (OSF-1) |

#### Fuel data

|                                   |                        |
|-----------------------------------|------------------------|
| <b>Origin of Fissile Material</b> | USA                    |
| <b>Enrichment Supplier</b>        | USA                    |
| <b>Equilibrium Core Size</b>      | 22 STANDARD, 5 CONTROL |
| <b>Plates per Element</b>         | 19                     |
| <b>Dimensions of Plates</b>       | 778 X 70.8 X 1.27      |
| <b>Rods per Element</b>           |                        |
| <b>Dimensions of Rods, mm</b>     |                        |
| <b>Tubes per Element</b>          |                        |
| <b>Dimensions of Tubes, mm</b>    |                        |
| <b>Cladding Material</b>          | AL ALLOY               |
| <b>Cladding Thickness, mm</b>     | 0.38                   |

|                                          |             |
|------------------------------------------|-------------|
| <b>Fuel Material</b>                     | USI2ALX     |
| <b>Fuel Thickness, mm</b>                | 0.51        |
| <b>Uranium Density, g/cm<sup>3</sup></b> | 4.80        |
| <b>Burnup on Discharge, max %</b>        | 60          |
| <b>Burnup Average, %</b>                 | 50          |
| <b>Last Shipment Year</b>                | 2003        |
| <b>Last Receipt Year</b>                 | 2004        |
| <b>Fuel Fabricator</b>                   | CERCA, BWXT |

#### Utilization

|                                        |                                 |
|----------------------------------------|---------------------------------|
| <b>Hours per Day</b>                   | 24                              |
| <b>Days per Week</b>                   | 7                               |
| <b>Weeks per Year</b>                  | 26                              |
| <b>MW Days per Year</b>                | 9000                            |
| <b>Materials/fuel test experiments</b> | Number of runs: N/A             |
| <b>Isotope Production</b>              | 192 Ir; 169 Yb; 188 Re; 177m Lu |
| • Total Activity (GBq)                 | 950000                          |
| <b>Neutron Scattering</b>              | NO                              |
| <b>Neutron Radiography</b>             | NO                              |
| <b>Neutron capture therapy</b>         | NO                              |
| <b>Activation Analysis</b>             | N/A                             |
| • number of samples irradiated         | 2                               |
| <b>Transmutation</b>                   | NO                              |
| <b>Geochronology</b>                   | NO                              |
| <b>Teaching</b>                        | NO                              |
| <b>Training</b>                        | NO                              |
| <b>Other Uses</b>                      | NO                              |

#### Operating Experience

| Reactor  |      | Thermal Power | Date of     |              | Operational for |        |
|----------|------|---------------|-------------|--------------|-----------------|--------|
| Category | Type | kW            | Criticality | Construction | Years           | Months |
| TEST     | TANK | 50000.00      | 1968/03/30  | 1965/03/22   | 43              | 0      |

Above data from RRDB database.



**Research Reactor Details - JRR-3M**

|                        |                    |
|------------------------|--------------------|
| <b>Country</b>         | <b>Japan</b>       |
| <b>Facility Name</b>   | <b>JRR-3M</b>      |
| <b>Facility Number</b> | <b>JP-0008</b>     |
| <b>Status</b>          | <b>OPERATIONAL</b> |
| <b>Last Updated</b>    | <b>2002/08/30</b>  |

**General Data**

|                          |                                                                 |
|--------------------------|-----------------------------------------------------------------|
| <b>Owner</b>             | JAPAN ATOMIC ENERGY RESEARCH INSTITUTE                          |
| <b>Operator</b>          | TOKAI RESEARCH ESTABLISHMENT                                    |
| <b>Licensing</b>         | MINISTRY OF EDUCATION, CULTURE, SPORTS,<br>SCIENCE & TECHNOLOGY |
| <b>Construction Date</b> | 1985/08/02                                                      |
| <b>Criticality Date</b>  | 1990/03/22                                                      |
| <b>Safeguards</b>        | IAEA                                                            |
| <b>Initial Cost</b>      | 32.5 B YEN                                                      |
| <b>Annual Cost</b>       | 1.8 B YEN                                                       |
| <b>Total Staff</b>       | 41                                                              |
| <b>No of Operators</b>   | 25                                                              |

**Technical Data**

|                                           |             |
|-------------------------------------------|-------------|
| <b>Reactor Type</b>                       | POOL        |
| <b>Thermal Power, Steady (kW)</b>         | 20,000.00   |
| <b>Max Flux SS, Thermal (n/cm2-s)</b>     | 2.7 E14     |
| <b>Max Flux SS, Fast (n/cm2-s)</b>        | 1.4E14      |
| <b>Thermal Power, Pulsed (MW)</b>         | 0.00        |
| <b>Max Flux Pulsed, Thermal (n/cm2-s)</b> |             |
| <b>Max Flux Pulsed, Fast (n/cm2-s)</b>    |             |
| <b>Moderator</b>                          | LIGHT WATER |
| <b>Coolant</b>                            | LIGHT WATER |
| <b>Natural Convection Cooling</b>         |             |
| <b>Forced Cooling</b>                     | 2400 M3/HR  |
| <b>Core Cooling Velocity (Nominal)</b>    | 5.9 M/S     |
| <b>Core Cooling Velocity</b>              |             |

|                                  |            |
|----------------------------------|------------|
| <b>(Emergency)</b>               |            |
| <b>Reflector</b>                 | BE,D2O,H2O |
| <b>Reflector Number of Sides</b> | 4          |
| <b>Control Rods Material</b>     | HF         |
| <b>Control Rods number</b>       | 6          |

#### Experimental Facilities

|                                                 |                                                      |
|-------------------------------------------------|------------------------------------------------------|
| <b>Horizontal Channels</b>                      | 9                                                    |
| <b>Horizontal Max Flux (n/cm<sup>2</sup>-s)</b> |                                                      |
| <b>Horizontal Use</b>                           | BEAM EXPERIMENTS                                     |
| <b>Vertical Channels</b>                        | 17                                                   |
| <b>Vertical Max Flux (n/cm<sup>2</sup>-s)</b>   | 2.7E14                                               |
| <b>Vertical Use</b>                             | MATERIAL IRRADIATION TESTS, RADIOISOTOPES PRODUCTION |
| <b>Core Irradiation Facilities</b>              | 9                                                    |
| <b>Core Max Flux (n/cm<sup>2</sup>-s)</b>       | 2.7E14                                               |
| <b>Reflector Irradiation Facilities</b>         | 8                                                    |
| <b>Loops Number</b>                             |                                                      |
| <b>Loops Max Flux</b>                           |                                                      |
| <b>Loops use</b>                                |                                                      |

#### Fuel data

|                                   |                   |
|-----------------------------------|-------------------|
| <b>Origin of Fissile Material</b> | USA               |
| <b>Enrichment Supplier</b>        | USA               |
| <b>Equilibrium Core Size</b>      | 26                |
| <b>Plates per Element</b>         | 21                |
| <b>Dimensions of Plates</b>       | 1.521X 71.0 X 770 |
| <b>Rods per Element</b>           |                   |
| <b>Dimensions of Rods, mm</b>     |                   |
| <b>Tubes per Element</b>          |                   |
| <b>Dimensions of Tubes, mm</b>    |                   |
| <b>Cladding Material</b>          | AL ALLOY          |
| <b>Cladding Thickness, mm</b>     | 0.38              |

|                                          |                    |
|------------------------------------------|--------------------|
| <b>Fuel Material</b>                     | U3O8ALX & U3Si2ALX |
| <b>Fuel Thickness, mm</b>                | 0.51               |
| <b>Uranium Density, g/cm<sup>3</sup></b> | 4.8                |
| <b>Burnup on Discharge, max %</b>        | 60                 |
| <b>Burnup Average, %</b>                 | 30                 |
| <b>Last Shipment Year</b>                |                    |
| <b>Last Receipt Year</b>                 | 2002               |
| <b>Fuel Fabricator</b>                   | CERCA, FRANCE      |

#### Utilization

|                                        |                                                            |
|----------------------------------------|------------------------------------------------------------|
| <b>Hours per Day</b>                   | 24                                                         |
| <b>Days per Week</b>                   | 7                                                          |
| <b>Weeks per Year</b>                  | 28                                                         |
| <b>MW Days per Year</b>                | 3300                                                       |
| <b>Materials/fuel test experiments</b> | Number of runs: 6                                          |
| <b>Isotope Production</b>              | 192Ir, 198Au, 196Yb, 60Co                                  |
| • Total Activity (GBq)                 | 600000                                                     |
| <b>Neutron Scattering</b>              | Neutron scattering                                         |
| • On-line beam hours                   | 926                                                        |
| <b>Neutron Radiography</b>             | On-line beam hours: 1500                                   |
| <b>Neutron capture therapy</b>         | NO                                                         |
| <b>Activation Analysis</b>             | PGNAA, INAA                                                |
| • number of samples irradiated         | 1500                                                       |
| <b>Transmutation</b>                   | Mass of Silicon (kg) : 2354<br>Mass of gemstones (kg): N/A |
| <b>Geochronology</b>                   | Fission Track                                              |
| • number of samples irradiated         | 2                                                          |
| <b>Teaching</b>                        | NO                                                         |
| <b>Training</b>                        | NO                                                         |
| <b>Other Uses</b>                      | NO                                                         |

#### Operating Experience

| Reactor  |      | Thermal Power | Date of     |              | Operational for |        |
|----------|------|---------------|-------------|--------------|-----------------|--------|
| Category | Type | kW            | Criticality | Construction | Years           | Months |
| RESEARCH | POOL | 20000.00      | 1990/03/22  | 1985/08/02   | 21              | 0      |

Above data from RRDB database.

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**From:** Adams, John  
**Sent:** Tuesday, March 15, 2011 12:43 PM  
**To:** NRR\_DPR\_PRLB\_Distribution; NRR\_DPR\_PROB\_Distribution  
**Cc:** LIA11 Hoc  
**Subject:** Availability of the Listing of Japanese RTRs

**Importance:** High

**Categories:** FOIA

Yesterday Patrick Isaac and Jessie Quichocho had pulled together a listing of Japanese RTRs. Both Patrick and Jessie are out of the office today. I am looking for a copy of this listing. If you have a copy could you send it to me.

Thanks

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**From:** Anderson, Joseph  
**Sent:** Tuesday, March 15, 2011 12:38 PM  
**To:** Quinn, Vanessa  
**Cc:** Reed, Elizabeth; LIA11 Hoc  
**Subject:** RE: Sit Report

**Categories:** FOIA

Vanessa – Raised issue with NRC Executive Team. Need you to call into Liaison Team to discuss – Will set up bridge to call in through our Headquarters Operations Officer. Please give me a call to set up a time.

Liaison Team in NRC Operations Center is still being staffed 24/7. Point of contact would be Federal Liaison at (301) 415-5208. Beth Reed is currently on duty.

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**From:** Quinn, Vanessa [mailto:Vanessa.Quinn@dhs.gov]  
**Sent:** Tuesday, March 15, 2011 11:47 AM  
**To:** Anderson, Joseph  
**Cc:** Quinn, Vanessa; Sherwood, Harry; Kish, James; Greten, Timothy  
**Subject:** Sit Report

Joe

Your Sit Report -- you provide to us -- the regions are asking if they can share with the states, we have told them no. Is there anything that you can provide to us that we can share with the States?

Vanessa E. Quinn  
Branch Chief, REP Program  
Technological Hazards Division  
National Preparedness Directorate  
DHS/FEMA

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**From:** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 12:34 PM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** Update  
**Attachments:** Talking Points 0315 @1130.docx  
  
**Categories:** FOIA

Attached is the latest Talking Points for our use.

Questions and Answers for Chairman Jaczko

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

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

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

Additional technical, non-public information:

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

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

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

Additional technical, non-public information:

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

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

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

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

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

**Questions and Answers developed by Rob Taylor**

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

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

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

Additional technical, non-public information:

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

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

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

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

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



Additional technical, non-public information:

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

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

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

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

Additional, technical, non-public information:

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

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

## **7. What happens when/if a plant “melts down”?**

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

Additional, technical, non-public information:

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

**8. Why is KI administered during nuclear emergencies?**

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

Additional, technical non-public information.

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

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

Public Answer: No

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

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

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

Additional, technical, non-public information.

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

**11. Will this incident affect new reactor licensing?**

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

Additional, technical non-public information:

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

**12. What magnitude earthquake are US plants designed to?**

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

Additional, technical non-public information:

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

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

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

Additional, technical non-public information: No additional.

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

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

Additional, technical non-public information: None

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

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

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

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

Additional Information

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

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

**16. What resources are the Japanese asking for?**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**27. Are we providing additional KI to the Japanese?**

We have not been asked to provide KI.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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**From:** LIA01 Hoc  
**Sent:** Tuesday, March 15, 2011 12:25 PM  
**To:** LIA07 Hoc; LIA08 Hoc; LIA11 Hoc  
**Subject:** FW: TEPCO Earthquake Information Update as of March 15, 1300(JST) - Fukushima Daiichi NPS  
**Attachments:** Fukushima daiichi unit1-3 parameter.xls  
**Categories:** FOIA

Should we forward to PMT and RST?

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**From:** Michael W. Chinworth [mailto:michael-chinworth@jnes-usa.org]  
**Sent:** Tuesday, March 15, 2011 12:19 PM  
**To:** LIA02 Hoc; LIA03 Hoc; LIA01 Hoc  
**Subject:** Fwd: TEPCO Earthquake Information Update as of March 15, 1300(JST) - Fukushima Daiichi NPS

----- Original Message -----

**Subject:** TEPCO Earthquake Information Update as of March 15, 1300(JST) - Fukushima Daiichi NPS  
**Date:** Tue, 15 Mar 2011 16:19:16 +0000  
**From:** [matsuo.kenji@tepcoco.jp](mailto:matsuo.kenji@tepcoco.jp) <[matsuo.kenji@tepcoco.jp](mailto:matsuo.kenji@tepcoco.jp)>  
**To:** [matsuo.kenji@tepcoco.jp](mailto:matsuo.kenji@tepcoco.jp) <[matsuo.kenji@tepcoco.jp](mailto:matsuo.kenji@tepcoco.jp)>

Dear Friends,

The following is status of Fukushima-Daiichi NPS as of 13:00, March 15.

Units 1,2 and 3 continues water injection using fire engine (sea water).

The status is stable right now (around 11:00pm).

Atteched is plant parameters of units 1,2 and 3. (water level, reactor pressure, D/W pressure, S/C pressure)

Contacts:

TEPCO Washington Office 202-457-0790

Kenji Matsuo, General Manager



Yuichi Nagano, Deputy General Manager,  
Masayuki Yamamoto, Manager, Nuclear Power Programs

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Plant Status of Fukushima Daiichi Nuclear Power Station (as of 13:00 Mar 15th)

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

Unit 1(Shut down)

- Reactor has been shut down. However, the explosive sound and white smoke were confirmed after the big quake occurred at 3:36PM Mar 12th. It was assumed to be hydrogen explosion and currently under the investigation.
- We have been injecting sea water into the reactor pressure vessel.

Unit 2(Shut down)

- Reactor has been shut down and Reactor Core Isolation Cooling System has been injecting water to the reactor. However, reactor pressure has increased because the system stopped, causing reactor water level to drop. Following the instruction by the government and with fully securing safety, measure to lower the pressure level within the reactor containment vessel and injection of sea water were taken, reactor pressure and water level resumed.
- We are continuing the injection of sea water into the reactor.
- At approximately 6:00am, an abnormal noise began emanating from nearby Pressure Suppression Chamber and the pressure within this chamber decreased.
- While we continue sea water injection operations, the temporary transfer of TEPCO employees and workers from other companies not directly involved in this work has begun.

Unit 3(Shut down)

- Reactor has been shut down. However, the explosive sound and white smoke were confirmed at 11:01AM Mar 14th. It was assumed to be hydrogen explosion and currently under the investigation.
- Also, we restarted the injection of sea water to the reactor at 2:30am Mar 15th , which was temporarily stopped.

Unit 4 (shut down due to regular inspection)

- Reactor has been shut down and sufficient level of reactor coolant to ensure safety is maintained.
- Currently, we do not believe there is any reactor coolant leakage inside the reactor containment vessel.
- We have confirmed the sustained damage around the 5th floor rooftop area of the Nuclear Reactor Building.
- Afterwards, we confirmed the outbreak of fire at the northwestern part of Nuclear Reactor Building. We immediately reported this matter to the fire department and the related authorities.

-However, at approximately 11:00am, when TEPCO employee arrived at the scene to confirm, the fire had already died down. We will continue to monitor the situation carefully.

#### Unit 5 (outage due to regular inspection)

- Reactor has been shut down and sufficient level of reactor coolant to ensure safety is maintained.
- Currently, we do not believe there is any reactor coolant leakage inside the reactor containment vessel.

#### Unit 6 (outage due to regular inspection)

- Reactor has been shut down and sufficient level of reactor coolant to ensure safety is maintained.
- Currently, we do not believe there is any reactor coolant leakage inside the reactor containment vessel.

#### Casualty

- 2 workers of cooperative firm were injured at the occurrence of the earthquake, and were transported to the hospital.
- 1 TEPCO employee who was not able to stand by his own with his hand holding left chest was transported to the hospital by an ambulance.
- 1 subcontract worker at important earthquake-proof building was unconscious and transported to the hospital by an ambulance.
- The radiation exposure of 1 TEPCO employee, who was working inside the reactor building, exceeded 100mSv and was transported to the hospital.
- 2 TEPCO employees felt bad during their operation in the central control rooms of Unit 1 and 2 while wearing full masks, and were transferred to Fukushima Daini Power Station for consultation with a medical advisor.
- 4 workers were injured and transported to the hospital after explosive sound and white smoke were confirmed around the Unit 1.
- 11 workers were injured and transported to Fukushima Daini Nuclear Power Station after explosive sound and white smoke were confirmed around the Unit 3.
- Presence of 2 TEPCO employees at the site is not confirmed.

#### Others

- We are currently coordinating with the relevant authorities and departments as to how to secure the cooling water to cool down the water in the spent nuclear fuel pool.
- We measured radioactive materials inside of the nuclear power station area (outdoor) by monitoring car and confirmed that radioactive materials level is getting higher than ordinary level. As listed below, we have determined that specific incidents stipulated in article 15, clause 1(Abnormal increase in radiation dose measured at site boundary) have occurred.
  - Determined at 4:17 pm Mar 12th (Around Monitoring Post 4 )
  - Determined at 8:56 am Mar 13th (Around Monitoring Post 4 )
  - Determined at 2:15 pm Mar 13th (Around Monitoring Post 4 )
  - Determined at 3:50 am Mar 14th (Around Monitoring Post 6 )

- Determined at 4:15 am Mar 14th (Around Monitoring Post 2 )

(Above are previously announced)

- Determined at 9:27 am Mar 14th (Around Monitoring Post 3 )

- Determined at 9:37 pm Mar 14th (Around main entrance )

- Determined at 6:51 am Mar 15th (Around main entrance )

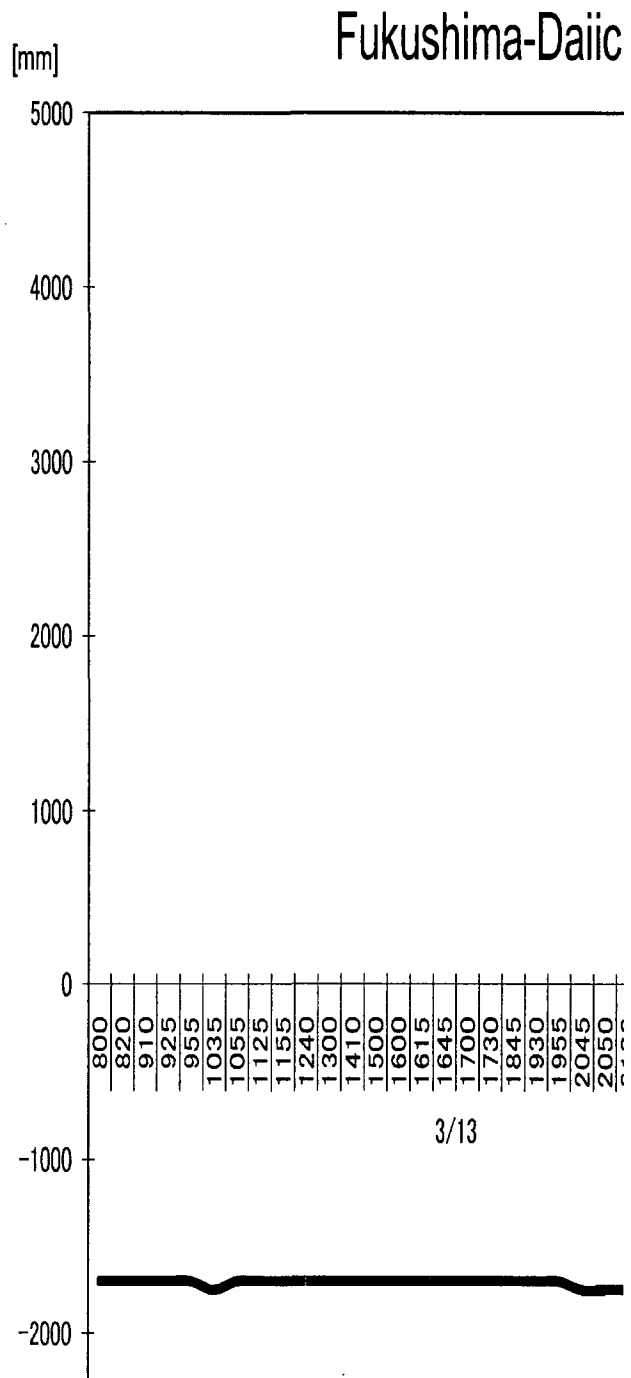
- Determined at 8:11 am Mar 15th (Around main entrance )

-We will continue to make announcements when it was determined that a specific incident stipulated in article 15, clause 1 has occurred.

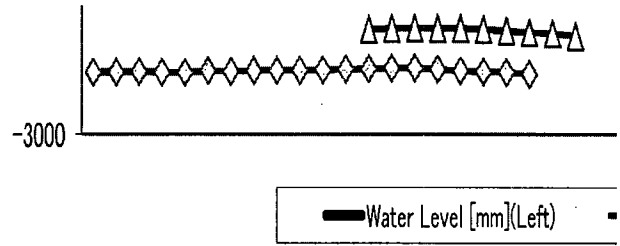
-The national government has instructed evacuation for those local residents within 20km radius of the periphery because it's possible that radioactive materials are discharged.

-We will continue to take all measures to restore the security of the site and to monitor the environment of the site periphery.

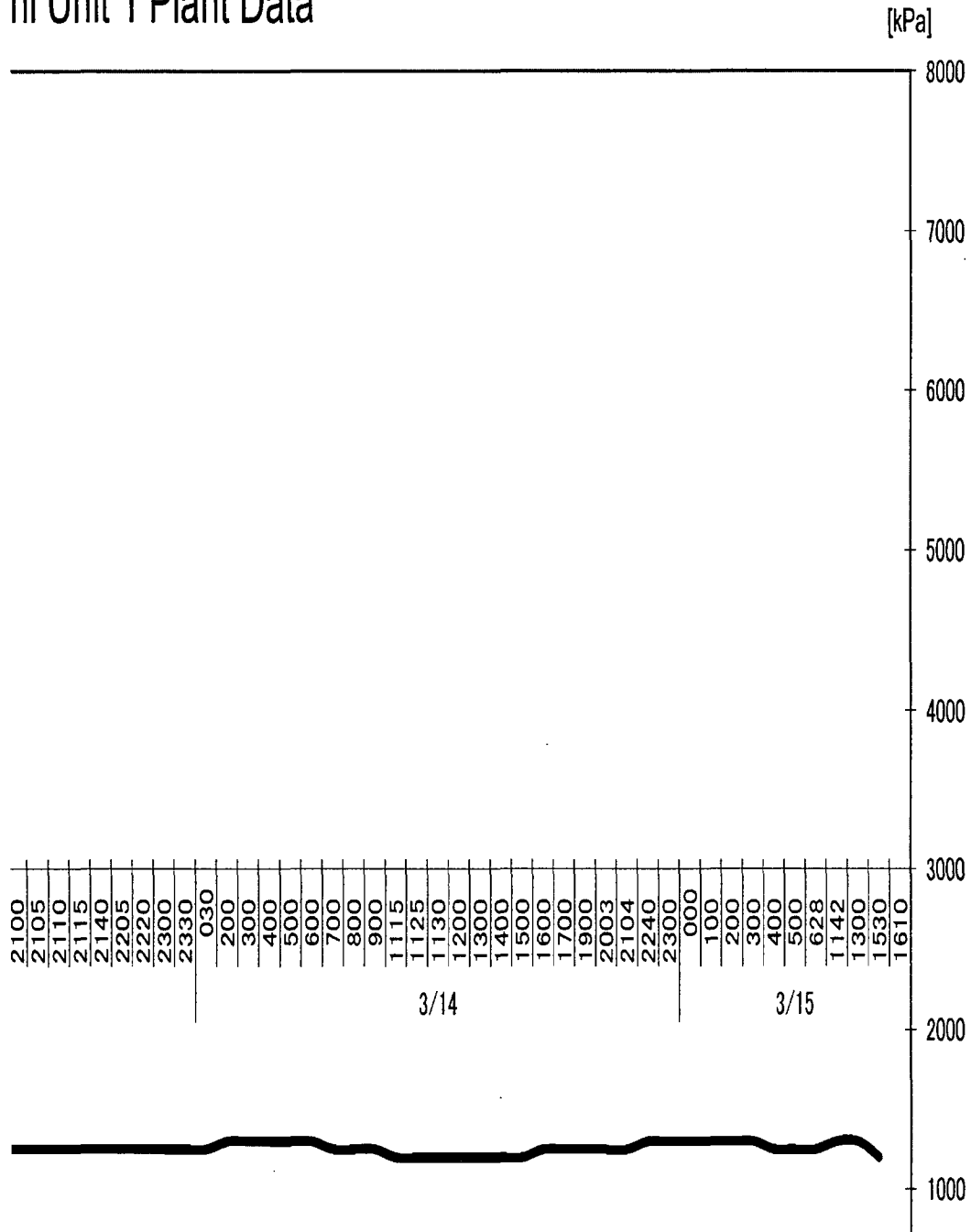
|      |       | Water Level | Ractor Pre | Drywell Pre | S/C Pressure [kPa] |
|------|-------|-------------|------------|-------------|--------------------|
| 3/13 | 800   | -1700       | 353        |             |                    |
|      | 820   | -1700       | 356        |             |                    |
|      | 910   | -1700       | 358        |             |                    |
|      | 925   | -1700       | 353        |             |                    |
|      | 955   | -1700       | 353        |             |                    |
|      | 1035  | -1750       | 362        |             |                    |
|      | 1055  | -1700       | 358        |             |                    |
|      | 1125  | -1700       | 364        |             |                    |
|      | 1155  | -1700       | 364.5      |             |                    |
|      | 1240  | -1700       | 364.5      |             |                    |
|      | 1300  | -1700       | 366.8      |             |                    |
|      | 1410  | -1700       | 371.3      |             |                    |
|      | 1500  | -1700       | 373.5      | 600         |                    |
|      | 1600  | -1700       | 378        | 605         |                    |
|      | 1615  | -1700       | 378        | 606         |                    |
|      | 1645  | -1700       | 371.3      | 605         |                    |
|      | 1700  | -1700       | 362.3      | 605         |                    |
|      | 1730  | -1700       | 357.8      | 600         |                    |
|      | 1845  | -1700       | 353.3      | 590         |                    |
|      | 1930  | -1700       | 342.2      | 580         |                    |
|      | 1955  | -1700       |            | 575         |                    |
|      | 2045  | -1750       |            | 560         |                    |
|      | 2050  | -1750       |            |             |                    |
|      | 2100  | -1750       |            |             |                    |
|      | 2105  | -1750       |            |             |                    |
|      | 2110  | -1750       |            |             |                    |
|      | 2115  | -1750       |            |             |                    |
| 2140 | -1750 | 342         | 550        | 550         |                    |
| 2205 | -1750 | 342         | 540        | 540         |                    |
| 2220 | -1750 | 333         | 540        | 540         |                    |
| 2300 | -1750 | 333         | 540        | 530         |                    |
| 2330 | -1750 | 324         | 530        | 530         |                    |
| 3/14 | 030   | -1750       | 324        | 530         | 530                |
|      | 200   | -1700       | 315        | 510         | 505                |
|      | 300   | -1700       | 306        | 505         | 500                |

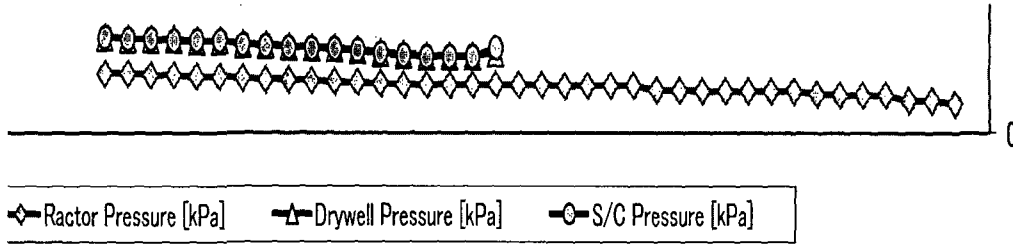


|      |       |       |     |     |
|------|-------|-------|-----|-----|
| 400  | -1700 | 304   | 495 | 490 |
| 500  | -1700 | 299   | 490 | 485 |
| 600  | -1700 | 293   | 485 | 480 |
| 700  | -1750 | 288   | 475 | 470 |
| 800  | -1750 | 284   | 460 | 455 |
| 900  | -1750 | 275   | 450 | 445 |
| 1115 | -1800 | 275   | 440 | 435 |
| 1125 | -1800 | 275   | 440 | 435 |
| 1130 | -1800 | 275   | 440 | 435 |
| 1200 | -1800 | 275   | 460 | 485 |
| 1300 | -1800 | 275   |     |     |
| 1400 | -1800 | 275   |     |     |
| 1500 | -1800 | 268   |     |     |
| 1600 | -1750 | 270   |     |     |
| 1700 | -1750 | 270   |     |     |
| 1900 | -1750 | 270   |     |     |
| 2003 | -1750 | 245   |     |     |
| 2104 | -1750 | 243   |     |     |
| 2240 | -1700 | 240   |     |     |
| 2300 | -1700 | 240   |     |     |
| 3/15 | 000   | -1700 | 240 |     |
|      | 100   | -1700 | 240 |     |
|      | 200   | -1700 | 240 |     |
|      | 300   | -1700 | 223 |     |
|      | 400   | -1750 | 216 |     |
|      | 500   | -1750 | 216 |     |
|      | 628   | -1750 | 216 |     |
|      | 1142  | -1700 | 185 |     |
|      | 1300  | -1700 | 185 |     |
|      | 1530  | -1800 | 166 |     |
|      | 1610  |       |     |     |



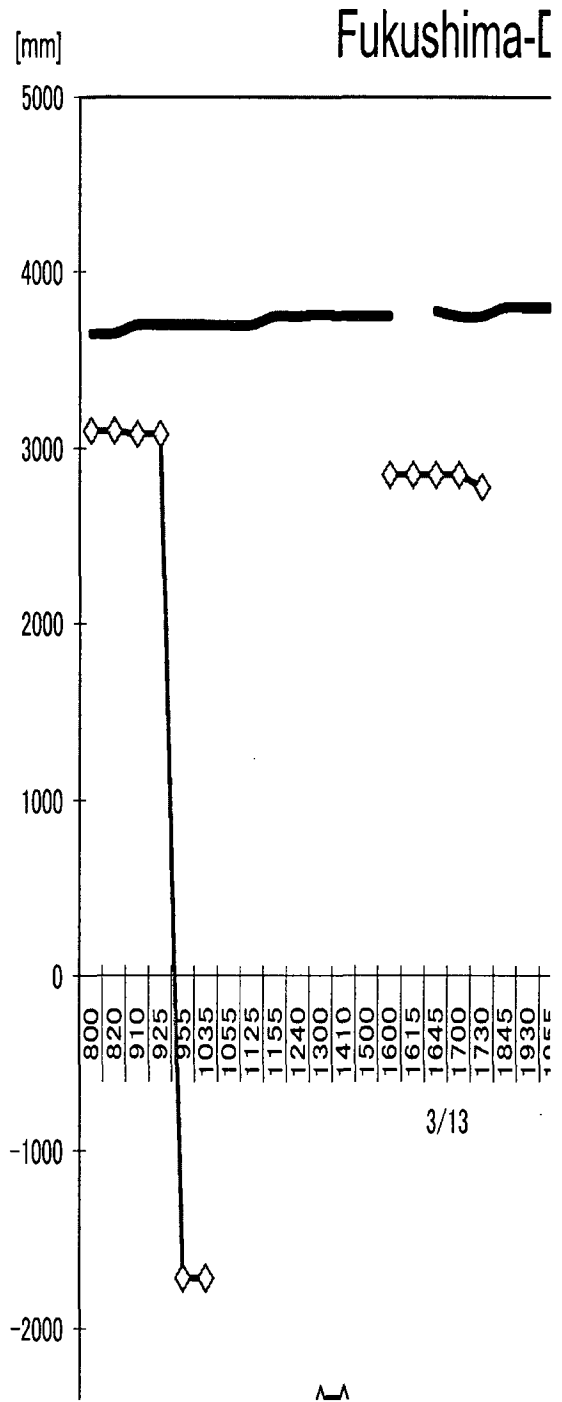
# hi Unit 1 Plant Data





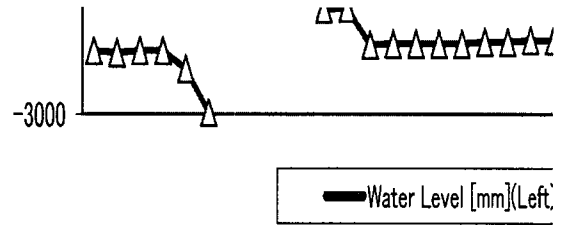
Water Lev | Ractor Pre | Drywell Pr | S/C Pressure [kPa]

|      |      |      |      |     |
|------|------|------|------|-----|
| 3/13 | 800  | 3650 | 6100 | 360 |
|      | 820  | 3650 | 6100 | 350 |
|      | 910  | 3700 | 6080 | 360 |
|      | 925  | 3700 | 6080 | 360 |
|      | 955  | 3700 | 1283 | 260 |
|      | 1035 | 3700 | 1283 | 10  |
|      | 1055 | 3700 |      |     |
|      | 1125 | 3700 |      |     |
|      | 1155 | 3750 |      |     |
|      | 1240 | 3750 |      |     |
|      | 1300 | 3760 |      | 595 |
|      | 1410 | 3750 |      | 600 |
|      | 1500 | 3750 |      | 395 |
|      | 1600 | 3750 | 5850 | 400 |
|      | 1615 |      | 5850 | 400 |
|      | 1645 | 3780 | 5850 | 400 |
|      | 1700 | 3750 | 5850 | 400 |
|      | 1730 | 3750 | 5780 | 410 |
|      | 1845 | 3800 |      | 410 |
|      | 1930 | 3800 |      | 420 |
|      | 1955 | 3800 |      | 420 |
|      | 2045 | 3800 |      | 420 |
|      | 2050 | 3800 |      |     |
|      | 2100 |      |      |     |
|      | 2105 |      |      |     |
|      | 2110 |      |      |     |
|      | 2115 |      |      |     |
|      | 2140 |      |      | 425 |
|      | 2205 | 3800 |      | 425 |
|      | 2220 | 3900 |      | 430 |
|      | 2300 | 3900 |      | 430 |
|      | 2330 | 3900 |      | 435 |
| 3/14 | 030  | 3900 |      | 436 |
|      | 200  | 3900 |      | 440 |
|      | 300  | 3900 | 5450 |     |

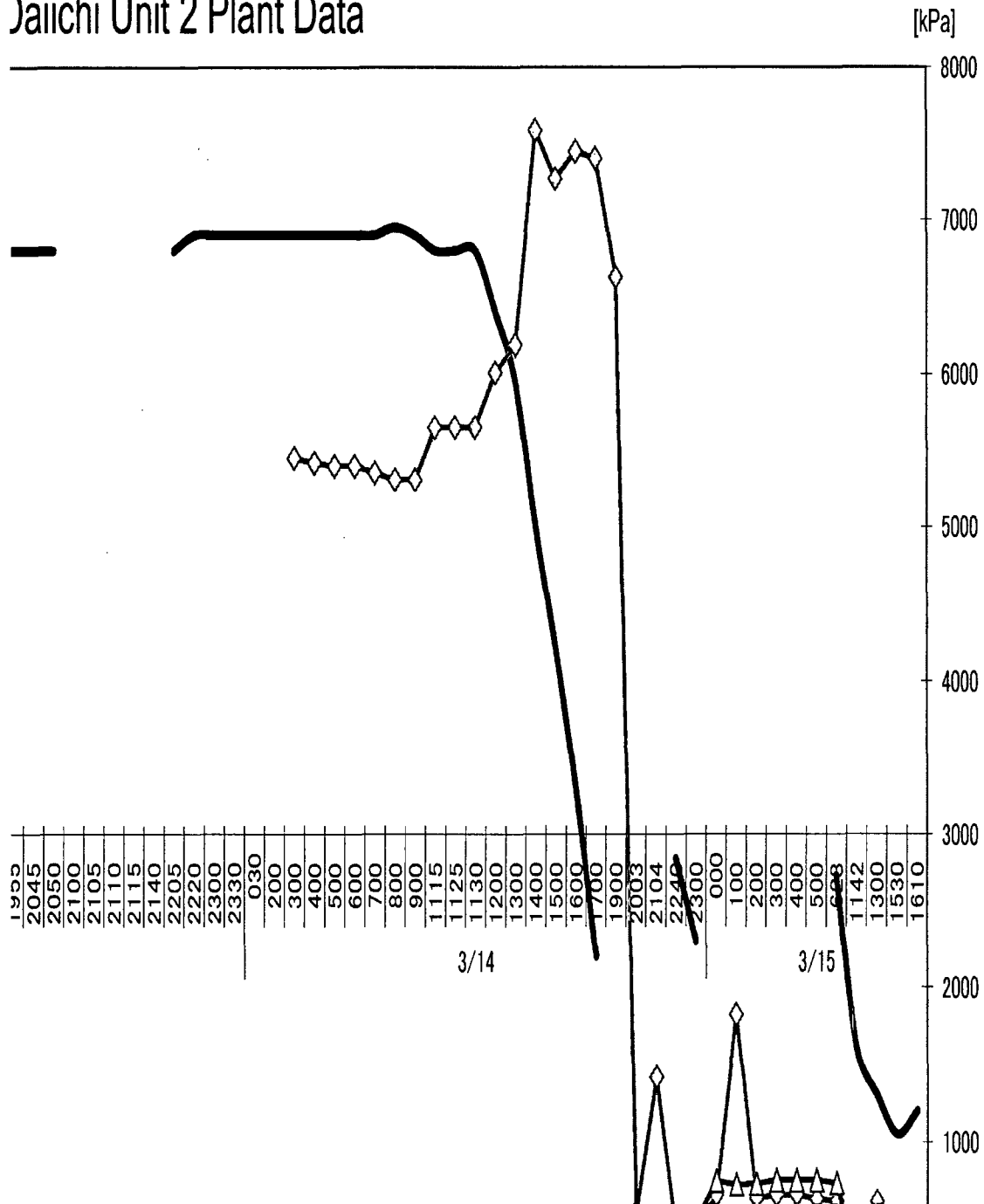




|       |      |       |     |     |     |
|-------|------|-------|-----|-----|-----|
| 400   | 3900 | 5420  |     |     |     |
| 500   | 3900 | 5400  | 467 | 467 |     |
| 600   | 3900 | 5400  | 467 | 467 |     |
| 700   | 3900 | 5355  | 455 | 455 |     |
| 800   | 3950 | 5310  | 474 | 474 |     |
| 900   | 3900 | 5310  | 460 | 478 |     |
| 1115  | 3800 | 5648  | 460 | 481 |     |
| 1125  | 3800 | 5648  | 460 | 481 |     |
| 1130  | 3800 | 5648  | 460 | 481 |     |
| 1200  | 3400 | 6008  | 460 | 485 |     |
| 1300  | 2950 | 6188  | 465 | 486 |     |
| 1400  | 2000 | 7583  | 460 |     |     |
| 1500  | 1200 | 7268  | 440 |     |     |
| 1600  | 300  | 7448  | 420 |     |     |
| 1700  | -800 | 7403  |     |     |     |
| 1900  |      | 6630  | 400 |     |     |
| 2003  |      | 540   | 400 |     |     |
| 2104  |      | 1418  | 419 |     |     |
| 2240  | -160 | 405   | 480 |     |     |
| 2300  | -700 | 428   | 482 |     |     |
| <hr/> |      |       |     |     |     |
| 3/15  | 000  | 653   | 745 | 350 |     |
|       | 100  | 1823  | 720 | 300 |     |
|       | 200  | 630   | 725 | 330 |     |
|       | 300  | 653   | 750 | 330 |     |
|       | 400  | 653   | 750 | 330 |     |
|       | 500  | 626   | 750 | 330 |     |
|       | 628  | -270  | 612 | 730 | 300 |
|       | 1142 | -1400 | 315 | 155 | 0   |
|       | 1300 | -1700 | 608 | 415 |     |
|       | 1530 | -1950 | 113 | 275 |     |
|       | 1610 | -1800 | 113 | 270 |     |

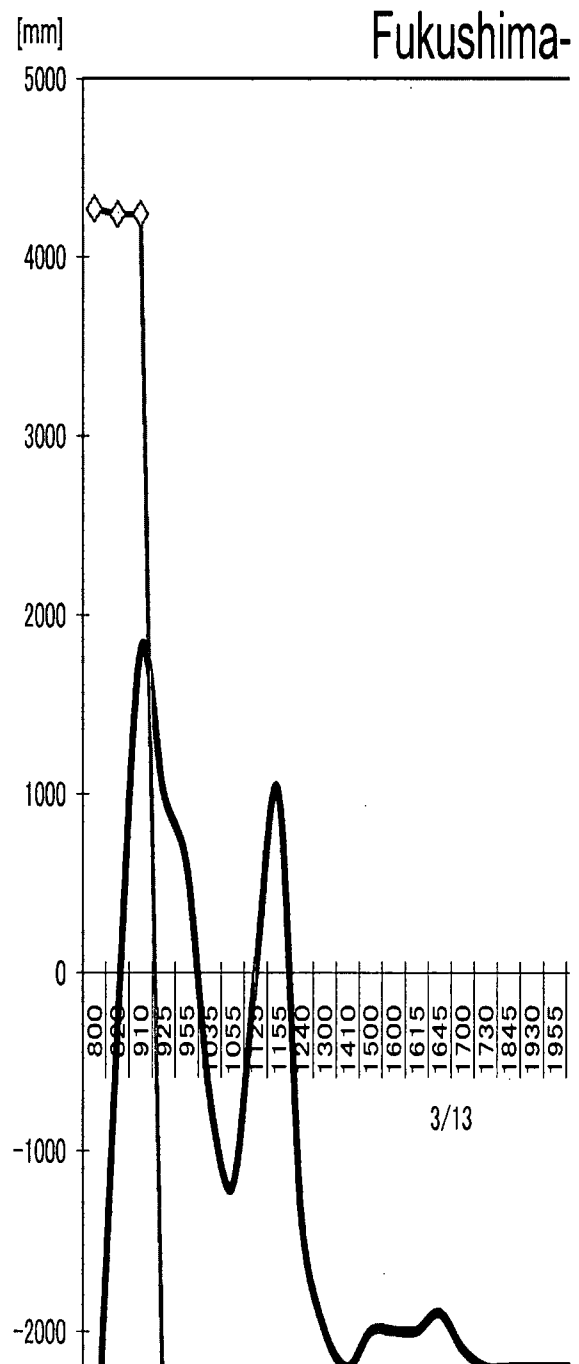


# Jaiichi Unit 2 Plant Data

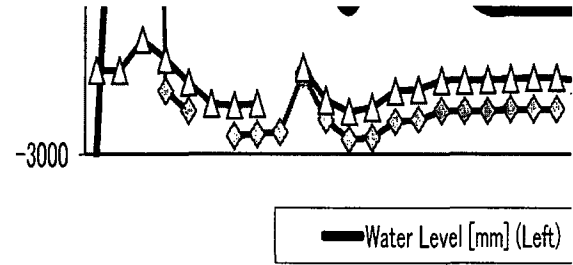




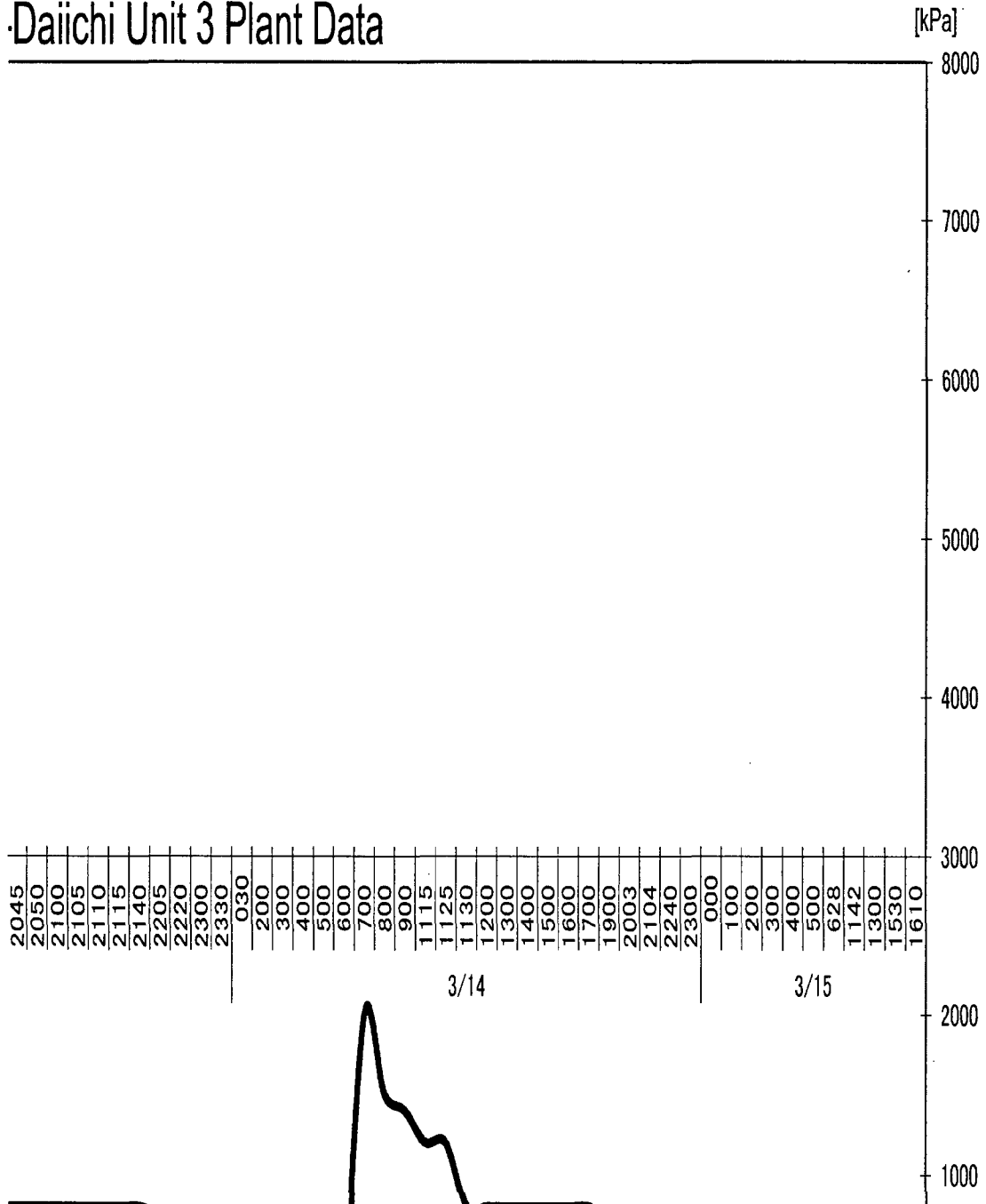
|      |       | Water Level | Ractor Pre | Drywell Pre | S/C Pressure [kPa] |
|------|-------|-------------|------------|-------------|--------------------|
| 3/13 | 800   | -3000       | 7270       | 466         |                    |
|      | 820   | -325        | 7240       | 465         |                    |
|      | 910   | 1800        | 7240       | 637         |                    |
|      | 925   | 1000        | 350        | 530         |                    |
|      | 955   | 600         | 240        | 400         |                    |
|      | 1035  | -700        |            | 280         |                    |
|      | 1055  | -1200       | 100        | 270         |                    |
|      | 1125  | 0           | 110        | 280         |                    |
|      | 1155  | 1000        | 120        |             |                    |
|      | 1240  | -1400       | 450        | 480         |                    |
|      | 1300  | -2000       | 190        | 300         |                    |
|      | 1410  | -2200       | 80         | 235         |                    |
|      | 1500  | -2000       | 90         | 260         |                    |
|      | 1600  | -2000       | 180        | 350         |                    |
|      | 1615  | -2000       | 190        | 360         |                    |
|      | 1645  | -1900       | 240        | 410         |                    |
|      | 1700  | -2100       | 240        | 410         |                    |
|      | 1730  | -2200       | 240        | 415         |                    |
|      | 1845  | -2200       | 250        | 420         |                    |
|      | 1930  | -2200       | 250        | 425         |                    |
|      | 1955  | -2200       | 250        | 425         |                    |
|      | 2045  | -2200       |            | 410         |                    |
|      | 2050  | -2200       |            | 405         |                    |
| 2100 | -2200 |             | 400        |             |                    |
| 2105 | -2200 |             | 395        |             |                    |
| 2110 | -2200 |             | 380        |             |                    |
| 2115 | -2200 |             | 380        |             |                    |
| 2140 | -2200 |             | 375        | 320         |                    |
| 2205 | -2250 |             | 320        | 300         |                    |
| 2220 | -2250 |             | 300        | 295         |                    |
| 2300 | -2250 | 89          | 295        | 275         |                    |
| 2330 | -2250 | 68          | 275        | 260         |                    |
| 3/14 | 030   | -2250       | 51         | 260         | 255                |
|      | 200   | -2300       | 77         | 265         | 275                |
|      | 300   | -2800       | 134        | 275         | 305                |

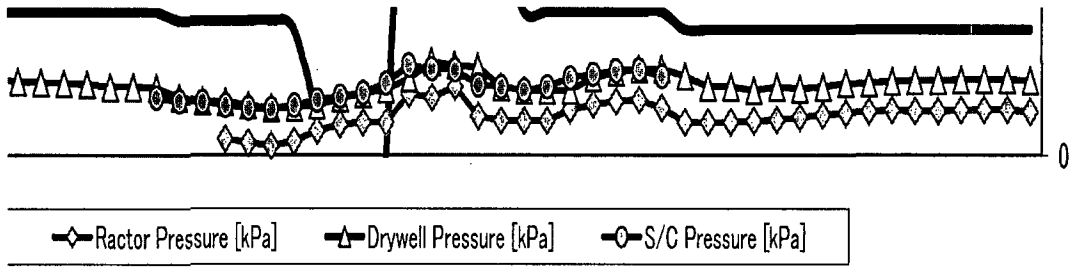


|      |       |       |     |     |
|------|-------|-------|-----|-----|
| 400  |       | 169   | 315 | 325 |
| 500  |       | 181   | 340 | 345 |
| 600  | -3000 | 181   | 365 | 400 |
| 700  | -1000 | 338   | 425 | 500 |
| 800  | -1500 | 320   | 520 | 480 |
| 900  | -1600 | 380   | 500 | 475 |
| 1115 | -1800 | 215   | 490 | 390 |
| 1125 | -1800 | 191   | 380 | 380 |
| 1130 | -2200 | 190   | 360 | 360 |
| 1200 | -2200 | 191   | 360 | 380 |
| 1300 | -2200 | 251   | 360 | 430 |
| 1400 | -2200 | 281   | 430 | 450 |
| 1500 | -2200 | 298   | 460 | 470 |
| 1600 | -2200 | 306   | 480 | 475 |
| 1700 | -2200 | 261   | 480 | 440 |
| 1900 | -2300 | 183   | 440 |     |
| 2003 | -2300 | 183   | 380 |     |
| 2104 | -2300 | 183   | 380 |     |
| 2240 | -2300 | 189   | 360 |     |
| 2300 | -2300 | 196   | 380 |     |
| 3/15 | 000   | -2300 | 210 | 370 |
|      | 100   | -2300 | 223 | 380 |
|      | 200   | -2300 | 234 | 400 |
|      | 300   | -2300 | 242 | 400 |
|      | 400   | -2300 | 249 | 410 |
|      | 500   | -2300 | 244 | 415 |
|      | 628   | -2300 | 244 | 415 |
|      | 1142  | -2300 | 249 | 420 |
|      | 1300  | -2300 | 251 | 420 |
|      | 1530  | -2300 | 251 | 420 |
|      | 1610  | -2300 | 240 | 415 |



# Daiichi Unit 3 Plant Data





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**From:** HOO Hoc  
**Sent:** Friday, March 18, 2011 12:09 PM  
**To:** LIA07 Hoc; OST01 HOC; OST02 HOC; OST03 HOC  
**Subject:** FW: Information Sheet Regarding Fukushima Nuclear Power Station  
**Attachments:** FEPC Update to Information Sheet 11 03 18 final.doc; 0318\_1600\_Readings at Monitoring Post out of 20km Zone of Fukushima Dai-ichi.pdf; 0318\_1900\_Readings at Monitoring Post out of 20km Zone of Fukushima Dai-ichi.pdf; image001.jpg

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



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**From:** Hiltz, Thomas  
**Sent:** Friday, March 18, 2011 12:01 PM  
**To:** HOO Hoc; Bailey, Marissa; Tschiltz, Michael; Kinneman, John; Haney, Cathériné; Dorman, Dan  
**Subject:** FW: Information Sheet Regarding Fukushima Nuclear Power Station

---

**From:** Kazuhiko Hiruta [<mailto:Hiruta@denjiren.com>]  
**Sent:** Friday, March 18, 2011 11:18 AM  
**To:** Kazuhiko Hiruta  
**Subject:** Information Sheet Regarding Fukushima Nuclear Power Station

Dear friends,

Please find information about the incidents at Fukushima Nuclear Power Station. If you have questions, please feel free to contact me.

Best regards,  
Kazu

=====  
**Kazuhiko HIRUTA**  
**FEPC Washington Office**  
"The Federation of Electric Power Companies of Japan"  
1901 L Street NW Suite 600 Washington, DC 20036  
tel: 202-466-3507  
cell: (b)(6)  
fax: 202-466-6758  
=====



---

**From:** Marshall, Jane  
**Sent:** Tuesday, March 15, 2011 1:23 PM  
**To:** RMTFACTSU\_ELNRC  
**Subject:** RE: Dosimeters issue

I understand from the current PMT director that the task is complete. I sent Julie a note to see if she has what she needs...

---

**From:** RMTFACTSU\_ELNRC [RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Tuesday, March 15, 2011 12:22 PM  
**To:** Marshall, Jane  
**Subject:** RE: Dosimeters issue

Thanks, we are going to try to be on the 2 pm call as well for awareness.

---

**From:** Marshall, Jane [mailto:Jane.Marshall@nrc.gov]  
**Sent:** Tuesday, March 15, 2011 12:21 PM  
**To:** RMTFACTSU\_ELNRC  
**Subject:** RE: Dosimeters issue

Yep, Julie is lead. Yep, NRC got the tasker - I'll check on it in a couple of minutes.

---

**From:** RMTFACTSU\_ELNRC [RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Tuesday, March 15, 2011 12:12 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc  
**Cc:** Marshall, Jane; Gott, William; Grant, Jeffery  
**Subject:** Dosimeters issue

Folks,

(b)(5)

Questions for you:

1. Did this action actually get picked up by the NRC.
2. Who is tasked with determining the proper dosimeter / monitoring equipment for this task.
3. What is the status of this task.

Thanks for the help.

Jason Kozal

(b)(6)

---

**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Tuesday, March 15, 2011 11:41 AM  
**To:** (b)(6)  
**Cc:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc; Marshall, Jane; Gott, William; Grant, Jeffery  
**Subject:** FW: Tokyo Electric Power Company to General Electric Company Request  
**Categories:** FOIA

Jim,

Don't know if you are up still, but we are working on validating this request. When you are conscious let us know if you know anything about it and if it is a valid request. Todd Horne, the RMT logistics coordinator will need to validate it for USAID purposes.

Jason Kozal

(b)(6)

-----Original Message-----

**From:** RMTPACTSU\_CRO  
**Sent:** Tuesday, March 15, 2011 11:26 AM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** FW: Tokyo Electric Power Company to General Electric Company Request

-----Original Message-----

**From:** (b)(6)  
[mailto:(b)(6)]  
**Sent:** Tuesday, March 15, 2011 11:24 AM  
**To:** (b)(6)  
**Cc:** (b)(6)  
(b)(6)  
**Subject:** Tokyo Electric Power Company to General Electric Company Request

Tom,

US-based General Electric has just received a telephonic request from Tokyo Electric Power (the company that owns the nuclear reactors) for 10 Generator sets, each the equivalent of a 747 engine. The generators are located in Pensacola, Houston, and Budapest. POCs at GE are Mr. Steve Newbold, 202-637-4004, and Mr. Rich Douglas, 202-637-4212. I have indicated to the gentlemen, I would contact USAIDs Response Management Team (RMT) for further information.

Vr

(JO)

JONELLE M MARTINEZ, LTC  
USTRANSCOM J3-SS, STANDARDS BRANCH  
DSN 312-770-5748  
CML (b)(6)

---

**From:** Kozal, Jason  
**Sent:** Tuesday, March 15, 2011 12:56 PM  
**To:** Foggie, Kirk; Dudek, Michael; Kowalczyk, Jeffrey  
**Cc:**

(b)(6)

**Subject:** RE: Status

All,

Important:

Mr. Casto - A car has been arranged to pick you up at the airport and take you directly to the Embassy.

Everyone else - you need to arrange transport to the hotel from the airport, there are airport limos, taxis, and trains available. Please check with airport staff to asses the most viable option. If you have questions or trouble with the transportation and accomadations please call the USAID contact Amy Sink (b)(6)

Info on pay/travel stuff.

Use your Govt issued credit card no problem there.

Per Diem is on a reimburable basis.

There is no advance of funds, the banking info that we collected is to pay the reimbursements later, if you need cash you will have to use the card for a cash withdrawl.

For the hotel, use your government card for incidentals, USAID has a block of rooms at the hotel and takes care of the bill.

Please send us your home addresses. This is the one piece of info that we did not collect yesterday that we apparently needed.

Contact Info while you are in Japan:

HQ - 301-816-5100

USAID Rep

General e-mail [RMTFACTSU\\_ELNRC@ofda.gov](mailto:RMTFACTSU_ELNRC@ofda.gov) send all e-mails to this e-mail primarily and copy the others

Days

Jason Kozal (b)(6) [jason.kozal@nrc.gov](mailto:jason.kozal@nrc.gov)

Michael Dudek (b)(6)

Nights

Jeff Kowalczyk - (b)(6) [jeff.kowalczyk@nrc.gov](mailto:jeff.kowalczyk@nrc.gov)

Chuck Teal - (b)(6) [chuck.teal@nrc.gov](mailto:chuck.teal@nrc.gov)

If unsuccessful please call the main USAID RMT line -202-712-0039

If you have any questions please feel free to call us day or night.

Have a safe trip.

The NRC USAID liaison team

---

From: Foggie, Kirk  
Sent: Tuesday, March 15, 2011 9:08 AM  
To: Dudek, Michael; Kowalczyk, Jeffrey; Kozal, Jason  
Cc: (b)(6)  
Subject: Status

Mike et al.,

We are in Heathrow airport and we are a team of 7 now. Bill Cook met us here.

Our flight is delayed an hour because of new flight patterns, but we are leaving soon.

The team does have questions about per diem and use of government cards. Can you give us clarification/guidance on how much money we will be provided in our accounts, how we should pay for the hotel bill, and if we are authorized to use our gov. cards for transactions.

Thanks.

Kirk  
Sent from Blackberry.

---

**From:** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 10:10 AM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** Chron Log  
**Attachments:** LT Log 0315 @1008.pdf; ET Chron 0315 @1007.pdf

**Categories:** FOIA

FYI

Beth

---

**From:** LIA01 Hoc  
**Sent:** Tuesday, March 15, 2011 9:51 AM  
**To:** LIA08 Hoc; LIA11 Hoc  
**Subject:** FW: Cable: JAPAN TASK FORCE SITUATION REPORT NO. 06  
**Attachments:** image001.gif  
  
**Categories:** FOIA

fyi

---

**From:** RMTFACTSU\_ELNRC [mailto:RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Tuesday, March 15, 2011 9:50 AM  
**To:** LIA01 Hoc  
**Subject:** RE: Cable: JAPAN TASK FORCE SITUATION REPORT NO. 06

Looking into it now Milt.

Jason

---

**From:** LIA01 Hoc [mailto:LIA01.Hoc@nrc.gov]  
**Sent:** Tuesday, March 15, 2011 8:38 AM  
**To:** RMTFACTSU\_ELNRC  
**Subject:** RE: Cable: JAPAN TASK FORCE SITUATION REPORT NO. 06

Mike,

Any further information on specific direction from GoJ about not drinking tap water or other safety recommendations? This is still an open item for LT.

Thanks,

Ted Smith

U) Hundreds of thousands of people are struggling to find food and water. At least 1.4 million households have gone without water, and some 1.9 million households are without electricity. (AP)

---

**From:** RMTFACTSU\_ELNRC [mailto:RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Tuesday, March 15, 2011 7:03 AM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc; LIA08 Hoc; Harrington, Holly; McIntyre, David; Burnell, Scott; Marshall, Jane  
**Subject:** Cable: JAPAN TASK FORCE SITUATION REPORT NO. 06

**Subject:** Cable: JAPAN TASK FORCE SITUATION REPORT NO. 06

**UNCLASSIFIED**  
Sensitive



(b)(5)



(b)(5)

(b)(5)

(b)(5)

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**Drafted By:** TFJP01:GJWHITMAN -- 03/14/2011; 7-6611  
**Cleared By:** S/ES-O: BJFARRIER  
**Approved By:** TFJP01:KMAHER  
**Info:**  
**XMT:** AMEMBASSY TRIPOLI  
**Attachments:** metadata.dat

---

**Action Post:** AMEMBASSY BANGKOK  
**Dissemination Rule:** DISP\_ALDAC, CONS\_ACTION, CLO, AID\_Action, CONGEN

**UNCLASSIFIED**  
Sensitive



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**From:** LIA01 Hoc  
**Sent:** Tuesday, March 15, 2011 9:15 AM  
**To:** RMTPACTSU\_ELNRC; LIA11 Hoc  
**Subject:** Based on information currently available.docx  
**Attachments:** Based on information currently available.docx  
  
**Categories:** FOIA

Mike,

We need to get this information to Christine Cutler at State.

We are crunching numbers on the SFP, but this is the best information we have right now.

Can you get this to Ms Cutler?

Thanks,

Ted

- Based on information currently available, the NRC believes the Japanese response to the reactor situations and the protective actions they are taking are comparable to how we would respond. We advise Americans in Japan to follow the guidance of Japanese officials.

---

**From:** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 9:06 AM  
**To:** Brooks, Marc; NICC  
**Cc:** Nuclear SSA  
**Subject:** RE: Situational Awareness Report - Fuel Rods Possibly Melting Inside Fukushima Nuclear Plant - Japan - 14 Mar 11

**Categories:** FOIA

I will verify with the keeper of the list that the NICC gets added as soon as possible. I apologize for the oversight, the request had been sent to them yesterday afternoon.

Beth Reed  
Federal Liaison Desk  
301-816-5208

---

**From:** Brooks, Marc [mailto:Marc.Brooks@dhs.gov]  
**Sent:** Tuesday, March 15, 2011 8:16 AM  
**To:** LIA11 Hoc; NICC  
**Cc:** Nuclear SSA  
**Subject:** RE: Situational Awareness Report - Fuel Rods Possibly Melting Inside Fukushima Nuclear Plant - Japan - 14 Mar 11

Federal Liaison Desk,

To facilitate coordination of cross-sector interdependency and potential cascading impact analyses, can we please include the National Infrastructure Coordinating Center (NICC), [NICC@hq.dhs.gov](mailto:NICC@hq.dhs.gov) on the distro list for NRC Emergency Operations Center (EOC) Earthquake/Tsunami Situational Reports (SITREPs)?

Thanks,  
Marc

Marc A. Brooks, CPP  
Chief, Nuclear Sector-Specific Agency  
Office of Infrastructure Protection  
Department of Homeland Security  
Office: (703) 603-5116  
Blackberry: (b)(6)  
[marc.brooks@dhs.gov](mailto:marc.brooks@dhs.gov)

---

**From:** prvs=0470316c4=LIA11.Hoc@nrc.gov [mailto:prvs=0470316c4=LIA11.Hoc@nrc.gov] **On Behalf Of** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 2:05 PM  
**To:** NICC  
**Cc:** Brooks, Marc  
**Subject:** RE: Situational Awareness Report - Fuel Rods Possibly Melting Inside Fukushima Nuclear Plant - Japan - 14 Mar 11

Thank you for your quick response.

---

**From:** NICC [mailto:Nicc@dhs.gov]  
**Sent:** Monday, March 14, 2011 1:53 PM  
**To:** LIA11 Hoc  
**Cc:** Brooks, Marc  
**Subject:** RE: Situational Awareness Report - Fuel Rods Possibly Melting Inside Fukushima Nuclear Plant - Japan - 14 Mar 11

Ma'am,

The NICC has received your request and is working to add you to our distribution list.

V/r,

(b)(6)

NICC Watch Operations  
Department of Homeland Security  
202-282-9201  
Email: [nicc@dhs.gov](mailto:nicc@dhs.gov)  
HSDN: [tsa.nicc@dhs.gov](mailto:tsa.nicc@dhs.gov)  
JWICS: [nicc.watch@tsa.ic.gov](mailto:nicc.watch@tsa.ic.gov)

For more information on the NICC go to:  
[DHS National Infrastructure Coordinating Center](#)

Distro List:  
NICC SWO  
NICC Support

---

**From:** prvs=0470316c4=LIA11.Hoc@nrc.gov [mailto:prvs=0470316c4=LIA11.Hoc@nrc.gov] **On Behalf Of** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 1:21 PM  
**To:** [nicc@dhs.gov](mailto:nicc@dhs.gov)  
**Subject:** Situational Awareness Report - Fuel Rods Possibly Melting Inside Fukushima Nuclear Plant - Japan - 14 Mar 11

I am from the NRC Ops Center, Federal Liaison Desk, could you please add the NRC Federal Liaison Desk to the distribution list for Situational Awareness Reports? Please use the following e-mails addresses:

[LIA01.hoc@nrc.gov](mailto:LIA01.hoc@nrc.gov)  
[LIA11.hoc@nrc.gov](mailto:LIA11.hoc@nrc.gov)

Thank you,  
Beth Reed  
NRC Federal Liaison Desk  
301-816-5208



---

**To:** Wright, Lisa (Gibney)  
**Subject:** RE: Japan Update

The shift schedule changes every day. We have two trained people (Ted Smith and me) working with 3 new people and are alternating between 12 hour shifts to 8 hour shifts. Right now this weekend looks like three 8 hour shifts, 7AM - 3PM, 3PM-11PM and 11PM-7AM.

Brian who?

---

**From:** Wright, Lisa (Gibney)  
**Sent:** Tuesday, March 15, 2011 8:17 AM  
**To:** LIA11 Hoc  
**Subject:** Re: Japan Update

Don't hesitate to contact us. We fly back on Saturday afternoon. What's the shift schedule?

Also I would really like to talk to Brian if there is a good time this morning. Can you call my personal cell at 301 448 6869 and let's talk a second

Sent from my NRC blackberry

Lisa Gibney

To reach me please call

(b)(6)

---

**From:** LIA11 Hoc  
**To:** Wright, Lisa (Gibney)  
**Sent:** Tue Mar 15 07:57:35 2011  
**Subject:** Japan Update

(b)(6)

but I was asked to contact you all and find out when you are coming back. The LT will be going throughout the weekend and possibly through next week. The NRC remains in monitoring mode, but we are fully staffed on the LT and looking for people to help. When you return are you able to support the Fed Liaison Team? Thanks!

Beth Reed  
301-816-5208

---

**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Tuesday, March 15, 2011 7:42 AM  
**To:** LIA11 Hoc  
**Subject:** RE: Follow up on KI

**Categories:** FOIA

Beth,

I'm briefing the USAID Administrator in a few minutes... and then I'll call you.

Sorry!

---

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Tuesday, March 15, 2011 7:25 AM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** Follow up on KI

I was asked to contact you guys to see if you are working on getting KI through USAID for our NRC folks heading over to Japan. Could you please get with someone and get KI together for our team and have it available over in Japan when they get over there.

Beth

---

**From:** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 7:18 AM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** RE: Chron Log

**Categories:** FOIA

Sorry you didn't get any overnight, I even put it in writing to do so but it got dropped during shift turnover.

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Tuesday, March 15, 2011 7:16 AM  
**To:** LIA11 Hoc  
**Subject:** RE: Chron Log

Thanks Beth! ☺

---

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Tuesday, March 15, 2011 7:04 AM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** Chron Log

I just got here and will be sending you the logs from over night ASAP.

Beth

---

**From:** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 7:10 AM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** RE: Status Report  
**Attachments:** SITREP 0315 @0600.docx; LT Log 0315 @0707.pdf; ET Log 0315 @0707.pdf  
  
**Categories:** FOIA

FYI

Beth

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Tuesday, March 15, 2011 5:01 AM  
**To:** LIA11 Hoc; LIA01 Hoc  
**Subject:** Status Report

Could you please forward the latest status report published to WebEOC? Thanks.

---

**From:** Hall, David <David.Hall2@dhs.gov> on behalf of NOC.NDD <NOC.Ndd@dhs.gov>  
**Sent:** Tuesday, March 15, 2011 3:49 AM  
**To:** prvs=048e943f1=LIA11.Hoc@nrc.gov  
**Cc:** NOC.NDD; NOC.SWO.Restricted  
**Subject:** FW: Status Update  
**Attachments:** March 14 2200 hours.docx

**Categories:** FOIA

Jeff – thanks. We received this particular report last evening and as your caution at the top of the page states. . .it is a little dated.

Therefore, I will use the DOS conference call to confirm the DHS Secretary's questions about a 3<sup>rd</sup> explosion (i.e., unit 2) and a fire (i.e., unit/bldg 4). If you get a more current update that you can release . . .we would appreciate being included on distribution. Thanks again . . .

Dave

David Hall  
NOC Duty Director  
Operations Coordination Division  
Department of Homeland Security  
(UNCLASS) 202-282-8101/202-447-4404/7  
(SECRET) 202-282-8100  
(BB) (b)(6)  
(UNCLASS) [david.hall@hq.dhs.gov](mailto:david.hall@hq.dhs.gov)  
(HSDN) [david.hall@dhs.gov](mailto:david.hall@dhs.gov)  
(JWICS) [dbhall@DHS.ic.gov](mailto:dbhall@DHS.ic.gov)

---

**From:** prvs=048e943f1=LIA11.Hoc@nrc.gov [mailto:prvs=048e943f1=LIA11.Hoc@nrc.gov] **On Behalf Of** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 3:24 AM  
**To:** noc.ndd@hq.dhs.gov  
**Subject:** Status Update

Dave:

See attached.

Jeff Lynch  
301-816-5208

---

**From:** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 3:20 AM  
**To:** (b)(6)  
**Subject:** NRC Emergency Operations Status Update  
**Attachments:** March 14 2200 hours.docx  
  
**Categories:** FOIA

See attached. Unfortunately we do not have a website to sign up to. These updates are on our WebEOC, which I believe may be an internal website.

---

**From:** LIA11 Hoc  
**Sent:** Tuesday, March 15, 2011 2:45 AM  
**To:** Hoc, PMT12  
**Subject:** 7th Fleet Contact Information

**Categories:** FOIA

7<sup>th</sup> Fleet can be contacted through the DTRA watch officer @ 703-767-2000. They will patch you over to the 7<sup>th</sup> Fleet.

You could possibly talk to the 7<sup>th</sup> fleet and they might be able to break down the non-confidential info.

---

**From:** LIA02 Hoc  
**Sent:** Monday, March 14, 2011 11:49 PM  
**To:** RMTPACTSU\_ELNRC; LIA11 Hoc; LIA01 Hoc; LIA07 Hoc  
**Subject:** RE: Verification of country clearances

**Categories:** FOIA

It is my understanding the Jack Ramsey spoke to USAID and they had all the information they needed for country clearances. I'm just making sure you don't need anything else from us on this. Can you please confirm?

Thanks

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Monday, March 14, 2011 7:34 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc  
**Subject:** Verification of country clearances

Please verify that OIP has processes the country clearances for NRC employees traveling to Japan.

Jason



---

**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 11:12 PM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** FW: Equipment List requested  
**Attachments:** FW: Contingency Action from GEH

**Categories:** FOIA

---

**From:** LIA06 Hoc  
**Sent:** Monday, March 14, 2011 11:01 PM  
**To:** [redacted] (b)(6)  
**Cc:** Trapp, James; LIA11 Hoc; RST01 Hoc; Ulses, Anthony  
**Subject:** Equipment List requested

Jim – Here's is the equipment list updated with specs.  
This is Tom Blount as the LT Director – Pls confirm receipt.  
Thanks,  
Tom

---

**From:** [redacted] (b)(6) [mailto:[redacted] (b)(6)]  
**Sent:** Monday, March 14, 2011 6:10 PM  
**To:** LIA06 Hoc  
**Subject:** Re: Neutron Absorbers - Millenitek

Can you email me the list of potential assets needed at Fukushima put together by the NRC to my nrc email account. Thanks

Sent from my Verizon Wireless BlackBerry

---

**From:** LIA06 Hoc <LIA06.Hoc@nrc.gov>  
**Date:** Mon, 14 Mar 2011 17:59:18 -0400  
**To:** [redacted] (b)(6)  
**Subject:** RE: Neutron Absorbers - Millenitek

We do have the same info. This was briefed by the RST to the ET and the Chairman recently. I do not know the "source" (of the information) yet, but I will try to find out. Tim

---

**From:** [redacted] (b)(6) [mailto:[redacted] (b)(6)]  
**Sent:** Monday, March 14, 2011 4:41 PM  
**To:** LIA06 Hoc  
**Subject:** Re: Neutron Absorbers - Millenitek

Need your help - there is an email in RI the says cooling restored to all 3 reactors. Could you confirm the source and do you have the same info - I am having trouble contacting Japanese counterparts. Thanks much!

Sent from my Verizon Wireless BlackBerry

---

**From:** LIA06 Hoc <LIA06.Hoc@nrc.gov>  
**Date:** Mon, 14 Mar 2011 16:37:01 -0400  
**To:** [REDACTED] (b)(6)  
**Cc:** LIA02 Hoc<LIA02.Hoc@nrc.gov>; RST01 Hoc<RST01.Hoc@nrc.gov>  
**Subject:** RE: Neutron Absorbers - Millenitek

Jim – Hi, Tim McGinty. LT Director for the next 8 hours.

Regarding your Mark I Containment question, the RST is working it and I checked 10 minutes ago, ... I think we are getting close to a response.

[REDACTED] (b)(5)

---

**From:** LIA02 Hoc  
**Sent:** Monday, March 14, 2011 4:08 PM  
**To:** LIA06 Hoc  
**Subject:** FW: Neutron Absorbers - Millenitek  
**Importance:** High

---

**From:** [REDACTED] (b)(6) [mailto:[REDACTED] (b)(6)]  
**Sent:** Monday, March 14, 2011 3:55 PM  
**To:** LIA02 Hoc  
**Cc:** Ronald C Cherry  
**Subject:** Fw: Neutron Absorbers - Millenitek  
**Importance:** High

Please evaluate and determine if this material may be of assistance. Thank you!

Sent from my Verizon Wireless BlackBerry

---

**From:** "Cherry, Ronald C" <CherryRC@state.gov>  
**Date:** Tue, 15 Mar 2011 04:42:43 +0900  
**To:** [REDACTED] (b)(6); Duncan, Aleshia<Aleshia.Duncan@nuclear.energy.gov>; Duncan, Aleshia D<DuncanAD@state.gov>  
**Subject:** FW: Neutron Absorbers - Millenitek

Jim, would something like this help?

This email is UNCLASSIFIED.

---

**From:** Hammitt, Brad [mailto:Brad.Hammitt@nnsa.doe.gov]  
**Sent:** Tuesday, March 15, 2011 4:41 AM  
**To:** NITOPS  
**Cc:** Cherry, Ronald C; Daschbach, Michael A; 'Robert.Leach@trade.gov'; 'John.Peters@trade.gov'; 'Greg.Loose@trade.gov'; 'steve.getley@millennitek.com'; 'eric.youngquist@millennitek.com'; 'shart@knoxvillechamber.com'; 'Alain.DeSarran@trade.gov'; Kilmartin, William  
**Subject:** FW: Neutron Absorbers - Millenitek  
**Importance:** High

Below is an offer to donate 20,000 boron carbide neutron absorbers from a company called, "Millennitek." This is being made through the Knoxville U.S. Export Assistance Center.

-Brad  
Country Manager  
Office of Second Line of Defense  
National Nuclear Security Administration  
Tel: (202) 586-8396

---

**From:** Robert Leach [mailto:Robert.Leach@trade.gov]  
**Sent:** Monday, March 14, 2011 3:24 PM  
**To:** John Peters; Greg Loose; Hammitt, Brad; Cherry, Ron; steve.getley@millennitek.com; eric.youngquist@millennitek.com  
**Cc:** Sam Hart; Alain DeSarran  
**Subject:** Neutron Absorbers - Millenitek  
**Importance:** High

John and Greg, Ron and Brad,

Millennitek, a manufacturer of advanced ceramic materials, initiated contact with me and has asked for our help to facilitate a donation of 15 barrels of approximately 20,000 Boron Carbide Neutron Absorbers. These absorbers can be dropped into the damaged reactor and will slow down the nuclear reaction to buy time for the Japan government.

Would you help us with this donation? We want to help the Japanese people to be safe from harm.

I've copied the President of Millennitek on this e-mail, Mr. Steve Getley, his co-worker Eric Youngquist and a co-worker of mine Sam Hart of the Knoxville Chamber of Commerce. I've also taken the liberty to address the two gentlemen from DOE whom Greg recently introduced and Alain DeSarran who would be aware of how the crisis has effected your staff in Japan.

Best regards, Rob Leach

---

Robert Leach, Director  
Knoxville U.S. Export Assistance Center  
U.S. Commercial Service  
U.S. Department of Commerce  
17 Market Square, #201  
Knoxville, TN 37902-1405  
Tel: (865) 545-4637  
Fax: (865) 545-4435  
www.export.gov

[www.buyusa.gov/tennessee](http://www.buyusa.gov/tennessee)

My e-mail address has changed to [robert.leach@trade.gov](mailto:robert.leach@trade.gov).

---

**From:** Batkin, Joshua  
**Sent:** Monday, March 14, 2011 9:15 PM  
**To:** 'RMTPACTSU\_ELNRC@ofda.gov'; LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc  
**Cc:** Marshall, Jane; Gott, William; Grant, Jeffery; McDermott, Brian  
**Subject:** Re: Travel of NRC Team to Japan

**Categories:** FOIA

Excellent. Thank you.

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

---

**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc  
**Cc:** Marshall, Jane; Gott, William; Grant, Jeffery; McDermott, Brian; Batkin, Joshua  
**Sent:** Mon Mar 14 19:36:13 2011  
**Subject:** Travel of NRC Team to Japan

The rest...Chuck Casto is verified on the plane.

---

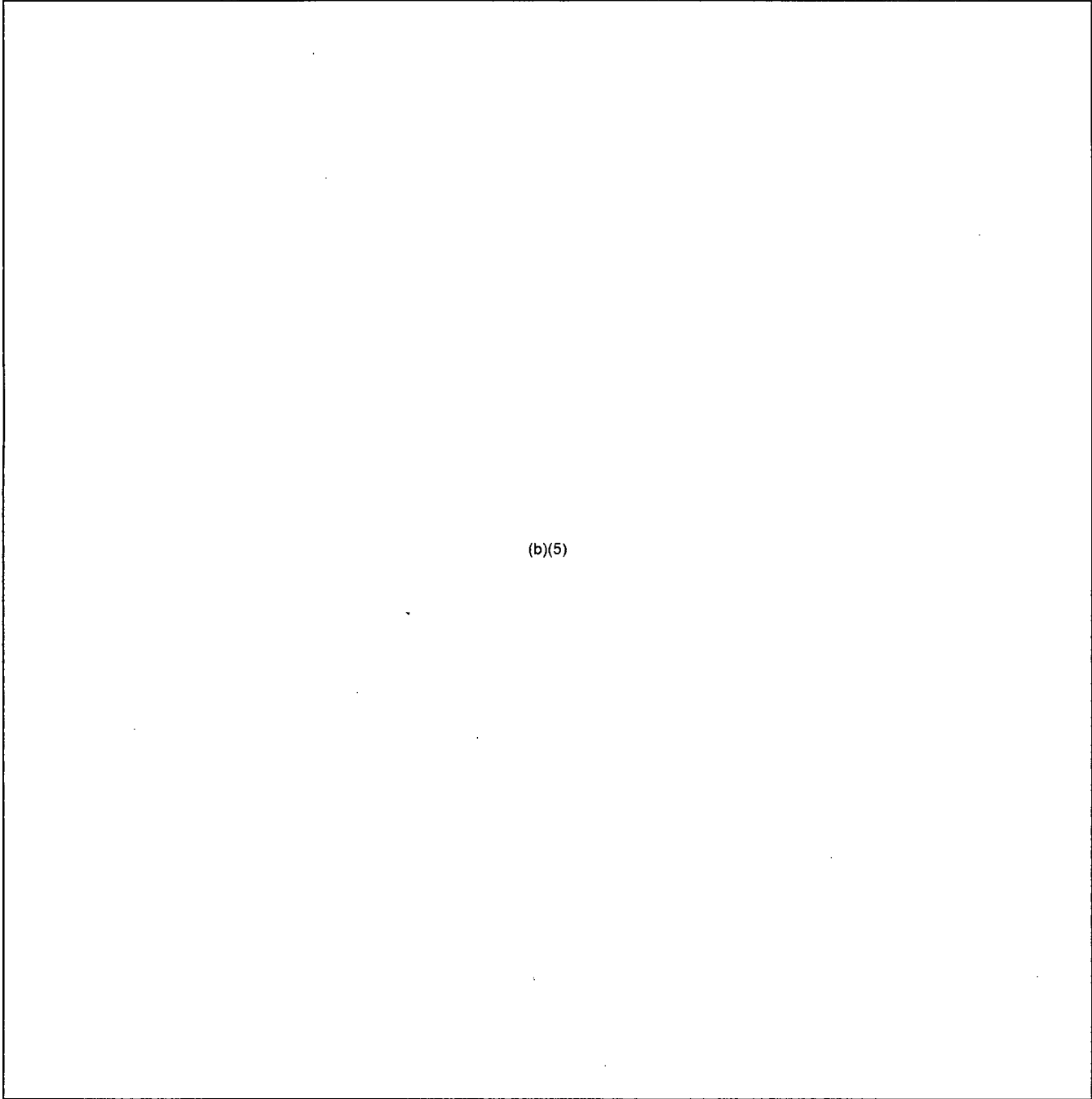
**From:** RST01 Hoc  
**Sent:** Monday, March 14, 2011 8:59 PM  
**To:** taskforce-1@state.gov  
**Cc:** LIA11 Hoc; RST01 Hoc  
**Subject:** Severe Accident R2.docx  
**Attachments:** Severe Accident R2.docx  
  
**Categories:** FOIA

Per your request, please let me know if this is what you were looking for and if you have questions please contact the NRC Operations Center at (301) 816-5100 and ask for either the Liaison Team (LT) or the Reactor Safety Team (RST).

20:25 EDT  
3/14/2011

**DRAFT**

**Severe Accident Consequences**



(b)(5)

—Official Use Only—

(b)(5)

—Official Use Only—



~~Official Use Only~~

(b)(5)

Official Use Only

---

**From:** RST01 Hoc  
**Sent:** Monday, March 14, 2011 8:37 PM  
**To:** (b)(6)  
**Cc:** LIA11 Hoc; RST01 Hoc  
**Subject:** Severe Accident Progression  
**Attachments:** Severe Accident R2.docx  
  
**Categories:** FOIA

Attached is a postulated series of Severe Accident Consequences.

If you have any questions please call the NRC Operations Center at (301) 816-5100 and ask for the Reactor Safety Team.

20:25 EDT  
3/14/2011

**DRAFT**

**Severe Accident Consequences**

(b)(5)

(b)(5)

(b)(5)

---

**From:** Smith, Theodore  
**Sent:** Monday, March 14, 2011 8:33 PM  
**To:** LIA11 Hoc; LIA01 Hoc  
**Subject:** Re: Status?

**Categories:** FOIA

Hi all.

Just checking who is on for tonight and tomorrow--figure I have a shift coming up sometime.

Ted Smith

---

**From:** LIA11 Hoc  
**To:** Smith, Theodore  
**Sent:** Mon Mar 14 12:22:10 2011  
**Subject:** RE: Status?

Well at least it makes the day go by fast.

---

**From:** Smith, Theodore  
**Sent:** Monday, March 14, 2011 12:19 PM  
**To:** LIA11 Hoc  
**Subject:** RE: Status?

Sorry you have been overwhelmed

---

**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 12:18 PM  
**To:** Smith, Theodore  
**Subject:** RE: Status?

Hi Ted, it's been crazy. We are still trying to get names to send over there, looks like 8 now. I pulled in a co-worker and trained him up quickly to help me so things are manageable.

Beth

---

**From:** Smith, Theodore  
**Sent:** Monday, March 14, 2011 12:15 PM  
**To:** LIA11 Hoc  
**Subject:** Status?

Beth,

Just woke up and wanted to check and see if there was any news?

Ted Smith

---

**From:** RST01 Hoc  
**Sent:** Monday, March 14, 2011 8:32 PM  
**To:** LIA11 Hoc  
**Subject:** RE: Severe Accident R1.docx

**Categories:** FOIA

My number here is 301-816-5504.

---

**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 7:48 PM  
**To:** RST01 Hoc  
**Subject:** RE: Severe Accident R1.docx

Page one edits:

(b)(5)

Page two edits:

(b)(5)

Jeff

---

**From:** RST01 Hoc  
**Sent:** Monday, March 14, 2011 7:32 PM  
**To:** LIA11 Hoc  
**Subject:** FW: Severe Accident R1.docx

The doc I was talking about.

---

**From:** RST01 Hoc  
**Sent:** Monday, March 14, 2011 6:28 PM  
**To:** LIA01 Hoc  
**Subject:** Severe Accident R1.docx

(b)(5)

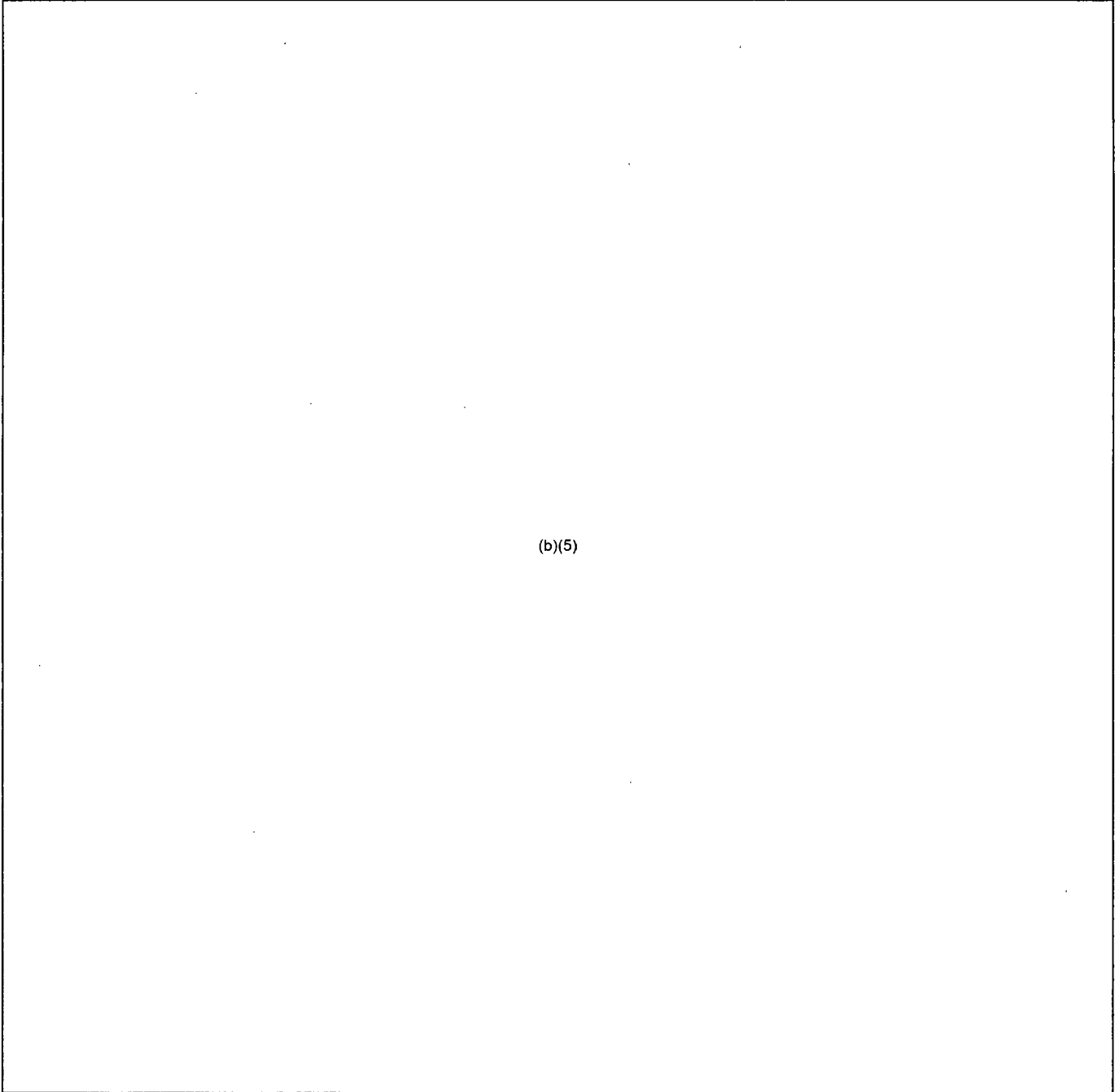
Thank you,  
Rollie



20:20 EDT  
3/14/2011

**DRAFT**

**Severe Accident Consequences**



(b)(5)

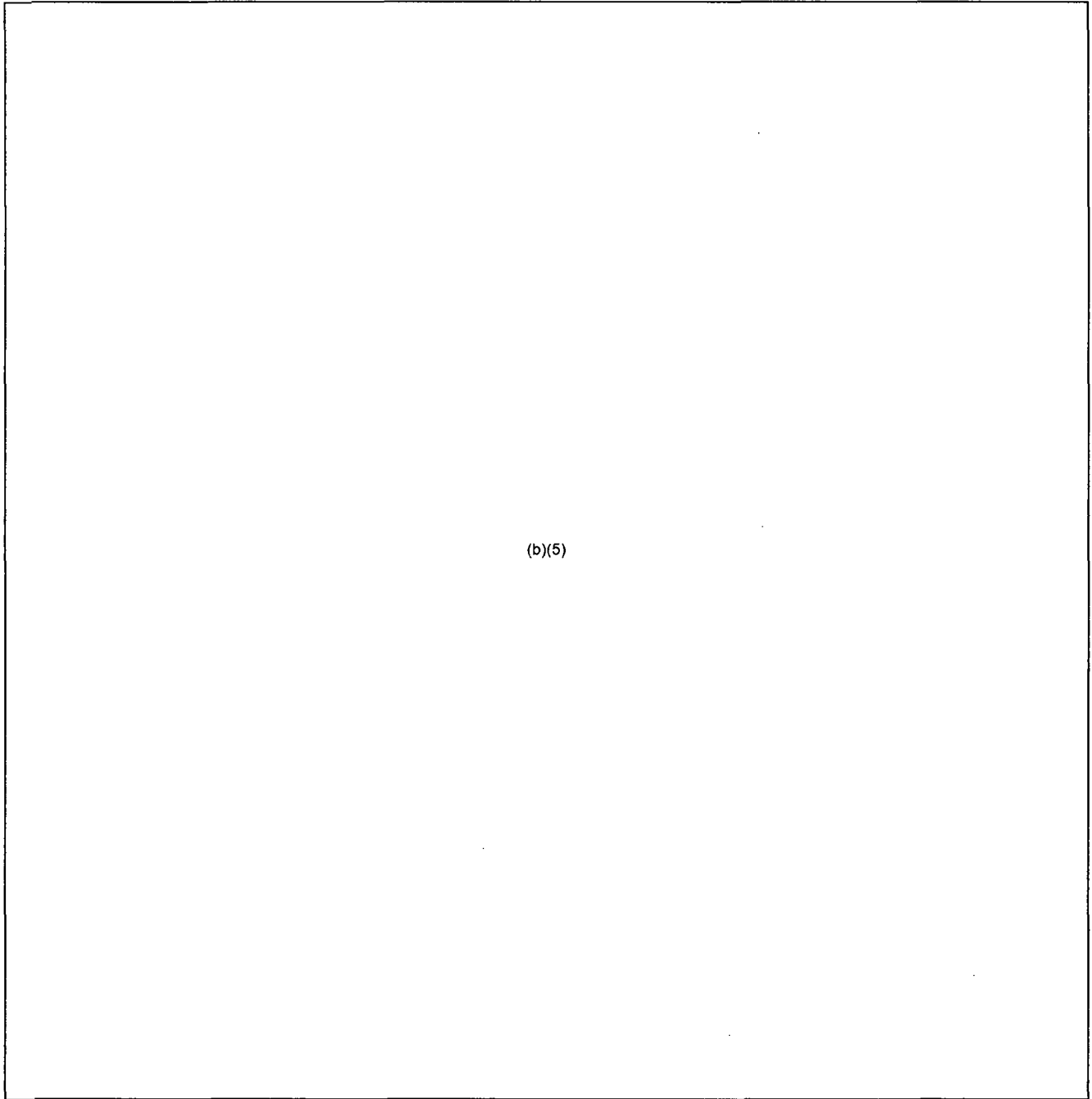
(b)(5)

(b)(5)

18:27 EDT  
3/14/2011

**DRAFT**

**Severe Accident Consequences**



(b)(5)

(b)(5)

(b)(5)

---

**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Monday, March 14, 2011 7:31 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc  
**Cc:** Marshall, Jane; Gott, William; Grant, Jeffery; McDermott, Brian; Batkin, Joshua  
**Subject:** Travel of NRC team to Japan  
**Attachments:** FW: eInvoice, March 14 for FOGGIE; FW: eInvoice, March 14 for SMITH; FW: eInvoice, March 14 for NAKANISHI; FW: eInvoice, March 14 for MONNINGER; FW: eInvoice, March 14 for FOSTER; FW: Travel Reservation March 14 for COOK; Travel Reservation March 14 for CASTO

**Categories:** FOIA

More to come...please propagate ..we will put together a tracking list soon.

Jason

---

**From:** Kozal, Jason  
**Sent:** Monday, March 14, 2011 5:38 PM  
**To:** LIA11 Hoc  
**Subject:** Urgent: call in info for fire chiefs

**Categories:** FOIA

Please get this to Vince Holahan Asap

18883634749

Or

2154463662

Access code

Sent from an NRC BlackBerry

Jason W Kozal



---

**From:** RMTFACTSU\_ELNRC <RMTFACTSU\_ELNRC@ofda.gov>  
**Sent:** Monday, March 14, 2011 4:55 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA08 Hoc; Gott, William; Marshall, Jane; Grant, Jeffery  
**Subject:** FW: NRC visas and passports  
**Categories:** FOIA

FYI

---

**From:** Dresser, Heather L (EAP/J) [mailto:DresserHL@state.gov]  
**Sent:** Monday, March 14, 2011 4:50 PM  
**To:** RMTFACTSU\_STATE; RMT\_FACTSU  
**Cc:** EAP-J-Office-DL; Task Force 1; SES-O\_Shift-II; SES-O\_Shift-III  
**Subject:** RE: NRC visas and passports

Dear Donny,

Following up on the country clearance side: Tokyo will expedite approval of their eCCs, and requests that OFDA submit them via the usual, web-based system: <http://ecc.state.gov>.

In case you're not familiar with the eCC system, submitting an ECC requires a full set of travel details – name, passport info, DOB, flight info, emergency contact (eg spouse etc), office info, etc. We can fudge some of it, but will need the bare bones.

I believe the system usually requires a login if you're not on an OpenNet computer. If you guys can't get in, give me a call at 202-647-4459 and I'll do the data entry from here, on the phone with you (or your designee). If it's late and you fear I've headed home for the day, call me on (b)(6) – I can FOB in from there to the same effect.

Thanks,  
Heather

This email is UNCLASSIFIED.

---

**From:** Green, Christopher L  
**Sent:** Monday, March 14, 2011 4:19 PM  
**To:** 'RMTFACTSU\_STATE@ofda.gov'; Yoo, Donny H  
**Cc:** EAP-J-Office-DL  
**Subject:** FW: NRC visas and passports

Donny,

Yes, need visas, we can do same day but need below info ASAP!

Regards,  
Christopher

The desk can put together visa expedite request letters to accompany the visa applications and passports of the NRC team.

The following information is needed for us to put together the letters:

**Alexander T. Hamilton**

**DPOB: 11 JAN 1757 Virginia, USA**

**Passport# 9100xxxxx**

**Issued 27 Apr 2009**

**Expires 26 Apr 2014**

**Issued in Washington DC by Dept of State**

SBU

This email is UNCLASSIFIED.

---

**From:** Dresser, Heather L (EAP/J)  
**Sent:** Monday, March 14, 2011 4:12 PM  
**To:** EAP-J-Office-DL  
**Subject:** RE: NRC visas and passports

Confirmed. Visas are EAP/J action, country clearance is TF-1 action.  
Heather

This email is UNCLASSIFIED.

---

**From:** Dresser, Heather L (EAP/J)  
**Sent:** Monday, March 14, 2011 4:09 PM  
**To:** Campbell, Todd A; Green, Christopher L; EAP-J-Office-DL  
**Subject:** RE: NRC visas and passports

Country clearance should be handled by the TF. They've seen this request, and I just called up to make sure they've acted on it. Dan (deputy coord. right now) is calling me back.  
Heather

This email is UNCLASSIFIED.

---

**From:** Campbell, Todd A  
**Sent:** Monday, March 14, 2011 4:07 PM  
**To:** Green, Christopher L; EAP-J-Office-DL  
**Subject:** RE: NRC visas and passports

Chris the team members do need visas.

The Embassy of Japan is willing to approve/print the visas same day.

The desk can put together visa expedite request letters to accompany the visa applications and passports of the NRC team.

The following information is needed for us to put together the letters:

**Alexander T. Hamilton**

**DPOB: 11 JAN 1757 Virginia, USA**

**Passport# 9100xxxxx**

**Issued 27 Apr 2009**

**Expires 26 Apr 2014**

**Issued in Washington DC by Dept of State**

\*\*\*I am unclear on the clearance process for post as there was mention this morning that Ambassador Roos needs to approve any/all official travel to Japan going forward\*\*\*

This email is UNCLASSIFIED.

---

**From:** Green, Christopher L  
**Sent:** Monday, March 14, 2011 3:26 PM  
**To:** EAP-J-Office-DL  
**Subject:** FW: NRC visas and passports

Visas for NRC officials?

This email is UNCLASSIFIED.

---

**From:** RMTFACTSU\_STATE [mailto:]  
**Sent:** Monday, March 14, 2011 3:23 PM  
**To:** Green, Christopher L

**Cc:** TaskForce-1; RMT\_PACTSU; SES-O\_Shift-II; SES-O\_Shift-III

**Subject:** NRC visas and passports

Chris,

Per our telcon, I wanted to ask you a couple of questions regarding passports and visas for the NRC team of 6 due to leave imminently. The USAID RMT team has a few questions for you:

- 1) Five NRC officials only have personal passports. There is also one NRC person who only has an official passport (not/not a diplomatic passport, and no personal passport). Will there be any issue if they travel on these passports?
- 2) We've heard that no visas are required for those traveling on humanitarian assistance. Could you confirm that this is in fact the case, and that this would apply to the 6 NRC officials who are to depart shortly?
- 3) If visas are needed, would you be able to expedite the visas with the Japanese embassy? If not, is there any paperwork they would need to expedite their entry into Japan at the port of entry?
- 4) Do these NRC officials need to send a country clearance cable? Does NRC send it directly to post?
- 5) Do they need travel orders even though they are from a different agency?

Please reply-all with your answers.

Thanks,  
Donny

---

**From:** Simonson, Gregory F Mr OSD ATL <(b)(6)>  
**Sent:** Monday, March 14, 2011 3:40 PM  
**To:** LIA11 Hoc  
**Subject:** RE: NRC SITREPS

**Categories:** FOIA

Thanks again. These are just what I was looking for. Glad to be on distro for future messages too!

Vr,  
Greg

-----Original Message-----

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Monday, March 14, 2011 2:15 PM  
**To:** Simonson, Gregory F Mr OSD ATL  
**Subject:** NRC SITREPS

Greg please see attached. All the names you have requested to be added to the distro list has been added.

---

**From:** LIA08 Hoc  
**Sent:** Monday, March 14, 2011 3:13 PM  
**To:** RMTPACTSU\_ELNRC; LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc  
**Subject:** RE: Passport names

**Categories:** FOIA

Charlotte is LIA02... she should get this.  
Rani

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Monday, March 14, 2011 3:10 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA08 Hoc; LIA02 Hoc  
**Subject:** Passport names

Please pass the names and type of passports for the 9 individuals ASAP – If one of the addresses is not charlotte please forward it to her at the International Liaison desk.

---

**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 3:13 PM  
**To:** LIA07 Hoc  
**Subject:** FW: SITREP

**Categories:** FOIA

Please add [RMTPACTSU\\_ELNRC@ofda.gov](mailto:RMTPACTSU_ELNRC@ofda.gov) to the distro list. They are NRC folks at the USAID. Thanks

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Monday, March 14, 2011 2:57 PM  
**To:** LIA11 Hoc  
**Subject:** SITREP

Do we have an updated sitrep...haven't seen one since this morning

---

**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 2:31 PM  
**To:** RMTPACTSU\_ELNRC  
**Cc:** (b)(6); Kozal, Jason  
**Subject:** Chron Log  
**Attachments:** ET Chron 0314 @1422.pdf

Attached is the latest ET Chron log. I would send you the LT log but it has not been updated since 0600 this morning so you already have that log.

Beth



---

**From:** Anderson, Joseph  
**Sent:** Monday, March 14, 2011 2:16 PM  
**To:** LIA11 Hoc  
**Subject:** FW: WNN Daily: Loss of coolant at Fukushima Daiichi 2

---

**From:** Quinn, Vanessa [mailto:Vanessa.Quinn@dhs.gov]  
**Sent:** Monday, March 14, 2011 2:09 PM  
**To:** Brooks, Marc; Anderson, Joseph; Wright, Lisa (Gibney)  
**Subject:** FW: WNN Daily: Loss of coolant at Fukushima Daiichi 2

fyi

---

**From:** World Nuclear News [mailto:wnn=world-nuclear-news.org@mcsv82.net] **On Behalf Of** World Nuclear News  
**Sent:** Monday, March 14, 2011 2:00 PM  
**To:** Quinn, Vanessa  
**Subject:** WNN Daily: Loss of coolant at Fukushima Daiichi 2

[View the WNN Daily in your browser.](#)



*To ease heavy website congestion, all these stories are available on WNN's Facebook page in the Notes section*

#### **14 March 2011**

REGULATION & SAFETY: Loss of coolant at Fukushima Daiichi 2  
Serious damage to the reactor core of Fukushima Daiichi 2 seems likely after all coolant was lost for a period.

REGULATION & SAFETY: Explosion rocks third Fukushima reactor  
Another hydrogen explosion has rocked the Fukushima Daiichi nuclear power plant, this time at the third reactor unit. Analysis shows the containment structure remains intact.

REGULATION & SAFETY: Cold shutdowns at Fukushima Daiichi  
Two more reactors at Fukushima Daiichi have now achieved cold shutdown with full operation of cooling systems. Engineers are working for the same at the last unit.

REGULATION & SAFETY: Rolling blackouts as Japanese efforts continue  
Japanese utilities are introducing rolling blackouts in the face of energy shortages following the natural disasters of the last few days. Meanwhile, the country is relying more than ever on the continued operation of its other nuclear reactors.

#### **13 March 2011**

**REGULATION & SAFETY:** Efforts to manage Fukushima Daiichi 3  
Operations to relieve pressure in the containment of Fukushima Daiichi 3 have taken place after the failure of a core coolant system. Seawater is being injected to make certain of core cooling. Malfunctions have hampered efforts but there are strong indications of stability.

**REGULATION & SAFETY:** Contamination check on evacuated residents  
Potential contamination of the public is being studied by Japanese authorities as over 170,000 residents are evacuated from within 20 kilometres of Fukushima Daini and Daiichi nuclear power plants. Nine people's results have shown some degree of contamination.

### **12 March 2011**

**REGULATION & SAFETY:** Battle to stabilise earthquake reactors  
Attention remains focused on the Fukushima Daiichi and Daini nuclear power plants as Japan struggles to cope in the aftermath of its worst earthquake in recorded history. A dramatic explosion did not damage containment and sea water injection continues through the night.

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World Nuclear Association  
Carlton House, 22a St James's Square  
London, Westminster SW1Y4JH

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---

**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 1:51 PM  
**To:** LIA07 Hoc  
**Subject:** FW: Distro List

**Categories:** FOIA

Please add the below people to the distro list for SITREPS.

-----Original Message-----

**From:** McMichael, Lukas C CIV SEA 08 NR [mailto:(b)(6)]  
**Sent:** Monday, March 14, 2011 1:48 PM  
**To:** LIA11 Hoc  
**Subject:** RE: Distro List

Beth, please add:

(b)(6)

Thank you very much.

-Lukas McMichael  
Naval Reactors

-----Original Message-----

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Monday, March 14, 2011 1:38 PM  
**To:** McMichael, Lukas C CIV SEA 08 NR  
**Subject:** Distro List

Please send e-mail information for those wishing to be added to distribution list of the NRC SITREPS. Thank you.

Beth Reed

NRC Federal Liaison Desk

301-816-5208

---

**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 1:12 PM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** RE: Situational Awareness Report - Fuel Rods Possibly Melting Inside Fukushima Nuclear Plant - Japan - 14 Mar 11

**Categories:** FOIA

Funny, I reached out to them and am sending them info, but I guess they can't return the favor. I will contact them and ask if we can be added. Thanks for sending this to us.

Beth

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Monday, March 14, 2011 1:06 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA08 Hoc; Burnell, Scott; McIntyre, David; Harrington, Holly; Marshall, Jane  
**Subject:** Situational Awareness Report - Fuel Rods Possibly Melting Inside Fukushima Nuclear Plant - Japan - 14 Mar 11

**Subject:** FW: Situational Awareness Report - Fuel Rods Possibly Melting Inside Fukushima Nuclear Plant - Japan - 14 Mar 11

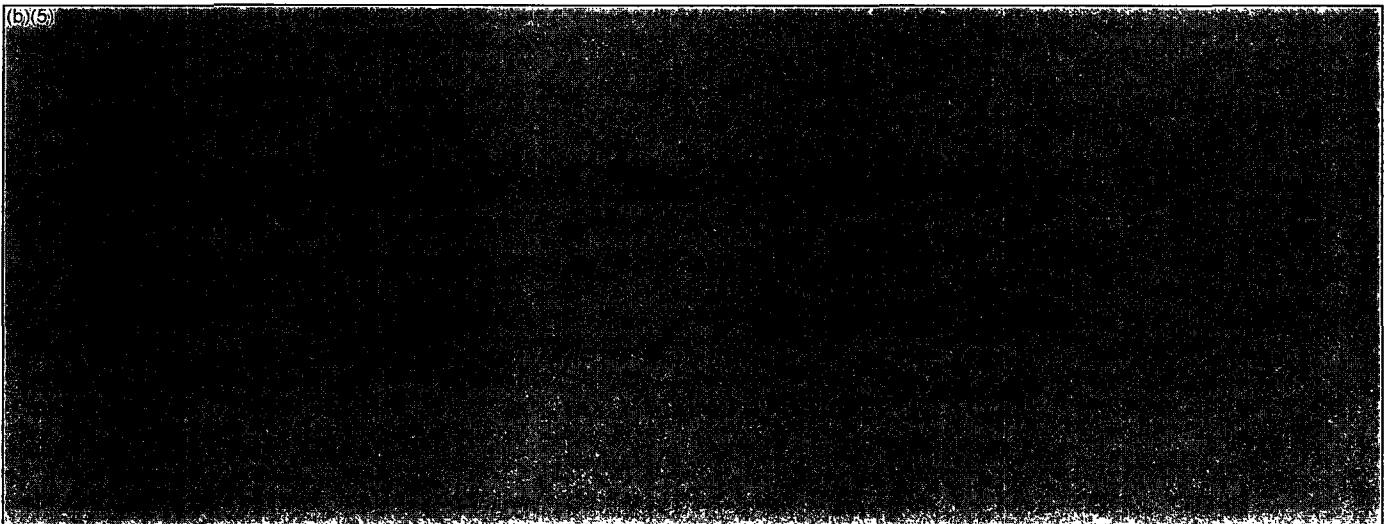
FYI, friend over at DHS just forwarded to me. Am sure you're on these chains but wanted to send along just in case.

---

**From:** NICC [mailto:Nicc@dhs.gov]  
**Sent:** Monday, March 14, 2011 12:55 PM  
**To:** undisclosed-recipients <undisclosed-recipients;>  
**Subject:** Situational Awareness Report - Fuel Rods Possibly Melting Inside Fukushima Nuclear Plant - Japan - 14 Mar 11

All,

For your situational awareness:



If you have any questions or concerns, please feel free to contact the NICC at 202-282-9201 or [NICC@dhs.gov](mailto:NICC@dhs.gov). Thank you.

V/r,

(b)(6)

NICC Watch Operations  
Department of Homeland Security  
202-282-9201  
Email: [nicc@dhs.gov](mailto:nicc@dhs.gov)  
HSDN: [tsa.nicc@dhs.sgov.gov](mailto:tsa.nicc@dhs.sgov.gov)  
JWICS: [nicc.watch@tsa.ic.gov](mailto:nicc.watch@tsa.ic.gov)

For more information on the NICC go to:  
[DHS National Infrastructure Coordinating Center](#)

Distro List:  
Situational Awareness Base List  
NICC SWO  
NICC Support  
NICC Directors  
NOC IPNICC

---

**From:** LIA08 Hoc  
**Sent:** Monday, March 14, 2011 12:19 PM  
**To:** LIA07 Hoc  
**Cc:** RMTPACTSU\_ELNRC; LIA11 Hoc; LIA01 Hoc; Harrington, Holly; McIntyre, David  
**Subject:** RE: New SITREP & Talking Points?

Yen, is this something you are working on?

Thanks,  
Rani

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Monday, March 14, 2011 11:30 AM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA08 Hoc; Harrington, Holly; McIntyre, David  
**Subject:** New SITREP & Talking Points?

Do we have a new SITREP or Talking Points that I can share with Department of State and the Interagency?

Thanks,  
Michael I. Dudek

---

**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 12:19 PM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** RE: LT and ET Chronologies  
**Attachments:** ET Chron 0313 @ 1215.pdf

**Categories:** FOIA

FYI

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Monday, March 14, 2011 11:29 AM  
**To:** LIA11 Hoc  
**Subject:** LT and ET Chronologies

Folks,

Could we get the current LT and ET chronologies for our awareness of NRC response. For the ET you might have to get Karen Jackson or Omar Khan to help.

Best

---

**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Monday, March 14, 2011 11:31 AM  
**To:** LIA11 Hoc  
**Cc:** [REDACTED] (b)(6); Kozal, Jason; Marshall, Jane; Gott, William; Grant, Jeffery  
**Subject:** RE: List of Equipment  
  
**Categories:** FOIA

We have passed this to the appropriate USAID folks and they will start working on the procurement of the items. We may need help from someone to determine quantities and spec. Will inform when we know.

---

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Monday, March 14, 2011 11:05 AM  
**To:** RMTPACTSU\_ELNRC  
**Cc:** [REDACTED] (b)(6); Kozal, Jason  
**Subject:** List of Equipment

Attached is a list of equipment needs that were discussed this morning. Please call RST if you have questions.

Beth Reed



## NRC Reactor Safety Team Equipment List

Fire trucks or Fire boats to supply makeup to suction pool and water to supply reactor (requires qualified personnel)

- portable generators (ensure appropriate voltage/frequency)
- Dewatering pumps (need qualified person to operate)
- Portable hoses and fittings
- Fire fighting gear
- Fuel for all diesel and gas equipment

Onsite Water Supply:

- Water in liquid Rad Waste tanks
- Condensate Storage Tanks
- Extend hoses into the ocean and either pump directly or pump to pond

Other Equipment:

- Positive Displacement Pumps from supply store
- Any pump capable of supplying 250 gpm at 90 pounds of pressure per reactor unit
- Battery Cells
- Battery chargers
- Air compressors
- Nitrogen bottles
- Firefighting containers carried by helicopters
- Portable switchgear for onsite pumps

Injection implementation:

- Feed through feedwater header using hoses thru removable spool piece, or
- Feed trough core spray or Standby Liquid control, or Control Rod Drive
- Injection tie-in through existing RHRSW-RHR injection lines
- Suction source from either pool or ocean

Long term cooling:

- Long term cooling for RHR – portable cooling unit and truck in and if power supply 15 tonnage and tie into cooling system, they are air cooled
- SFP requires cooling or water addition

---

**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 11:20 AM  
**To:** Liang, Rachel  
**Subject:** RE: NRC Documents

**Categories:** FOIA

There are no other federal agencies here at the NRC Ops center.

---

**From:** Liang, Rachel [mailto:Rachel.Liang@dhs.gov]  
**Sent:** Monday, March 14, 2011 11:12 AM  
**To:** LIA11 Hoc  
**Cc:** Reed, Elizabeth  
**Subject:** RE: NRC Documents

Thanks! Quick question- have any other Federal agencies deployed to the NRC operations center?

Rachel

---

**From:** prvs=0470316c4=LIA11.Hoc@nrc.gov [mailto:prvs=0470316c4=LIA11.Hoc@nrc.gov] **On Behalf Of** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 10:12 AM  
**To:** Liang, Rachel  
**Subject:** RE: NRC Documents

Glad you received it. Glad it will be helpful, just trying to be a good partner.

Beth

---

**From:** Liang, Rachel [mailto:Rachel.Liang@dhs.gov]  
**Sent:** Monday, March 14, 2011 10:10 AM  
**To:** LIA11 Hoc  
**Subject:** RE: NRC Documents

Beth,

Thanks for sending this over! We received it just fine. Thanks also for adding the Nuclear SSA to the distribution list. It is extremely helpful.

Rachel

---

**From:** prvs=0470316c4=LIA11.Hoc@nrc.gov [mailto:prvs=0470316c4=LIA11.Hoc@nrc.gov] **On Behalf Of** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 9:04 AM  
**To:** Nuclear SSA  
**Subject:** NRC Documents

Nuclear SSA,

Please see attached documents for the most current information the NRC has on the Japan incident. The SITREP is for distribution to the federal partners only, but you can use information from the SITREP to develop other communications.

Please contact us if you need any more information.

Beth Reed  
NRC Federal Liaison Desk  
301-816-5208



# NRC NEWS

## U.S. NUCLEAR REGULATORY COMMISSION

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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.

###

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](http://www.nrc.gov) also offers a SUBSCRIBE link. E-mail notifications are sent to subscribers when news releases are posted to NRC's website.

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**From:** LIA02 Hoc  
**Sent:** Monday, March 14, 2011 10:23 AM  
**To:** HOO Hoc; RST01 Hoc  
**Subject:** FW: 2235 14 MAR: Pol-Mil Update on USG assistance

FYI

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**From:** RMTFACTSU\_ELNRC [mailto:RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Monday, March 14, 2011 10:22 AM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA02 Hoc  
**Cc:** Gott, William; Marshall, Jane; Grant, Jeffery; McIntyre, David; Harrington, Holly  
**Subject:** FW: 2235 14 MAR: Pol-Mil Update on USG assistance

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**From:** Young, Joseph M [mailto:YoungJM@state.gov]  
**Sent:** Monday, March 14, 2011 9:38 AM  
**To:** Till, Laura A; Hefner, Timothy B; Walsh, Cody C; Brunette-Chen, Rachel; Toko, Kenichiro (Ken); Huntington, Miki T LTC USA USFJ J54; Kimura, Ayako; Toledo, Ana Y; Oikawa, Yufuko; Basalla, Suzanne I; Luke, Robert S; Zumwalt, James P; (b)(6); Wiltse, Jeffrey S COL USA USFJ J5; Epstein, Daren A GS-14 USFJ J5; Caballero, Leo F LTC USA USFJ J52; Tran, John D Maj USAF USFJ J5; Peyton, Paul P GS-14 USFJ J5; Donovan, Joseph R; Deming, Rust M; Dresser, Heather L (EAP/J); SWO; Basalla, Suzanne I; Napier, Bradford; Bradford, John F LCDR (USN) OSD POLICY; Johstone, Christopher DASD OSD; Green, Christopher L; Cote, Benjamin F LCDR USN USFJ J52; USFJ-CAT-CHIEF; EAP-J-Office-DL; Task Force 1; Beed, John A; Beed, John [USAID]; Lyons, Thomas H; (b)(6); Stitt, Tony; Hinds, Lynda J; Zareski, Karen B; Task Force 1; SES-O; Seiden, Maya D; Leou, Nancy W; Mace, Casey K; RMT\_FACTSU; ops.cat@dhs.gov; Trigilio, John (OSD); Atteberry, Christopher (OSD); Hanlon, Melissa (OSD); Clark, Ngoc (OSD); OEM-EMC; M\_Staff; Zumwalt, James P; Tokyo-Consular-Officers-DL; Donovan, Joseph R; Tokyo PolMil Unit; Basalla, Suzanne I; (b)(6); Applegate, David; charles.mcreery@noaa.gov; Benjamin, Bevan COL USA USFJ J5; Tasker, Laura L Capt USAF USFJ J5; Walker, Jon W; Cooper, Justin D; Loy, James R; Clark, Frank S; Klingmeyer, James F; ofdaPACOM; Bock, Yoni; Cooper, Justin D; Wood, Robert A; (b)(6); Kaneshiro, Claire K; Greene, Raymond F  
**Cc:** JapanEmbassy, TaskForce  
**Subject:** RE: 2235 14 MAR: Pol-Mil Update on USG assistance

Update as of 2200, Monday, March 14 JST:  
(current updates in red)

1) Nuclear Reactor

- **URGENT:** On March 14, Deputy Chief Cabinet Secretary Kawai urgently requested the Embassy to work with USFJ to provide (fire engine-like) trucks that can pump water at high pressure to assist TEPCO efforts to cool reactors #1, #2, and #3 at the Fukushima Dai-ichi nuclear power plant. Normal cooling systems are off-line at these three of the six reactors at the Dai-ichi plant. TEPCO says it needs to restore cooling to ensure the plant's safety. Embassy is in touch with USFJ J4/J5 about this request.
- **Radiation Data:** At 0130 14 Mar JST, MOFA requested radiation data collected by the USS Ronald Reagan. This data has been forwarded to Morita-san at MOFA SOFA Division. Data received from MEXT on radiation levels collected by MEXT's NUSTEC was passed on to DOE. Information regarding radiation levels sent by MEXT was forwarded to DOE. The data is collected by the Nuclear Safety Technology Center (NUSTEC), under MEXT, and will be continued to be sent to Embassy Tokyo on the hour every hour.

- Nuclear-related personnel, equipment; DOE Alan Remick and HHS Joe Hughart ([joseph.hughart@foh.hhs.gov](mailto:joseph.hughart@foh.hhs.gov) , bberry: (b)(6)) met with MOFA, NISA (Nuclear Industrial and Safety Agency) counterparts 13 Mar. NRC Jim Trapp (via Narita) expected 13 Mar. NRC Tony Ulses arrived w/SAR at Misawa, transferring to Yokota AB ert Tokyo, ETA 0630. Dosimetry equipment from Yokosuka to be passed to Jim Trapp.
- USFJ COL Town/Col Wall at MOD receiving live transcripts of the nuclear power plant radioactive materials monitoring data. DSN 224-7717 e-mail: [j3cat2nd@jso.mod.go.jp](mailto:j3cat2nd@jso.mod.go.jp). USFJ cannot support this request, and the GOJ was informed at 2330 JST Sun, Mar 13 Water buckets operation to help cool Fukushima No. 3 Pump.

2) Global Hawk:

- GOJ requested permission to release publicly images taken by Global Hawk. Permission was granted. GOJ may release UNCLASSIFIED Global Hawk photos they have obtained, even those obtained from various "Operation TOMADACHI" websites. However, the USG WILL NOT be releasing Global Hawk information to the press.

3) III MEF Update:

- MOFA has authorized setting up a FARP (forward refueling point) at Yamagata Airfield. III MEF intends to conduct ops to move further north in Sendai area today to link up with the JGSDF NE Army and establish a FARP at Yamagata. There will be co-location of III MEF with SDF Disaster Relief JTF in Sendai.
- USS Essex is still en route--ETA is 0700, March 16 JST.

4) FCM Assistance

- GOJ is not proceeding at this time with a request for Foreign Consequence Management Support from USG.

5) Search and Rescue (SAR) Team Flight Update:

- MREs: 120 cases of MRE's from Misawa were distributed by the DART team.
- DART deploying at 0600 14 Mar JST to Ofunato city, working w/Tokyo firefighters.  
On ground DART POC: Dewey Perks, [dperks@usaid.gov](mailto:dperks@usaid.gov) , phone (berry) (b)(6)
- Interpreters secured.

6) Usage of USAF Bases – USFJ has confirmed that due to dwindling resources at Misawa, aircraft may need to be flowed into Yokota AB (USFJ has previously approved GOJ use of both Misawa and Yokota for Third Country aircraft). USFJ is working this issue through our USAFJ chain to confirm recommendation for general flow of TCN aircraft.

- ROK: SAR team of 5 people, 2 rescue dogs arrived at Hanamaki Airport, moved to the south of Sendai, will begin ops in the morning, 14 Mar JST. No further information on ROK offer of aid.
- UK: 77 British personnel arrived on Misawa AB to support the SAR mission in Iwate Ohunato area, and are en route to Ofunato.
- Australia: SAR team arrived at Yokota AB, will operate in Minamisanriku-cho. Departing 2300, March 14, by road. Australian Embassy has arranged transportation to the area of

operation. The C-17 that brought the team will remain in Japan for one week. A further 19 Australian personnel will arrive in Yokota tomorrow, March 15, to supplement the C-17 crew. Additional personnel will include maintenance, air load team, and a command element.

- Canada: GOJ has requested Canadian Government to send supplies like blankets, bottled water, mattresses, and poly-cans or containers to collect and asked how much such aid could be provided. Canadian Defense Attache will inform UNC(R) of any planned aircraft for this effort. Canada is also considering forensic medical team when SAR phase is complete.
- New Zealand: Advance team married up with Australian USAR team on March 14. An Air New Zealand charter will arrive at Narita at 1645 JST on March 14 with the main body. As NZ teams have been allocated to Mainami Sanriku, Miyagi prefecture, to conduct their activities they will team with Australia and also travel by road.
- Turkey: Turkish Government has offered to send 3 x C-130 with disaster relief supplies/equipment plus a SAR team of 32 personnel and equipment to assist GOJ. Japan has replied affirmatively to accept the SAR teams. Turkish Government is currently preparing a group of SAR teams to arrive at Japan via commercial airlines. Turkish Defense Attache will provide further details as they are determined.
- India: India has offered relief supplies through the Japanese DATT in India. MOFA is working internally to confirm that they are aware of this offer and to determine how they want to proceed. Will need to determine if Yokota AB is the appropriate place for Indian IL-76 with relief supplies to land, awaiting MOFA coordination.
- Russian aircraft (initially being discussed as possibly coming into Misawa) arrived Narita at approx. 1100 hrs; additional details on Russian support and composition is pending confirmation

7) USS Ronald Reagan Carrier Strike Group positioned off Miyagi Coast; : USS Ronald Reagan (CVN-76) - aircraft carrier; USS Preble (DDG-88) – destroyer; USS McCampbell (DDG-85) – destroyer; USS Curtis Wilbur (DDG-54) – destroyer; USS Chancellorsville (CG-62) – cruiser; USS McCain (DDG-56) - destroyer

- The USS Ronald Reagan Carrier Strike Group temporarily repositioned its ships and aircraft away from the Fukushima Dai-Ichi Nuclear Power Plant after detecting low level contamination in the air and on its aircraft operating in the area.
- USS Reagan has continued SAR missions using helicopters.

8) USN Transport Support

- TORTUGA en route to TOMAKOMAI, HOKKAIDO (ETA: 0900, March 15), to load approximately 280 JAPANESE SOLIDERS AND 90 VEHICLES for transport to Hachinohe, HONSHU.

Embassy Tokyo Consular Crisis Field Team has arrived in Sendai.

9) Requests/Offer for relief supplies

- MOFA SOFA Division officially requested relief supplies from USFJ including blankets, mattresses, bottled water, and plastic tanks for water. GOJ has relayed list of specific requests to USFJ, and USFJ has responded by sending a list of available supplies to MOFA.
- Walmart offer to donate bottled water: Walmart met with USFJ this afternoon to discuss delivery of bottled water to Yokota as well as means to unload/distro (probably at Yamagata).

- The Kameda Medical Center in Chiba has offered to receive Japanese civilians who are picked up by U.S. military vehicles/helicopters for medical treatment. The Kameda Center has conveyed this offer directly to Yokosuka Naval Hospital.
  - GOJ request from Mayor of Ishimaki-City relief supplies. List includes: increased rescue activities by helicopters; sufficient and continuous supply of meals and drinking water; blankets and winter cloths; fuel (e.g. kerosene for heaters); disposable diapers, powder milk, medicines; radios and other telecommunication devices; temporary toilets, and life raft. Request communicated to USFJ.
- 10) GOJ requested U.S. military assistance to help clean up Sendai airport. USFJ is coordinating with service components.
- 11) Embassy Tokyo Pol-Mil has forwarded to U.S. Department of Energy, National Nuclear Security Administration, a USFJ request for Aerial Measuring System. Awaiting reply.

Joe Young  
 Political-Military Unit Chief  
 U.S. Embassy, Tokyo  
 03-3224-5338

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**From:** Till, Laura A  
**Sent:** Monday, March 14, 2011 5:24 PM  
**To:** Hefner, Timothy B; Walsh, Cody C; Brunette-Chen, Rachel; Young, Joseph M; Toko, Kenichiro (Ken); 'Huntington, Miki T LTC USA USFJ J54'; Kimura, Ayako; Toledo, Ana Y; Oikawa, Yufuko; Basalla, Suzanne I; Luke, Robert S; Zumwalt, James P; (b)(6); 'Wiltse, Jeffrey S COL USA USFJ J5'; 'Epstein, Daren A GS-14 USFJ J5'; 'Caballero, Leo F LTC USA USFJ J52'; 'Tran, John D Maj USAF USFJ J5'; 'Peyton, Paul P GS-14 USFJ J5'; Donovan, Joseph R; Deming, Rust M; Dresser, Heather L (EAP/J); SWO; Basalla, Suzanne I; Napier, Bradford; 'Bradford, John F LCDR (USN) OSD POLICY'; 'Johstone, Christopher DASD OSD'; Green, Christopher L; 'Cote, Benjamin F LCDR USN USFJ J52'; 'USFJ-CAT-CHIEF'; EAP-J-Office-DL; TaskForce-1; Beed, John A; Beed, John; Lyons, Thomas H; (b)(6); 'Stitt, Tony'; Hinds, Lynda J; Zareski, Karen B; TaskForce-1; SES-O; Seiden, Maya D; Leou, Nancy W; Mace, Casey K; 'rmt\_pactsu@ofda.gov'; 'ops.cat@dhs.gov'; 'Trigilio, John, CIV, OSD-POLICY'; 'Atteberry, Christopher L Col (USAF) OSD POLICY'; 'Hanlon, Melissa, CIV, OSD-POLICY'; 'Clark, Ngoc CIV OSD POLICY'; OEM-EMC; M. Staff; Zumwalt, James P; Tokyo-Consular-Officers-DL; Donovan, Joseph R; Tokyo PolMil Unit; Basalla, Suzanne I; (b)(6); (b)(6); Applegate, David; 'charles.mcreery@noaa.gov'; 'Benjamin, Bevan COL USA USFJ J5'; 'Tasker, Laura L Capt USAF USFJ J5'; Walker, Jon W; Cooper, Justin D; Loy, James R; Clark, Frank S; Klingmeyer, James F; 'ofdacom@ofda.gov'; 'Bock, Yoni'; Cooper, Justin D; Wood, Robert A; (b)(6); Kaneshiro, Claire K; Greene, Raymond F  
**Cc:** JapanEmbassy, TaskForce  
**Subject:** 1700 14 MAR: Pol-Mil Update on USG assistance

Updates as of 1700, Monday, March 14 JST:  
 (current updates in red)

- 12) Nuclear Reactor - USFJ COL Town/Col Wall at MOD receiving live transcripts of the nuclear power plant radioactive materials monitoring data. DSN 224-7717 e-mail: [j3cat2nd@jso.mod.go.jp](mailto:j3cat2nd@jso.mod.go.jp).
- a. Radiation Data: At 0130 14 Mar JST, MOFA requested radiation data collected by the USS Ronald Reagan. This data has been forwarded to Morita-san at MOFA SOFA Division. Data received from MEXT on radiation levels collected by MEXT's NUSTEC was passed on to DOE. Information regarding radiation levels sent by MEXT was forwarded to DOE. The data is collected by the Nuclear Safety Technology Center (NUSTEC), under MEXT, and will be continued to be sent to Embassy Tokyo on the hour every hour.
  - b.



- c. Nuclear-related personnel, equipment: DOE Alan Remick and HHS Joe Hughart ([joseph.hughart@foh.hhs.gov](mailto:joseph.hughart@foh.hhs.gov) , bberry: (b)(6)) met with MOFA, NISA (Nuclear Industrial and Safety Agency) counterparts 13 Mar. NRC Jim Trapp (via Narita) expected 13 Mar. NRC Tony Ulises arrived w/SAR at Misawa, transferring to Yokota AB ert Tokyo, ETA 0630. Dosimetry equipment from Yokosuka to be passed to Jim Trapp.
- d. USFJ cannot support this request, and the GOJ was informed at 2330 JST Sun, Mar 13 Water buckets operation to help cool Fukushima No. 3 Pump.

13) Global Hawk:

- a. GOJ requested permission to release publicly images taken by Global Hawk. Permission was granted. GOJ may release UNCLASSIFIED Global Hawk photos they have obtained, even those obtained from various "Operation TOMADACHI" websites. However, the USG WILL NOT be releasing Global Hawk information to the press.

14) III MEF Update:

- a. MOFA has authorized setting up a FARP (forward refueling point) at Yamagata Airfield. III MEF intends to conduct ops to move further north in Sendai area today to link up with the JGSDF NE Army and establish a FARP at Yamagata.
- b. USS Essex is still enroute--ETA is 0700 14 Mar JST.

15) FCM Assistance:

- a. GOJ is not proceeding with a request for Foreign Consequence Management Support from USG.

16) Search and Rescue (SAR) Team

Flight Update:

- a. USA 1 (Cargo) from Andrews AFB in DoD C-17 wheels down at Misawa 1415z/ 2315 JST, reported 1425z/2325 local time/1040 EST
- b. MREs: 120 cases of MRE's from Misawa were distributed by the DART team.
- c. DART deploying at 0600 14 Mar JST to Ofunato city, working w/Tokyo firefighters. On ground DART POC: Dewey Perks, [dperks@usaid.gov](mailto:dperks@usaid.gov) , phone (berry (b)(6))
- d. Interpreters: DART team need 4-total interpreters, also have 2 MOFA reps in tow. Misawa AB seeking options as of 2000 13 Mar JST.

17) Usage of USAF Bases – USFJ has confirmed that due to dwindling resources at Misawa, aircraft may need to be flowed into Yokota AB (USFJ has previously approved GOJ use of both Misawa and Yokota for Third Country aircraft). USFJ is working this issue through our USAFJ chain to confirm recommendation for general flow of TCN aircraft.

- a. ROK: SAR team of 5 people, 2 rescue dogs arrived at Hanamaki Airport, moved to the south of Sendai, will begin ops in the morning, 14 Mar JST. No further information on ROK offer of aid.
- b. UK: 77 British personnel arrived on Misawa AB to support the SAR mission in Iwate Ohunato area, and are en route to Ofunato.
- c. Australia: SAR team arrived at Yokota AB, will operate in Minamisanriku-cho.
- d. Singapore: No update on SAR team of 5 members, 5 dogs, in Fukushima.
- e. NZ: 55 member SAR team scheduled to arrive at Narita at 1630 14 Mar JST
- f. France: SAR team of 131 members will arrive at Narita on March 14 local time and move to Misawa AB; MOFA is handling initial coordination directly with USFJ for French SAR team.

- g. China: MOFA confirmed that the team arrived in Iwate Prefecture on March 13 at 1230 at Haneda and is en route to Tohoku. Press reports that they arrived in Japan with four tons of materials and equipment for search and rescue, power supplies and telecommunication.
- h. India has offered relief supplies through the Japanese DATT in India. MOFA is working internally to confirm that they are aware of this offer and to determine how they want to proceed. Will need to determine if Yokota AB is the appropriate place for Indian IL-76 with relief supplies to land, awaiting MOFA coordination.
- i. Russian aircraft (initially being discussed as possibly coming into Misawa) arrived Narita at approx. 1100 hrs; additional details on Russian support and composition is pending confirmation

18) USS Ronald Reagan Carrier Strike Group was positioned off Miyagi Coast; : USS Ronald Reagan (CVN-76) - aircraft carrier; USS Preble (DDG-88) – destroyer; USS McCampbell (DDG-85) – destroyer; USS Curtis Wilbur (DDG-54) – destroyer; USS Chancellorsville (CG-62) – cruiser; USS McCain (DDG-56) - destroyer

- a. The USS Ronald Reagan Carrier Strike Group has temporarily repositioned its ships and aircraft away from the Fukushima Dai-ichi Nuclear Power Plant after detecting low level contamination in the air and on its aircraft operating in the area.
- b. USS Reagan has continued SAR missions using helo's.

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- a. TORTUGA enroute to TOMAKOMAI, HOKKAIDO (Arrival: 0900L 15MAR11), to load approximately 280 JAPANESE SOLIDERS AND 90 VEHICLES for transport to Hachinohe, HONSHU.
- b. Embassy Tokyo Consular Crisis Field Team has arrived in Sendai.

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- a. MOFA SOFA Division officially requested relief supplies from USFJ including blankets, mattresses, bottled water, and plastic tanks for water.
- b. GOJ has relayed list of specific requests to USFJ, and USFJ has responded by sending a list of available supplies to MOFA.
- c. Walmart offer to donate bottled water: Walmart met with USFJ this afternoon to discuss delivery of bottled water to Yokota as well as means to unload/distro(probably at Yamagata).

10. GOJ requested U.S. military assistance to help clean up Sendai airport.

Laura Till  
 Political Military Unit  
 U.S. Embassy Tokyo  
 03-3224-5335  
<http://japan.usembassy.gov/>

This email is UNCLASSIFIED.

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**From:** Hefner, Timothy B  
**Sent:** Monday, March 14, 2011 5:10 AM  
**To:** Walsh, Cody C; Brunette-Chen, Rachel; Till, Laura A; Young, Joseph M; Toko, Kenichiro (Ken); 'Huntington, Miki T LTC USA USFJ J54'; Kimura, Ayako; Toledo, Ana Y; Oikawa, Yufuko; Basalla, Suzanne I; Luke, Robert S;

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**Subject:** 0500 14 MAR: Pol-Mil Update on USG assistance

Updates as of 0500, Monday, March 14 JST:

11. Nuclear Reactor - USFJ COL Town/Col Wall at MOD receiving live transcripts of the nuclear power plant radioactive materials monitoring data. DSN 224-7717 e-mail: [j3cat2nd@jso.mod.go.jp](mailto:j3cat2nd@jso.mod.go.jp).

- a. Radiation Data: At 0130 14 Mar JST, MOFA requested radiation data collected by the USS Ronald Reagan. MOFA was informed that Emb DOE rep can provide this to them; pending response from DOE on this.
- b. Nuclear-related personnel, equipment: DOE Alan Remick and HHS Joe Hughart ([joseph.hughart@foh.hhs.gov](mailto:joseph.hughart@foh.hhs.gov), bberry: (b)(6)) met with MOFA, NISA (Nuclear Industrial and Safety Agency) counterparts 13 Mar. NRC Jim Trapp (via Narita) expected 13 Mar. NRC Tony Ulses arrived w/SAR at Misawa, transferring to Yokota AB ert Tokyo, ETA 0630. Dosimetry equipment from Yokosuka to be passed to Jim Trapp.
- c. USFJ cannot support this request, and the GOJ was informed at 2330 JST Sun, Mar 13 Water buckets operation to help cool Fukushima No. 3 Pump.

12. Global Hawk:

- a. GOJ is seeking permission to release publicly images taken by Global Hawk. Please advise.

13. III MEF Update:

- a. III MEF has 9X KC130J and 2X CH-46 at Iwakuni and 5X CH-46 at Atsugi. III MEF FWD conducted a link up w/Liaison at NE Army CG and conducted a survey of Yamagata Airfield to look at the feasibility of setting up a FARP (forward refueling point). 238 pax are deployed throughout Honshu. III MEF intends to conduct ops to move further north in Sendai area today to link up with the JGSDF NE Army and establish a FARP at Yamagata.
- b. USS Essex is still enroute--ETA is 0700 14 Mar JST.

14. FCM Assistance:

- a. GOJ is not proceeding with a request for Foreign Consequence Management Support from USG.

15. Search and Rescue (SAR) Team

Flight Update:

- a. USA 1 (Cargo) from Andrews AFB in DoD C-17 wheels down at Misawa 1415z/ 2315 JST, reported 1425z/2325 local time/1040 EST
- b. MREs: As of 0122, DART working with USAID RMT on securing 120 cases from Misawa. Misawa-USFJ-AFPAC seeking approval from DOS and Unified Commander, as MRE's not intended for non-DOD personnel. DOS consented via Telcon with TaskForce 0100; OSD asking if MREs provided on reimbursable basis.
- c. DART deploying at 0600 14 Mar JST to Ofunato city, working w/Tokyo firefighters.

On ground DART POC: Dewey Perks, [dperks@usaid.gov](mailto:dperks@usaid.gov) , phone (berry) (b)(6)

- d. Interpreters: DART team need 4-total interpreters, also have 2 MOFA reps in tow. Misawa AB seeking options as of 2000 13 Mar JST.
16. Usage of USAF Bases – GOJ authorized to use Misawa AB & Yokota AB for third country aircraft for HA/DR personnel and supplies. GOJ provided authorization for third country SAR teams to access base Exchange/Commissary
- j. ROK: SAR team of 5 people, 2 rescue dogs arrived at Hanamaki Airport, moved to the south of Sendai, will begin ops in the morning, 14 Mar JST. No further information on ROK offer of aid.
  - k. UK: 77 British personnel arrived on Misawa AB to support the SAR mission in Iwate Ohunato area, seeking confirmation from MOFA and USAID on ground personnel ([dperks@usaid.gov](mailto:dperks@usaid.gov)) that British will conduct SAR mission jointly with US teams, time it will start mission, and trans details.
  - l. Australia: SAR team arrived at Yokota AB, will operate in Minamisanriku-cho.
  - m. Singapore: No Update on SAR team of 5 members, 5 dogs, in Fukushima.
  - n. NZ: 55 member SAR team scheduled to arrive at Narita at 1630 14 Mar JST
  - o. France: SAR team of 131 members will arrive at Narita on March 14 local time and move to Misawa AB; MOFA is handling initial coordination directly with USFJ for French SAR team.
  - p. China: MOFA confirmed that the team arrived in Iwate Prefecture. Press reports that they arrived in Japan with four tons of materials and equipment for search and rescue, power supplies and telecommunication.
  - q. India has offered relief supplies through the Japanese DATT in India. MOFA is working internally to confirm that they are aware of this offer and to determine how they want to proceed. Will need to determine if Yokota AB is the appropriate place for Indian IL-76 with relief supplies to land.
17. USS Ronald Reagan Carrier Strike Group positioned off Miyagi Coast: USS Ronald Reagan (CVN-76) - aircraft carrier; USS Preble (DDG-88) – destroyer; USS McCampbell (DDG-85) – destroyer; USS Curtis Wilbur (DDG-54) – destroyer; USS Chancellorsville (CG-62) – cruiser; USS McCain (DDG-56) - destroyer
- a. Carried out activities as planned (6 SAR missions and shoreline and coastal water assessment were scheduled for 13 Mar). no update on outcomes.
18. USN Transport Support
- a. USS Tortuga moving to assist request for transport of GSDF Northern Army from Tomakomai to Hachinoe. PACOM authorized USFJ to employ HSV transport; HSV in Okinawa and would take longer than Tortuga to arrive and assist (Tortuga forward deployed at Sasebo. ETA 0800-0900 15 Mar JST.
  - b. Embassy Tokyo Consular Crisis Field Team has arrived in Sendai.

Tim Hefner  
Pol-Mil Unit  
U.S. Embassy Tokyo  
TEL: +81 3 3224-5344 (x5247 today)  
[HefnerTB@state.gov](mailto:HefnerTB@state.gov)

SBU

This email is UNCLASSIFIED.

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**From:** Walsh, Cody C

**Sent:** Sunday, March 13, 2011 11:38 PM

**To:** Brunette-Chen, Rachel; Till, Laura A; Young, Joseph M; Hefner, Timothy B; Toko, Kenichiro (Ken); 'Huntington, Miki T LTC USA USFJ J54'; Kimura, Ayako; Toledo, Ana Y; Oikawa, Yufuko; Basalla, Suzanne I; Luke, Robert S; Zumwalt, James P; (b)(6); 'Wiltse, Jeffrey S COL USA USFJ J5'; 'Epstein, Daren A GS-14 USFJ J5'; 'Caballero, Leo F LTC USA USFJ J52'; 'Tran, John D Maj USAF USFJ J5'; 'Peyton, Paul P GS-14 USFJ J5'; Donovan, Joseph R; Deming, Rust M; Dresser, Heather L (EAP/J); SWO; Basalla, Suzanne I; Napier, Bradford; 'Bradford, John F LCDR (USN) OSD POLICY'; 'Johstone, Christopher D ASD OSD'; Green, Christopher L; 'Cote, Benjamin F LCDR USN USFJ J52'; 'USFJ-CAT-CHIEF'; EAP-J-Office-DL; TaskForce-1; Beed, John A; Beed, John; Lyons, Thomas H; (b)(6); 'Stitt, Tony'; Hinds, Lynda J; Zareski, Karen B; TaskForce-1; SES-O; Seiden, Maya D; Leou, Nancy W; Mace, Casey K; 'rmt\_pactsu@ofda.gov'; 'ops.cat@dhs.gov'; 'Trigilio, John, CIV, OSD-POLICY'; 'Atteberry, Christopher L Col (USAF) OSD POLICY'; 'Hanlon, Melissa, CIV, OSD-POLICY'; 'Clark, Ngoc CIV OSD POLICY'; OEM-EMC; M\_Staff; Zumwalt, James P; Tokyo-Consular-Officers-DL; Donovan, Joseph R; Tokyo PolMil Unit; Basalla, Suzanne I; (b)(6) Applegate, David; 'charles.mcreery@noaa.gov'; 'Benjamin, Bevan COL USA USFJ J5'; 'Tasker, Laura L Capt USAF USFJ J5'; Walker, Jon W; Cooper, Justin D; Loy, James R; Clark, Frank S; Klingmeyer, James F; 'ofdapacom@ofda.gov'; 'Bock, Yoni'; Cooper, Justin D

**Subject:** 2330 13 MAR: Pol-Mil Update on USG assistance

Cody Walsh is signing off at 2330 local time, and Tim Hefner is covering the Embassy Tokyo Pol-Mil shift. He can be reached at 3224-5344 or [TokyoPolMilUnit@state.gov](mailto:TokyoPolMilUnit@state.gov).

Updates as of 23:30, Sunday, March 13, JST: Changes since the last update are highlighted in red.

#### 19. Nuclear Reactor

- a. Water buckets operation to help cool Fukushima No. 3 Pump: USFJ has not received indication they can support the water buckets operation (either helos not immediately available or no equipment for water bucket mission). USFJ is still researching resource availability in Okinawa, but even if available, due to transport time and questions surrounding the safety of this COA, USFJ is not recommending US service personnel to conduct the mission. Emb Tokyo has communicated to MOFA the difficulties to support this request citing resource availability and informed MOFA that we will advise should there be any change of status.
- b. John Beed has asked DC to confirm arrival of any and all nuclear-related personnel, equipment coming as part of DART/search-rescue teams. Four nuclear specialists are en route: 1 with the DART team that arrived in Misawa at 15:22 and three coming into Narita airport.
- c. Alan Remick from DOE and Joe Hughart from HHS arrived in Tokyo and are meeting at MOFA with their NISA (Nuclear Industrial and Safety Agency) counterparts. MOFA Nuclear Division's Kazumi Yamada confirmed she shared the seven questions from DOE with GOJ's NISA this evening, ahead of the meeting.
- d. USFJ COL Town and Col Wall are taking alternating shifts at Ichigaya and are receiving the live transcripts of the nuclear power plant radioactive materials monitoring data. They may be reached as follows. DSN 224-7717 e-mail: [j3cat2nd@jso.mod.go.jp](mailto:j3cat2nd@jso.mod.go.jp).

#### 20. FCM Assistance:

- a. GOJ is not proceeding with a request for Foreign Consequence Management Support from USG.

#### 21. Search and Rescue (SAR) Team

- a. Arrived Sunday, Mar 13, 15:22 JST at Misawa. DART is being sent to Ofunato city and area and will work in tandem with Tokyo firefighters team we don't know how long they will conduct operations.
- b. Two MOFA officers will perform liaison functions at Misawa.

- c. Iwate Prefecture wants the team to have a sufficient number of interpreters (ideally, at least five) before deploying to disaster areas. Per USAID EMB representative, John Beed, the Search and Rescue teams have indicated they believe they will be able to mobilize additional interpreters to accompany the SAR from within Misawa AB. CG Sapporo confirmed two AMCITs based in Hirosaki are available to volunteer as interpreters if needed. As requested by AMCITs volunteers, Misawa SAR POC information shared with AMCITs.

## 22. Usage of USAF Bases

- r. GOJ is authorized to use Misawa AB and Yokota AB for third country aircraft who wish to send aircraft for HA/DR personnel and supplies.
- s. MOFA gave the green light for of third country SAR teams arriving at U.S. bases to have access to duty-free goods at the on base Exchange or Commissary. They did ask that third country SAR members have their IDs checked at the door (like all base personnel) to ensure that access is restricted to those who are authorized for access
- t. ROK: SAR team of 5 members and 2 rescue dog arrived at Hanamaki Airport and moved to the south of Sendai. They are now standing by and will start rescue operations in on Monday morning, March 14 local time. MOFA also confirmed knowledge of ROK offer of aid, details on specifics for delivery pending.
- u. UK: SAR team, with 63 members and 2 dogs, arrived at Misawa AB at 2000 JST; no updates on destination for relief activities.
- v. Australia: SAR team will arrive via C-17 aircraft at Yokota Air Base at 0140 JST, March 14. USFJ is currently coordinating quarantine requirements for rescue dogs. USFJ J4 is coordinating Australian need access to the base for contracted vehicles, fuel and water.
- w. Singapore: SAR team of 5 members, 5 dogs, arrived at Narita yesterday on March 12 and moved to Fukushima to support relief activities.
- x. New Zealand: SAR team of 55 members is scheduled to arrive at Narita at 1630 local time on March 14 at Narita
- y. France: SAR team of 131 members will arrive at Narita on March 14 local time and move to Misawa AB; MOFA is handling initial coordination directly with USFJ for French SAR team.
- z. MOFA confirmed that Chinese rescue team arrived at 12:30 PM in Haneda and is enroute to Tohoku region (exact location was TBD).

## 23. USS Ronald Reagan Carrier Strike Group

- a. Positioned off the Miyagi Coast.
- b. Will conduct SAR operations starting at first light, three in the morning and three in the afternoon.
- c. Along with SAR, will be conducting an assessment of the shoreline and coastal waters

## 24. USN Transport Support

- a. MOFA reconfirmed the request for transport of GSDF Northern Army from Otaru to Akita.
- b. The first 700 GSDF personnel departed by commercial ferry on March 12, but more will follow the next few days, and MOFA reconfirmed continued request for transport support.
- c. PACOM JOC sent a message, USFJ was authorized to employ HSV transport
- d. Embassy Tokyo Consular Crisis Field Team has requested transport from Yokota to Misawa

This email is UNCLASSIFIED.

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**From:** Brunette-Chen, Rachel

**Sent:** Sunday, March 13, 2011 4:54 PM

**To:** Till, Laura A; Young, Joseph M; Hefner, Timothy B; Toko, Kenichiro (Ken); Walsh, Cody C; 'Huntington, Miki T LTC USA USFJ J54'; Kimura, Ayako; Toledo, Ana Y; Oikawa, Yufuko; Basalla, Suzanne I; Luke, Robert S; Zumwalt, James P; (b)(6); 'Wiltse, Jeffrey S COL USA USFJ J5'; 'Epstein, Daren A GS-14 USFJ J5'; 'Caballero, Leo F LTC USA USFJ J52'; 'Tran, John D Maj USAF USFJ J5'; 'Peyton, Paul P GS-14 USFJ J5'; Donovan,

Joseph R; Deming, Rust M; Dresser, Heather L (EAP/J); SWO; Basalla, Suzanne I; Napier, Bradford; 'Bradford, John F LCDR (USN) OSD POLICY'; 'Johstone, Christopher DASD OSD'; Green, Christopher L; 'Cote, Benjamin F LCDR USN USFJ J52'; 'USFJ-CAT-CHIEF'; EAP-J-Office-DL; TaskForce-1; Beed, John A; Beed, John; Lyons, Thomas H; (b)(6); 'Stitt, Tony'; Hinds, Lynda J; Zareski, Karen B; TaskForce-1; SES-O; Seiden, Maya D; Leou, Nancy W; Mace, Casey K; 'rmt\_pactsu@ofda.gov'; 'ops.cat@dhs.gov'; 'Trigilio, John, CIV, OSD-POLICY'; 'Atteberry, Christopher L Col (USAF) OSD POLICY'; 'Hanlon, Melissa, CIV, OSD-POLICY'; 'Clark, Ngoc CIV OSD POLICY'; OEM-EMC; M\_Staff; Zumwalt, James P; Tokyo-Consular-Officers-DL; Donovan, Joseph R; Tokyo PolMil Unit; Basalla, Suzanne I; (b)(6); Applegate, David; 'charles.mcreery@noaa.gov'; 'Benjamin, Bevan COL USA USFJ J5'; 'Tasker, Laura L Capt USAF USFJ J5'; Walker, Jon W; Cooper, Justin D; Loy, James R; Clark, Frank S; Klingmeyer, James F; 'ofdacom@ofda.gov'; 'Bock, Yoni'

**Subject:** RE: GOJ Requests for Assistance- Updates 1630 JST 13MAR2011

Rachel Brunette-Chen signing off at 17:00. Cody Walsh is now taking over. He may be contacted at 3224-5337 or [tokyopolmilunit@state.gov](mailto:tokyopolmilunit@state.gov). Unit Chief Joe Young is also currently in the office at x. 5338. Thank you.

Updates as of 16:00, Sunday, March 13. JST: Changes since the last update are highlighted in red.

#### 25. Nuclear Reactor

- a. MOFA officially requested assistance in the form of USFJ helo's to conduct "water bucket" operations (haul water via sling load as we do during firefighting operations) to help cool the No. 3 Pump at Fukushima, which is in a critical condition; similar to No. 1 Pump that exploded yesterday. JSDf has also been tasked with this mission. We are waiting for GOJ safety data for crews to fly over. USFJ says initial read is there are limited assets but they are re-confirming with service components.
- b. John Beed has asked DC to confirm arrival of any and all nuclear-related personnel, equipment coming as part of DART/search-rescue teams. Four nuclear specialists are en route: 1 with the DART team that arrived in Misawa at 15:22 and three coming into Narita airport.
- c. MOFA has asked us to contact them regarding details on the nuclear specialists, including their destinations/plans. Ron Cherry is working this issue with Kazumi Yamada in the MOFA International Nuclear Energy Cooperation Division. If you receive inquiries from MOFA about nuclear specialists, please inform them that they may contact Ms. Yamada. Duty Officer has informed MOFA contacts to reach out to Ms. Yamada.
- d. USFJ COL Town and Col Wall are taking alternating shifts at Ichigaya and are receiving the live transcripts of the nuclear power plant radioactive materials monitoring data. They may be reached as follows. DSN 224-7717 e-mail: [j3cat2nd@jso.mod.go.jp](mailto:j3cat2nd@jso.mod.go.jp).

#### 26. FCM Assistance:

- a. GOJ is not proceeding with a request for Foreign Consequence Management Support from USG.

#### 27. Search and Rescue (SAR) Team

- a. Arrived Sunday, Mar 13, 15:22 JST at Misawa. DART is being sent to Ofunato city and area and will work in tandem with Tokyo firefighters team we don't know how long they will conduct operations.
- b. Two MOFA officers will perform liaison functions at Misawa.
- c. Iwate Prefecture wants the team to have a sufficient number of interpreters (ideally, at least five) before deploying to disaster areas. OFDA has confirmed that there are native Japanese speakers among the team members and is confirming the number. Sapporo Consulate has offered to provide two interpreters, and has a third Amcift contact in Aomori who has volunteered to interpret. Transportation would be required to the disaster area.
- d. AUS SAR Team is en route Yokota AB; ETA 0140 local time Monday, March 14. USFJ is currently coordinating quarantine requirements for rescue dogs.
- e. Embassy and USFJ have asked MOFA for SOFA privileges (NOT formal SOFA status) for foreign aid teams arriving in Yokota/Misawa to enable foreign aid personnel to purchase needed materials at the base exchanges. MOFA has informed us that they are working on this and coordinating it with the Ministry of Finance. PolMil Dutyoff encouraged MOFA to move this request through

quickly to enable rescue personnel to get the supplies they need. MOFA informed PolMil dutyoff that they will reach out to us as soon as they hear back from MOF, but they are not expecting an answer to arrive quickly because it will require senior-level approval. MOFA has the phone numbers for the two pol-mil officers taking over the next shift.

28. Usage of USAF Bases

- aa. GOJ is authorized to use Misawa AB and Yokota AB for third country aircraft who wish to send aircraft for HA/DR personnel and supplies
- bb. MOFA confirmed ROK team (5 personnel, at least one rescue dog) landed at Haneda, transported by SDF to Hanamaki Airport in Iwate Prefecture. MOFA also confirmed knowledge of ROK offer of aid, details on specifics for delivery pending.
- cc. UK SAR team, with 63 members, is en route to Misawa; ETA O/A 1500
- dd. Australia team will arrive via C-17 aircraft at Yokota Air Base at 0140 JST, March 14.
- ee. Update on Singapore team pending.
- ff. Update on NZ team to Misawa pending.
- gg. MOFA confirmed that Chinese rescue team arrived at 12:30 PM in Haneda and is enroute to Tohoku region (exact location was TBD).

29. USS Ronald Reagan Carrier Strike Group (Cody will follow up during next shift).

- a. Positioned off the Miyagi Coast.
- b. Will conduct SAR operations starting at first light, three in the morning and three in the afternoon.
- c. Along with SAR, will be conducting an assessment of the shoreline and coastal waters.

30. USN Transport Support

- a. MOFA reconfirmed the request for transport of GSDF Northern Army from Otaru to Akita.
- b. The first 700 GSDF personnel departed by commercial ferry on March 12, but more will follow the next few days, and MOFA reconfirmed continued request for transport support.
- c. PACOM JOC sent a message, USFJ was authorized to employ HSV transport
- d. Embassy Tokyo Consular Crisis Field Team has requested transport from Yokota to Misawa

This email is UNCLASSIFIED.



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**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 10:19 AM  
**To:** LIA01 Hoc  
**Subject:** FW: Status Update

**Categories:** FOIA

-----Original Message-----

**From:** St George, Jeffrey J LCDR NAVSEA, 08 [mailto:(b)(6)]  
**Sent:** Monday, March 14, 2011 4:32 AM  
**To:** LIA11 Hoc  
**Subject:** RE: Status Update

Mr. Smith -

You have the correct address.

Very respectfully,

Jeff St. George  
DOE/Naval Reactors, 08B-LL  
S6G/S6W Engineer  
(w) 202.781.6007  
(c) (b)(6)  
(b)(6)

-----Original Message-----

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Monday, March 14, 2011 4:29  
**To:** St George, Jeffrey J LCDR NAVSEA, 08  
**Subject:** Status Update

The status update for NRC is pending soon. Just confirming this is the correct email address.

R/

Ted Smith

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**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Monday, March 14, 2011 9:26 AM  
**To:** LIA11 Hoc; LIA07 Hoc; LIA01 Hoc  
**Cc:** McDermott, Brian; Marshall, Jane; Gott, William; Grant, Jeffery;  
**Subject:** (b)(6)  
FW: another GoJ request

**Importance:** High

**Categories:** FOIA

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**From:** RMTPACTSU\_DMP  
**Sent:** Monday, March 14, 2011 8:56 AM  
**To:** Shete, Priya; RMTPACTSU\_RM; RMTPACTSU\_DMO; RMTPACTSU\_ELNRC; DARTNRCLiaison1; DARTNRCLiaison2  
**Cc:** Stickman, Elizabeth  
**Subject:** RE: another GoJ request  
**Importance:** High

Thanks for passing this on Priya. I'm copying Jason and Mike (NRC on the RMT), as well as Tony and Jim (NRC DART). Jason/Mike/Tony/Jim – can you let us know if this the same request that you're already tracking, and if it's new can you let us know if it's validated?

Thanks,  
Gavi

*Gavrielle Rosenthal  
Deputy Manager for Planning  
Pacific Tsunami and Japan Earthquake Response Management Team  
USAID/DHCA/OFDA  
[Rmtpactsu\\_dmp@ofda.gov](mailto:Rmtpactsu_dmp@ofda.gov)  
202-712-0039*

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**From:** Shete, Priya  
**Sent:** Monday, March 14, 2011 7:57 AM  
**To:** RMTPACTSU\_RM; RMTPACTSU\_DMO; RMTPACTSU\_DMP  
**Cc:** Stickman, Elizabeth  
**Subject:** another GoJ request

Hi,  
Sorry to bombard you with yet another GoJ "request," but this just came through State (via EAP desk) and could use validation from the DART. It's basically for pumps to get water into the reactor core to assist with cooling. Please let me know if it is validated on your end as a true request, TF-1 is becoming anxious. Also, please reply to all so that Elizabeth will have this information when she comes on.

Thanks,  
Priya

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**From:** CMS TaskForce1F - USAID [mailto:1TFF@state.gov]  
**Sent:** Mon 3/14/2011 7:56 AM

**To:** Shete, Priya  
**Cc:** zTask Force 1 Mailbox  
**Subject:** FW: 2030 Mar 14 - Running Update on Japan Emergency (running file attached)

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**From:** Cipullo, Timothy L

**Sent:** Monday, March 14, 2011 7:53 AM

**To:** Cipullo, Timothy L; Forsberg, Aaron P; Masuda, Tracy L; Dudley, Katherine F; Ou, Andrew H; Sim, Hyon B; Mears, Jeremy M; Lee, Ti-Ying; Ryan, Emmett Jerome; Hotz, Raymond E; Whitney, Thomas C; Chen, Perry Y; Burleson, Edward C; Wakahiro, Gary S; Utschig, Andrew S; Bernier-Toth, Michelle; Fitzgerald, Paul M; Zareski, Karen B; Shelbourn, Brian L; Cubas, Jason R; Christopher, William W; Kaneshiro, Claire K; Greene, Raymond F; Stewart, Jonas D; Ries, John N; Dong, Edward K; Jenks, Darrell A; Washburn, Lisa L; Tokyo-Visa-Officers-DL; Roos, John; Luke, Robert S; Ries, John N; Dong, Edward K; Stewart, Jonas D; Greene, Raymond F; Cubas, Jason R; Fuller, Matthew G; Basalla, Suzanne I; Hinds, Lynda J;

(b)(6); Cherry, Ronald C; Dresser, Heather L (EAP/J); TOKYO POL All; Wood, Robert A; Nawn, Jeff; Angelov, Bonnie A; JapanEmbassy, TaskForce; Kelley, Karen D (IO/Tokyo)

**Cc:** Zumwalt, James P; Chipman, Alan R; Engstrom, Aaron; Forbes, James A; Martin, Timothy W; Rathweg-Weitz, Abbey H; Whitten, Richard V; Young, Joseph M; Operations Center; Young, Joseph M; Lyons, Thomas H; CA-Taskforce; Snider, Marc A; Kaneshiro, Claire K; SES-O; SES-O\_CMS; Lyons, Thomas H; Snider, Marc A; Yoo, Donny H; Tomlinson, Christina; Roberts, Richard M; Kaneshiro, Claire K; Avecilla, Juan T; Chadwick, Michael J; Dieker, Mark S; CA-Taskforce; Ponce, Timothy F; Korff, Meena F; TaskForce-1; CA-Taskforce; Brown, Benjamin A; Wuebbels, Mark C; Osaka-Kobe All State Americans; Sapporo ALL; Naha All; Fukuoka Americans; Nagoya-Americans-DL; Yokohama-FSI-DL; TOKYO ECON Americans; Tilman, Justin E; 'justin.tilman@nasa.gov'; Sakurai, Joy M; Stewart, Bruce J; Sauer, David M;

(b)(6); Morales, Russell A; 'russ@earthtabi.com'; 'lia.hoc@nrc.gov'; (b)(6) Weinhold, Laura M (Jamie); Maw, Aye Aye; Clever, Thomas S (Scott); Japan-Embassy-Task-Force-DL; Huff, Michael P; Kaproth, Robert K; 'Robert.Kaproth@treasury.gov'

**Subject:** 2030 Mar 14 - Running Update on Japan Emergency (running file attached)

1910 March 14, 2001 Monday (GOJ Requests Pump Trucks from USFJ): The Prime Minister passed an urgent request for the US military to provide a truck with capacity to pump water at a high pressure to assist TEPCO at its Fukushima nuclear plant. The Ambassador judges that this should be the number one national priority of support for the USG to the GOJ in the current situation. General Field is aware of the request and is giving it priority consideration.

USFJ/J4 and J5 are in touch with TEPCO points of contact identified by Deputy Chief Cabinet Secretary Kawai.

SBU

This email is UNCLASSIFIED.

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**From:** Kozal, Jason  
**Sent:** Tuesday, April 12, 2011 11:46 AM  
**To:** Kowalczyk, Jeffrey; Billings, Sally  
**Subject:** NLE weekly call in the ready room

Sent from an NRC BlackBerry  
Jason W Kozal

(b)(6)

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**From:** LIA01 Hoc  
**Sent:** Monday, March 14, 2011 6:49 AM  
**To:** RMTPACTSU\_ELNRC  
**Cc:** LIA11 Hoc  
**Subject:** RE: Staff to go to Japan

**Categories:** FOIA

Two locations with our Regulatory Counterparts.

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**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Monday, March 14, 2011 6:47 AM  
**To:** LIA01 Hoc  
**Subject:** RE: Staff to go to Japan

Great, thanks. Do we know who these folks would likely try to meet up with? Thanks.

---

**From:** LIA01 Hoc [mailto:LIA01.Hoc@nrc.gov]  
**Sent:** Monday, March 14, 2011 6:40 AM  
**To:** RMTPACTSU\_ELNRC  
**Cc:** LIA11 Hoc  
**Subject:** Staff to go to Japan

The Chairman has approved sending NRC Staff to Japan. Working on minimum 6 people. We have pinged our Office of Admin folks for dosimetry as well as NAVSEA 08R who helped us get dosimetry before. We're looking for help on transportation to Japan (commercial direct flights are early today and we'd like to get people there ASAP, but can likely not coordinate for 11:20 and 12:20 flights).

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**From:** LIA01 Hoc  
**Sent:** Monday, March 14, 2011 6:46 AM  
**To:** (b)(6); Meyer, David; Schoenmann, Sandra  
**Cc:** LIA11 Hoc  
**Subject:** NRC Staff travel approved  
  
**Categories:** FOIA

The Chairman has approved NRC Staff travel to Japan. Attempting to form team of at least 6 personnel to travel ASAP.

---

**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 6:47 AM  
**To:** RMTPACTSU\_ELNRC  
**Cc:** Kozal, Jason; [REDACTED] (b)(6)  
**Subject:** LT Chron Log  
**Attachments:** LT Chron Log 0314 @ 0700.pdf

Just to keep you in the loop here is the latest.

Beth Reed  
301-816-5208

---

**From:** LIA01 Hoc  
**Sent:** Monday, March 14, 2011 6:33 AM  
**To:** (b)(6)  
**Cc:** LIA11 Hoc  
**Subject:** dosimetry head's up  
  
**Categories:** FOIA

The Japanese Government has officially asked us to consider sending additional NRC Staff to Japan. This is a head's up that there may be a need for more dosimetry. Exact numbers are unknown. At least 6 personnel, provided the Chairman approves this. The Federal Liaison will keep you updated. Likely point of entry would be Narita.

Thank you,  
Bethany Cecere



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**From:** LIA01 Hoc  
**Sent:** Monday, March 14, 2011 6:29 AM  
**To:** Meyer, David  
**Cc:** LIA11 Hoc  
**Subject:** FW: dosimetry head's up

**Categories:** FOIA

Mr. Meyer,

I got the Out-of-Office message from Sandra.

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

Thank you,  
Bethany Cecere

---

**From:** LIA01 Hoc  
**Sent:** Monday, March 14, 2011 6:25 AM  
**To:** Schoenmann, Sandra  
**Cc:** LIA11 Hoc  
**Subject:** dosimetry head's up

The Japanese has asked us to consider sending additional NRC Staff to Japan. This is a head's up that there may be a need for more dosimetry. Exact numbers are unknown. At least 6 personnel, provided the Chairman approves this.

Thank you,  
Bethany Cecere

---

**From:** Watson, Bruce  
**Sent:** Monday, March 14, 2011 6:24 AM  
**To:** LIA11 Hoc  
**Subject:** RE: At Ops Center tonight

(b)(6)

Bruce A. Watson, CHP  
Chief - Reactor Decommissioning Branch  
US Nuclear Regulatory Commission  
Rockville, MD 20852  
301-415-6221 Office

---

**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 5:00 AM  
**To:** Watson, Bruce  
**Subject:** At Ops Center tonight

(b)(6)

working Ops Center tues day as well.

Ted

---

**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 6:05 AM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** RE: GE Experts

**Categories:** FOIA

Tom was aware of the request, but we're scrambling to line up a call right now.

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Monday, March 14, 2011 6:03 AM  
**To:** LIA11 Hoc  
**Subject:** RE: GE Experts

The USAID administrator

---

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Monday, March 14, 2011 6:00 AM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** RE: GE Experts

Who is the 7 am briefing for?

T

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Monday, March 14, 2011 5:59 AM  
**To:** LIA11 Hoc  
**Subject:** RE: GE Experts

Ok thanks. I know its probably unknown at this time, but I could really use specific info on the request for a 0700 briefing here.

---

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Monday, March 14, 2011 5:57 AM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** RE: GE Experts

Japanese Gov't has officially asked for help. ET conference with Jim Trapp ongoing

Ted

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**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Monday, March 14, 2011 4:57 AM  
**To:** LIA11 Hoc  
**Subject:** RE: GE Experts

Great thanks!

---

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Monday, March 14, 2011 4:56 AM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** RE: GE Experts

Talked to RST. They've been talking with GE on and off since Friday on specific issues. There is also a team of GE folks at the Diini (sp?) facility for a refueling outage. We don't know what contact there has been between any Japanese officials and GE Tech experts.

R/

Ted Smith

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**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Monday, March 14, 2011 4:46 AM  
**To:** LIA11 Hoc; LIA01 Hoc  
**Subject:** GE Experts

From an earlier conference call I had, there was discussion about GE tech experts being included in the nuclear response. Would you mind asking the RST if they've heard anything about this? Thanks.

---

**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 4:45 AM  
**To:** (b)(6) RMTPACTSU\_ELNRC  
**Subject:** USNRC Earthquake-Tsunami Update 031411 0430EDT.docx  
**Attachments:** USNRC Earthquake-Tsunami Update 031411 0430EDT.docx  
  
**Categories:** FOIA

Status Report.

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**From:** LIA07 Hoc  
**Sent:** Monday, March 14, 2011 4:44 AM  
**To:** LIA11 Hoc  
**Subject:** status update  
**Attachments:** USNRC Earthquake-Tsunami Update.031411.0430EDT.docx  
  
**Categories:** FOIA

Here you go.

Jim

---

**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 3:16 AM  
**To:** LIA01 Hoc  
**Subject:** SITREP 0313.docx  
**Attachments:** SITREP 0313.docx  
  
**Categories:** FOIA

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**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 1:47 AM  
**To:** (b)(6)  
**Subject:** FW: FYI - Youtube video - Fukushima  
**Categories:** FOIA

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**From:** Weber, Michael  
**Sent:** Saturday, March 12, 2011 12:29 AM  
**To:** LIA05 Hoc  
**Subject:** FYI - Youtube video - Fukushima

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**From:** Franovich, Mike  
**Sent:** Saturday, March 12, 2011 12:27 AM  
**To:** Morris, Scott  
**Cc:** Weber, Michael  
**Subject:** FW: Youtube video - Fukushima

Scott,

Youtube has a video of the waves hitting the plant. It is about 60 percent into the video where they have footage that appears to be date 3/11/11. Yep you will need to forward to your home account to see this video. There is a shorter version of the video if you search on Fukushima Nuclear ECCS. Tied with the aerial shots available on the web showing the damage, you get a sense of the impact.

<http://www.youtube.com/watch?v=8Ea7hTMIw9U>

Mike



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**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Monday, March 14, 2011 8:07 AM  
**To:** Marshall, Jane  
**Subject:** RE: NOC Phase 1 - Awareness 0330-11 Update Report 12 Earthquake-Tsunami - Japan (1800 EDT 13 Mar 11)

Got an answer. When I sent the email, there had been no request and the wording in the NOC report was incorrect. It was only stating that we offered nuclear help. Since early this morning (when Fukushima 1,2,3 degraded), the Japanese have made an official request, but it cannot be made official until it comes through the ambassador (which I believe we just got and are working on the request now). I'm headed back to white flint now. Mike is in a SVTC call for another 45 min.

---

**From:** Marshall, Jane [mailto:Jane.Marshall@nrc.gov]  
**Sent:** Monday, March 14, 2011 7:43 AM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** RE: NOC Phase 1 - Awareness 0330-11 Update Report 12 Earthquake-Tsunami - Japan (1800 EDT 13 Mar 11)  
**Importance:** High

We're getting conflicting reports now on whether or not we really have the official official request for NRC assistance. Can we get this cleared up ASAP? Will also need logistical support for any responders - i.e., travel arrangements, passports, visas...

---

**From:** RMTPACTSU\_ELNRC [RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Monday, March 14, 2011 1:23 AM  
**To:** LIA11 Hoc; LIA01 Hoc  
**Cc:** Grant, Jeffery; Gott, William; Marshall, Jane  
**Subject:** FW: NOC Phase 1 - Awareness 0330-11 Update Report 12 Earthquake -Tsunami - Japan (1800 EDT 13 Mar 11)

All,

I had a request to run down NRC's role in coordinating the 'request for nuclear incident response' as highlighted in the NOC report below. This is clarification from Dept of State, and it is being checked with the DART right now. It sounds like there was not a request for help, but rather help was offered and not yet accepted (confirming our agency has not missed any requests). Please let me know if you need any additional info. Thanks,

Jeff Kowalczyk

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**From:** Shete, Priya  
**Sent:** Monday, March 14, 2011 1:12 AM  
**To:** RMTPACTSU\_RM  
**Cc:** RMTPACTSU\_ELNRC  
**Subject:** RE: NOC Phase 1 - Awareness 0330-11 Update Report 12 Earthquake -Tsunami - Japan (1800 EDT 13 Mar 11)

No one on TF knows about this, nor does the watch. Per the TF coordinator, GoJ has been offered assistance with nuclear incident response but they have not accepted. The TF perspective is that if an ask has occurred, it would have been through the DART so if you have not heard of this, it likely does not exist, especially after recent meetings. If such as request did exist it would be a huge change in the nature of the relationship. I just called over to DHS NOC and sourced this information which appears to have come from a document from State Mil/Pol on 3.11.2011 and is likely from a description of what we offered rather than what was requested. A DHS rep is joining the TF at 0400 EST, I'll ask him if he knows anything further.

Hope this helps,  
Priya

---

**From:** RMTFACTSU\_RM  
**Sent:** Mon 3/14/2011 12:16 AM  
**To:** Shete, Priya  
**Cc:** RMTFACTSU\_ELNRC  
**Subject:** RE: NOC Phase 1 - Awareness 0330-11 Update Report 12 Earthquake -Tsunami - Japan (1800 EDT 13 Mar 11)

Priya,

Can you advise on the first ask below. Jeff, the NRC rep on the RMT, has indicated he's not familiar with this request. I'm checking with the DART as well, but wondering if you have any insight on this from the state side.

Kathleen

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**From:** RMTFACTSU\_ELNRC  
**Sent:** Sunday, March 13, 2011 11:26 PM  
**To:** RMTFACTSU\_RM  
**Subject:** FW: NOC Phase 1 - Awareness 0330-11 Update Report 12 Earthquake -Tsunami - Japan (1800 EDT 13 Mar 11)

FYI

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**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Sunday, March 13, 2011 8:51 PM  
**To:** RMTFACTSU\_ELNRC  
**Subject:** FW: NOC Phase 1 - Awareness 0330-11 Update Report 12 Earthquake -Tsunami - Japan (1800 EDT 13 Mar 11)

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**From:** HOO Hoc  
**Sent:** Sunday, March 13, 2011 7:43 PM  
**To:** LIA01 Hoc; LIA02 Hoc; LIA04 Hoc; LIA07 Hoc; LIA11 Hoc; LIA12 Hoc  
**Subject:** FW: NOC Phase 1 - Awareness 0330-11 Update Report 12 Earthquake - Tsunami - Japan (1800 EDT 13 Mar 11)

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



---

**From:** NOC.SWO.Restricted [mailto:NOC.SWO.Restricted@dhs.gov]  
**Sent:** Sunday, March 13, 2011 6:15 PM  
**Cc:** NOC.SWO.Restricted  
**Subject:** NOC Phase 1 - Awareness 0330-11 Update Report 12 Earthquake - Tsunami - Japan (1800 EDT 13 Mar 11)

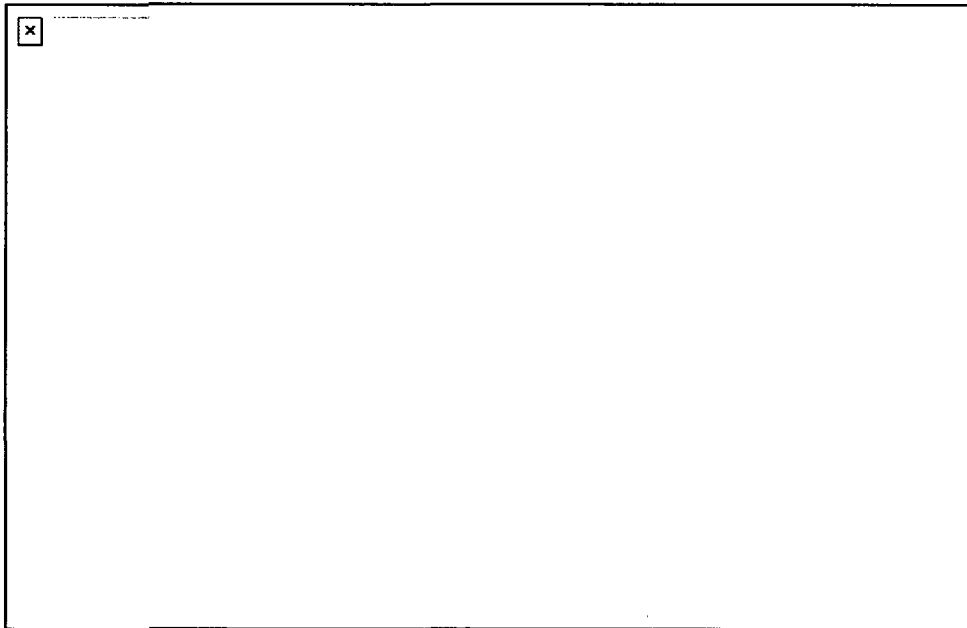
## NOC Phase 1 - Awareness 0330-11 Update Report 12 Earthquake - Tsunami - Japan

**Current:** The Government of Japan (GOJ) made six official requests for US assistance: 1. Nuclear Incident Response; 2. US helicopter "water bucket" operations to cool Fukushima reactors; 3. Urban Search and Rescue (US&R) Teams and rescue dogs (California Task Force 2 and Virginia Task Force 1 US&R Teams have arrived in Misawa), and Department of Defense to take responsibility for US&R along the coast line and in coastal waters); 4. Use of US Air Force bases in Japan; 5. GOJ helicopter landing authorization, medical assistance and refueling on USS RONALD REAGAN; and 6. USS TORTUGA support for transportation of Japan Ground Self-Defense Force (JGSDF) Northern Army from Otaru to Akita. In response to the Fukushima Daiichi Nuclear Power Plant explosion, the GOJ is distributing potassium iodine tablets to impacted population in hopes of reducing health risks. Authorities are attempting to cool the reactor core using chemicals and seawater injection directly into the primary containment vessel. Japan's Nuclear and Industrial Safety Agency reported 160 people exposed to radiation; 170,000 people have been evacuated. US Agency for International Development's (USAID) Response Management Team is working with Disaster Assistance Response Team (DART) to provide clarification on exact meals ready to eat (MRE) requirement. US Customs and Border Protection is sending one attaché to Japan on 15 Mar. Two Nuclear Regulatory Commission (NRC) senior experts have arrived in Japan and are coordinating transfer of information from GOJ to the US Government. NRC is also coordinating with the International Atomic Energy Agency (IAEA). The USS GERMANTOWN, USS TORTUGA, and USS BLUE RIDGE are relocating to Japan with expected arrivals on 13 Mar, 14 Mar, and 18 Mar respectively.

**Future:** The Department of Homeland Security National Operations Center will continue to monitor this event and update as warranted. The next scheduled update report will be published at 0600 EDT, 14 Mar 11.

**Other:** US Geological Survey reported the earthquake moved Japan's main island by about 8 feet.

**Background:** At approximately 0046 EDT, Mar 11, the USGS reported an 8.9 magnitude earthquake occurred off the eastern coast of Honshu, Japan at a depth of 6.2 miles. Tsunami Watches and Warnings were issued for the Pacific region including the west coast of the US.



# DHS Senior Leadership Brief: Earthquake-Tsunami-Japan 1800 EDT 13 Mar 2011

## Current Situation

- 11 Mar, an 8.9 magnitude earthquake occurred 80 miles east of Sendai, Honshu Island, Japan; multiple aftershocks magnitude have been reported.
- **US Geological Survey reported the earthquake moved Japan's main island by about 8 feet.**
- Fukushima 1 or Daiichi Nuclear Power Plant(160 miles north of Tokyo):
  - **The Government of Japan (GOJ) is distributing potassium iodine tablets to the population around the impacted site to help prevent radiation sickness and reduce risks for thyroid disease and cancers.**
  - An explosion occurred in unit 1 at 0136 on 12 Mar.
    - The explosion destroyed the secondary containment building but the reactor pressure vessel and primary containment structure are intact.
    - **Radiation levels outside the reactor are no higher than before the explosion.**
    - **Authorities are attempting to cool the reactor core using chemicals and seawater injection directly into the primary containment vessel.**
    - **Additional water operation measures are underway.**
    - **Containment remains intact; however, radiation levels at the boundary of the site have been reported to be above background.**
    - **Japans' Atomic Energy Agency classified the event as a Level 4 "Accident with Local Consequences" on the International Nuclear and Radiological Event Scale (INES).**
    - **Japan's Nuclear and Industrial Safety Agency reported 160 people were exposed to radiation around the Fukushima nuclear power plant.**
    - The previous evacuation order was extended to a 12-mile (20km) radius of the plant; **170,000 people have been evacuated.**
  - **6 total reactors; 3 are of concern and 3 were shut down prior to the earthquake.**
  - Daiichi Unit 1:
    - **Fuel cladding likely partially melted.**
    - **Reactor pressure vessel and Primary containment structure intact.**
    - **Secondary containment building is breached based on the hydrogen explosion at 0136 EST 12 Mar.**
  - Daiichi Unit 2:
    - The reactor is being maintained shutdown.
    - **Reactor Core Isolation Cooling System is injecting water.**
    - **Reactor water level is lower than normal, but above the top of active fuel and the water level is steady.**
    - **Loss of power resulted in emergency cooling system failure.**
  - Daiichi Unit 3:
    - The reactor is being maintained shutdown; **no offsite power, no emergency diesel generators working.**
    - **Efforts to restart the Reactor Core Isolation Cooling System failed; emergency Core Cooling System flow could not be confirmed.**
    - **Alternative methods to inject water into the core are being investigated.**
    - **Containment sprays used to lower pressure within the reactor containment have been cancelled.**
    - **A reactor pressure vessel manual safety valve was opened to lower the reactor pressure and immediately followed by injection of sea water and boric acid into the reactor core.**
    - **No reactor coolant leakage inside the reactor containment vessel.**
  - Daiichi Unit 4, 5, 6:
    - **These units were shut down prior to the earthquake, and all containments are in tact.**

- The reactor is being maintained shutdown.
  - **Sufficient level of reactor coolant to ensure safety is maintained.**
- A mobile power generator has arrived at the power plant.
- Fukushima 2 or Daini Nuclear Power Plant(150 miles north of Tokyo):
  - **Daini Units 1, 2, 3, 4 shut down.**
  - **Primary containment and secondary containment building are intact.**
  - **A sufficient level of reactor coolant to ensure safety is maintained.**
- Onagawa:
  - **IAEA is reporting the lowest state of emergency has been reported at the Onagawa Nuclear Power Plant.**
    - **Alert was declared as a consequence of radioactivity readings exceeding allowed levels in the area surrounding the plant.**
- Government of Japan (GOJ) has made 6 official requests for assistance:
  - **Nuclear Incident Response.**
  - **US helicopter “water bucket” operations to cool Fukushima reactors.**
    - **Haul water via sling load to support alternate reactor cooling measures.**
  - Search and Rescue Teams and rescue dogs.
    - **California Task Force 2 and Virginia Task Force 1 Urban Search and Rescue (US&R) Teams have arrived in Minsawa.**
    - **1 cargo flight arrived 12 Mar with enough equipment to support the teams.**
    - **A second cargo flight is expected later on 13 Mar.**
  - Usage of US Air Force bases in Japan.
  - **GOJ helicopter landing authorization, medical assistance and refueling on USS RONALD REAGAN; offshore Miyagi coast.**
  - **USS TORTUGA support for transportation of the Japan Ground Self-Defense Force (JGSDF) Northern Army from Otaru to Akita.**

#### Federal Agencies/Departments

- **Federal Emergency Management Agency (FEMA)**
  - Coordinating with US Agency for International Development (USAID) to assist in rescue/life saving efforts.
  - **NRCC deactivated at 1000 EST, 12 March.**
- **Customs and Border Protection (CBP)**
  - **Working if there are plans to initiate evacuation flights or any requests for assistance.**
  - Personnel in the region:
    - **Sending 1 attaché to Japan on 15 Mar.**
    - All personnel in the region accounted for.
- **Immigration and Customs Enforcement (ICE)**
  - All personnel in the region accounted for.
- **National Programs and Protectorate Directorate (NPPD)**
  - **National Cybersecurity & Communications Integration Center**
    - Japan
      - No reports of confirmed breaks on the Asia Pacific Cable Network -2 (APCN-2), Japan-US (JUS), East Asia Crossing (EAC), China to China (C2C) and Southeast Asia/Middle East/Western Europe -3 (SeMeWe-3) undersea cables at this time.
        - **Severe degradation to power production and transmission may cut power to networking equipment resulting in severe congestion due to reduced ability to move traffic.**
        - **DHS OneNet is experiencing degradation of service in various locations in Japan.**
  - **National Infrastructure Coordinating Center (NICC)**

- **National Communications System industry partners report minimal damage to their networks within Japan.**
  - **Various undersea cable systems impacted; owners are inspecting.**
  - **Members of the consortiums for the undersea cables are reporting continued congestion and blocked traffic on undersea cables into Japan.**
    - **Carriers are applying restrictive controls to manage traffic flow in order to maximize call completions.**
  - **Infrastructure Protection is at Phase 1 (awareness).**
  - **The Office of Infrastructure Protection continues to monitor the earthquake effects and reach out to Critical Infrastructure Partners.**
- **Transportation Security Administration (TSA)**
    - Personnel in the region:
      - 1 Transportation Security Officer on vacation in Japan is unaccounted for; all other personnel accounted for.
  - **US Citizenship and Immigration Services (USCIS)**
    - All personnel in the region accounted for.
  - **United States Secret Service (USSS)**
    - All personnel in the region accounted for.
  - **United States Coast Guard (USCG)**
    - All personnel in the region accounted for.
  - **Department of Energy (DOE)**
    - Nuclear Incident Team (NIT) stood up to monitor and create modeling support.
  - **Department of Defense (DoD)**
    - **At GOJ request, DoD will take responsibility for US&R along the coast line and in coastal waters.**
    - **USS RONALD REAGAN executed 6 maritime search and rescue and reconnaissance missions and 20 helicopter missions delivering supplies to ships at sea and 3 towns near Sendai.**
    - **Helicopter assistance missions temporarily suspended following nuclear contamination at higher than anticipated levels.**
      - **The helicopter crew had minor contamination on their hands and feet.**
      - **This level does not pose a risk and it remains unclear where the contamination originated.**
    - **USS GERMANTOWN relocating to Japan; arrival expected 13 Mar.**
    - **USS TORTUGA relocating to Japan; arrival expected 14 Mar.**
    - **USS BLUE RIDGE expected to arrive 18 Mar.**
  - **Department of State (DOS)**
    - **USAID Response Management Team is working with Disaster Assistance Response Team (DART) to provide clarification on exact meals ready to eat (MRE) requirement.**
    - **773 fatalities and 1,442 people missing in Japan; no confirmed fatalities of US citizens.**
    - **An Australian SAR team will arrive 13 Mar at Yokota Air Force Base.**
    - **15 Chinese civilian officials arrived in Japan to conduct SAR operations.**
    - **United Kingdom SAR team, with 63 members, is en route to Misawa.**
    - **Updated Warden Message issued to inform U.S. citizens residing or traveling in Japan that they should notify family and friends of their status.**
  - **United States Nuclear Regulatory Commission**
    - **Deployed 2 nuclear specialists to assist in monitoring and stabilization efforts.**

- The 1 senior expert supporting USAID response efforts arrived, the second is expected 13 Mar.
- Coordinating with the International Atomic Energy Agency.

**National Operations Center**

- Current Posture: Phase 1 - Awareness.

VR,

(b)(6)

Assistant Senior Watch Officer  
National Operations Center  
U.S. Department of Homeland Security  
Unclassified: 202-282-8101  
Secure: 202-447-3547

---

**From:** LIA01 Hoc  
**Sent:** Monday, March 14, 2011 12:33 AM  
**To:** RMTPACTSU\_ELNRC; LIA11 Hoc  
**Subject:** RE: status of Tony & Jim's meeting

**Categories:** FOIA

Got a response from Jim:

-----Original Message-----

**From:** [redacted (b)(6)] [mailto:[redacted (b)(6)]]  
**Sent:** Monday, March 14, 2011 12:32 AM  
**To:** LIA01 Hoc  
**Subject:** Re: meeting postponed Q

We are going to see someone in the Ministry at 2. Also asked to support the Ambassador's press conference at 4. I think we have passed along all the info we have. Busy day.

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Monday, March 14, 2011 12:20 AM  
**To:** LIA11 Hoc; LIA01 Hoc  
**Subject:** status of Tony & Jim's meeting

Tony Ulises and Jim Trapp were supposed to attend a meeting with NISA at 2030, which I was told was postponed. Any word if that's been rescheduled? Thanks!

Jeff



---

**From:** LIA11 Hoc  
**Sent:** Monday, March 14, 2011 12:08 AM  
**To:** (b)(6)  
**Subject:** email address

**Categories:** FOIA

Krista,

I'm on this email account this shift.

Ted

---

**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Sunday, March 13, 2011 11:54 PM  
**To:** LIA11 Hoc  
**Subject:** RE: NRC status update

**Categories:** FOIA

Thanks!

---

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Sunday, March 13, 2011 11:51 PM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** RE: NRC status update

Latest from webeoc

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Sunday, March 13, 2011 11:43 PM  
**To:** LIA11 Hoc; LIA01 Hoc  
**Subject:** NRC status update

The most recent status update I have from WebEOC is from march 13, 1600 edt. Is there a newer one? Thanks!

Jeff

---

**From:** LIA11 Hoc  
**Sent:** Sunday, March 13, 2011 11:47 PM  
**To:** RMPACTSU\_ELNRC  
**Subject:** FW: Fax from 8 13 32245229  
**Attachments:** File1.PDF

**Categories:** FOIA

FYI

(Ted Smith, on shift 11-7p)

-----Original Message-----

From: HOO Hoc  
Sent: Sunday, March 13, 2011 11:37 PM  
To: LIA04 Hoc; LIA02 Hoc; LIA12 Hoc; LIA01 Hoc; LIA11 Hoc; LIA07 Hoc  
Subject: FW: Fax from 8 13 32245229

-----Original Message-----

From: hoo1 [mailto:hoo1.hoc@nrc.gov]  
Sent: Sunday, March 13, 2011 11:35 PM  
To: HOO Hoc  
Subject: Fax from 8 13 32245229

RECEIVE NOTIFICATION FOR JOB 00017682

Notice for: HOO1

Remote ID: 8 13 32245229

Received at: 03/13/2011 23:35

Pages: 1

Routed by:

Routed at: 03/13/2011 23:35

**Young, Joseph M**

---

**From:** CMS TaskForce1D - Deputy Coordinator on behalf of zTask Force 1 Mailbox  
**Sent:** Monday, March 14, 2011 12:05 PM  
**To:** Tokyo PolMil Unit; Japan-Embassy-Task-Force-DL  
**Cc:** zTask Force 1 Mailbox  
**Subject:** FW: Cleared DOD Statement

Laura, per our conversation here is the statement in question. Please convey our intention to release this statement to the GOJ at your earliest opportunity. The PA POC back here on the DC task force is Rainy Young. Best - Todd

**Cleared DOD Statement:**

The U.S. 7th Fleet has temporarily repositioned its ships and aircraft away from the Fukushima Dai-Ichi Nuclear Power Plant after detecting low level contamination in the air and on its aircraft operating in the area. The source of this airborne radioactivity is a radioactive plume released from the Fukushima Dai-Ichi Nuclear Power Plant. For perspective, the maximum potential radiation dose received by any ship's force personnel aboard the ship when it passed through the area was less than the radiation exposure received from about one month of exposure to natural background radiation from sources such as rocks, soil, and the sun. The ship was operating at sea about 100 miles northeast of the power plant at the time. Using sensitive instruments, precautionary measurements of three helicopter aircrews returning to USS Ronald Reagan after conducting disaster relief missions near Sendai identified low levels of radioactivity on 17 air crew members. The low level radioactivity was easily removed from affected personnel by washing with soap and water. They were subsequently surveyed, and no further contamination was detected. As a precautionary measure, USS Ronald Reagan and other U.S. 7th Fleet ships conducting disaster response operations in the area have moved out of the downwind direction from the site to assess the situation and determine what appropriate mitigating actions are necessary. We remain committed to our mission of providing assistance to the people of Japan.

---

**From:** RMTFACTSU\_ELNRC <RMTFACTSU\_ELNRC@ofda.gov>  
**Sent:** Sunday, March 13, 2011 11:17 PM  
**To:** LIA11 Hoc  
**Subject:** RE: CA Brief

**Categories:** FOIA

<http://english.kyodonews.jp/news/2011/03/77484.html>

CNN referenced this plant earlier. Should we follow through with anything regarding this?

---

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Sunday, March 13, 2011 10:57 PM  
**To:** RMTFACTSU\_ELNRC  
**Subject:** RE: CA Brief

Thanks, we haven't heard anything about this site.

---

**From:** RMTFACTSU\_ELNRC [mailto:RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Sunday, March 13, 2011 10:49 PM  
**To:** LIA11 Hoc  
**Subject:** RE: CA Brief

And I just realized why the 4<sup>th</sup> site isn't on TEPCO, its owned by JAPC (<http://www.japc.co.jp/english/index.html>).

---

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Sunday, March 13, 2011 10:42 PM  
**To:** RMTFACTSU\_ELNRC  
**Subject:** RE: CA Brief

To join the call dial  passcode  #.

ET was just telling Jim (in Japan) it was another steam venting incident, the reactor building partially collapsed but the reactor is not damaged. At least that is what it appears like from live news feed from NHK TV. This was similar to what happened to Unit 1 yesterday.

---

**From:** RMTFACTSU\_ELNRC [mailto:RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Sunday, March 13, 2011 10:36 PM  
**To:** LIA11 Hoc  
**Subject:** RE: CA Brief

No could you pass on the number? And yes I saw the news clip on the explosion. Do we have any updated info on the Fukushima 1 and 3 plants? And FYI there's a new tsunami warning.

---

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Sunday, March 13, 2011 10:28 PM

**To:** RMTPACTSU\_ELNRC  
**Subject:** RE: CA Brief

Yes, do you have the number?

Also, the news is showing Unit 3 just exploded, but it looks like steam release and not an explosion.

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Sunday, March 13, 2011 10:25 PM  
**To:** LIA11 Hoc  
**Subject:** CA Brief

Still on for 2330? Thanks!

---

**From:** LIA11 Hoc  
**Sent:** Sunday, March 13, 2011 7:40 PM  
**To:** RMTPACTSU\_ELNRC  
**Cc:** [REDACTED]; Kozal, Jason  
**Subject:** Embassy Meeting

The meeting that Jim Trapp was to attend at 2030 at the Embassy has been canceled. The 2330 CA briefing is still on.

Beth

---

**From:** CMS TaskForce1G - USAID <1TFG@state.gov>  
**Sent:** Sunday, March 13, 2011 6:59 PM  
**To:** LIA11 Hoc  
**Cc:** zTask Force 1 Mailbox  
**Subject:** RE: NRC Press Release

**Categories:** FOIA

Excellent. Thank you.

-Bryan

---

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Sunday, March 13, 2011 6:58 PM  
**To:** TaskForce-1  
**Subject:** NRC Press Release

Brian this is the most current Press Release from the NRC. You can also access these press releases on our website at <http://www.nrc.gov/>.

Please let me know if I can help with anything else.

Beth Reed  
NRC Federal Liaison Desk  
301-816-5208





# 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](mailto:opa.resource@nrc.gov) Site: [www.nrc.gov](http://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.

###

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](http://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:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Sunday, March 13, 2011 6:40 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA08 Hoc; Gott, William; Harrington, Holly; McIntyre, David  
**Subject:** USART RAD Monitoring Plan  
**Attachments:** Radiation Monitoring Plan.docx  
  
**Categories:** FOIA

FYI

---

**From:** RMTPACTSU\_DMO  
**Sent:** Sunday, March 13, 2011 6:33 PM  
**To:** RMTPACTSU\_ELNRC; RMTPACTSU\_HHS  
**Cc:** RMTPACTSU\_SRO  
**Subject:** FW: Fwd: RAD Monitoring Plan

Hey guys,

Attached is the Radiation Monitoring Plan that the USAR teams put together. Your feedback is welcome!

Thanks!

Chris

**From:** Perks, Dewey(DCHA/OFDA) [mailto:dperks@usaid.gov]  
**Sent:** Sunday, March 13, 2011 5:01 PM  
**To:** DART\_PACTSU  
**Cc:** RMTPACTSU\_DMO; RMTPACTSU\_DMP; Bardwell, Shawn(DCHA/OFDA) [USAID]  
**Subject:** Fw: Fwd: RAD Monitoring Plan

Developed last evening...USAR Safety Message being finalized

---

**From:** USA Task Force 2 Los Angeles County Fire Department <usa.tf2@gmail.com>  
**To:** Perks, Dewey(DCHA/OFDA); fairfaxjapan2011@gmail.com <fairfaxjapan2011@gmail.com>  
**Sent:** Sun Mar 13 16:58:57 2011  
**Subject:** Fwd: RAD Monitoring Plan  
Dewey,

Attached is the Radiation Monitoring Plan.

TEwald

see attached rad

## Radiation Monitoring Plan

- Radiation monitoring to record any exposure to radiation has begun and will continue throughout the incident.
- Each squad has a hazmat member imbedded who will wear a PRD to measure that squads exposure.
- Hazmat members will record the dosimeter readings daily. The dosimeters will not be re-zeroed, so we will keep a record of total accumulated dose during the deployment.
- No one should go on an independent assignment unless accompanied by a hazmat member with a PRD, or unless wearing a PRD.
- The dosimeters have a low level alarm that warns of exposure above background. This low level alarm is at a level considered SAFE. Action required is to notify a Hazmat manger and continue to monitor the rate and dose readings. Exclusion, (initial No Go perimeter) will be established at 2mR per hour.
- In the event of sudden unexpected activation of High rate alarm, personnel should wash or wipe face, don a mask, and withdraw to an area at least below the alarm threshold of 2R/ hour. After withdrawing, notify Hazmat Managers, wash hands and face and await further decon instructions.

Canberra PRD alarm settings:

| R    | Low Setting    | High Setting |
|------|----------------|--------------|
| Rate | 500 $\mu$ R/hr | 2 R/hr       |
| Dose | 100 mR/hr      | 10R          |

EPA recommended exposure limits

| Exposure Limit (REM) | Exposure Limit (milliREM) | Activity                              |
|----------------------|---------------------------|---------------------------------------|
| 0.5                  | 500                       | Annual public exposure limit          |
| 5                    | 5,000                     | Annual occupational exposure limit    |
| 10                   | 10,000                    | Protect property or mitigate incident |
| 25                   | 25,000                    | Lifesaving exposure limit*            |

---

**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Sunday, March 13, 2011 6:37 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; LIA08 Hoc  
**Subject:** RMT schedule  
**Attachments:** RMT\_Pacific Tsunami Schedule Mar.xls; PAC TSU Response Org Charts\_03 13 2011.pptx  
**Categories:** FOIA

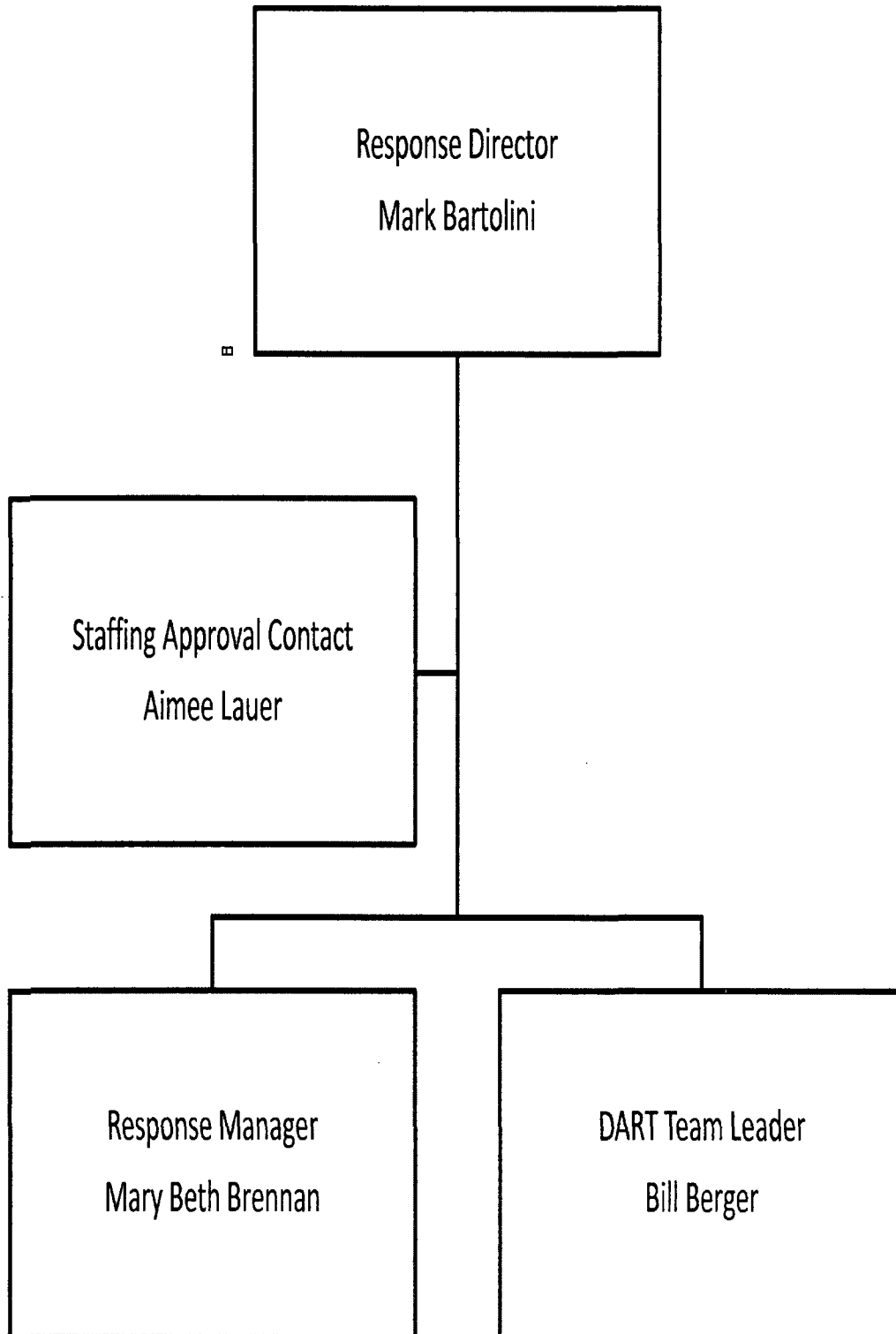
Dear RMT members,

Attached please find the draft RMT schedule for next week along with a copy of the org charts. We will re-evaluate weekend hours later in the week based on the volume of work.

Please send me any corrections.

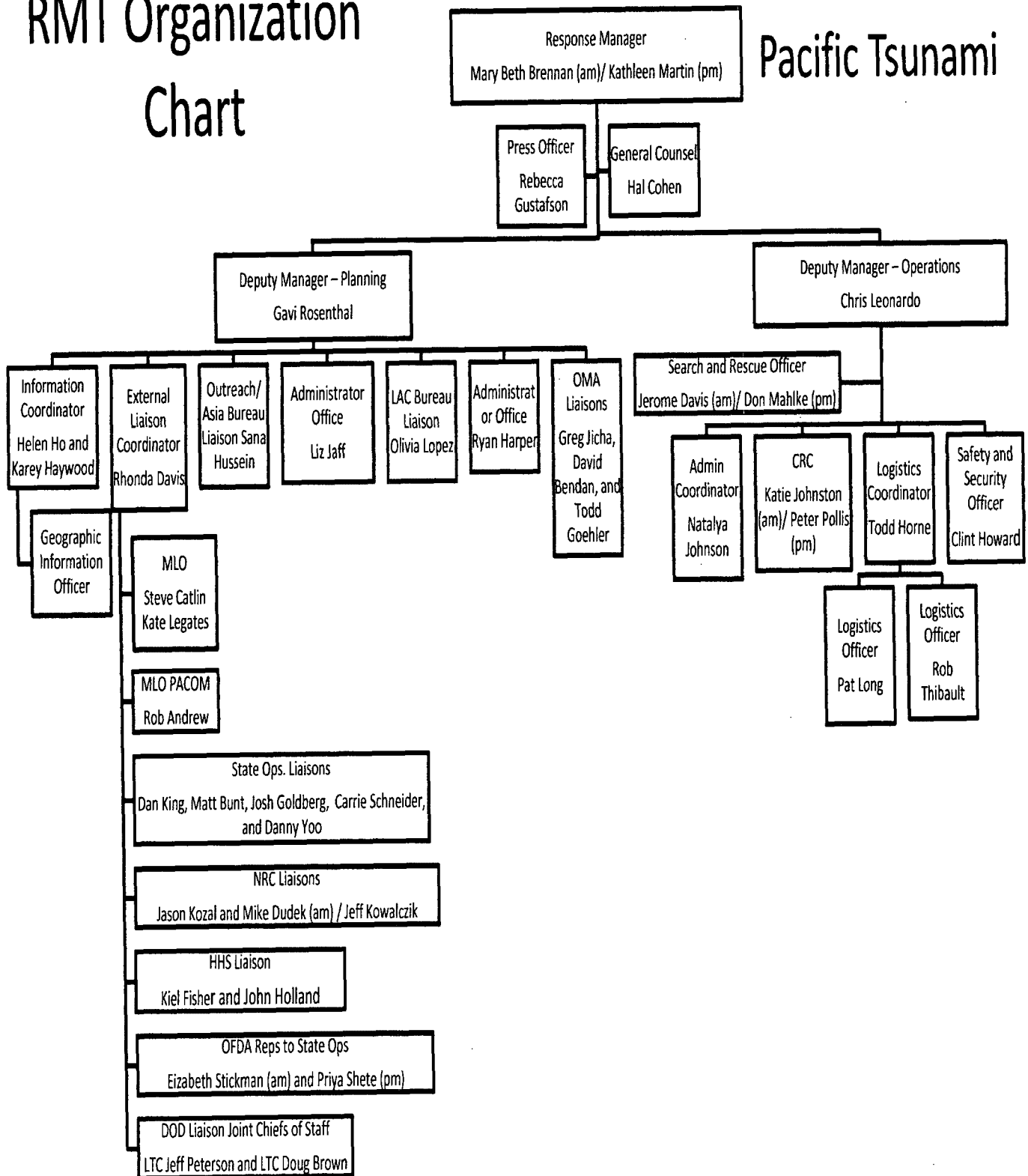
Chris Leonardo  
Deputy Manager for Operations  
Pacific Tsunami Response Management Team  
[RMTPACTSU\\_DMO@ofda.gov](mailto:RMTPACTSU_DMO@ofda.gov)  
202-712-0039

# Pacific Tsunami Response - Senior Management

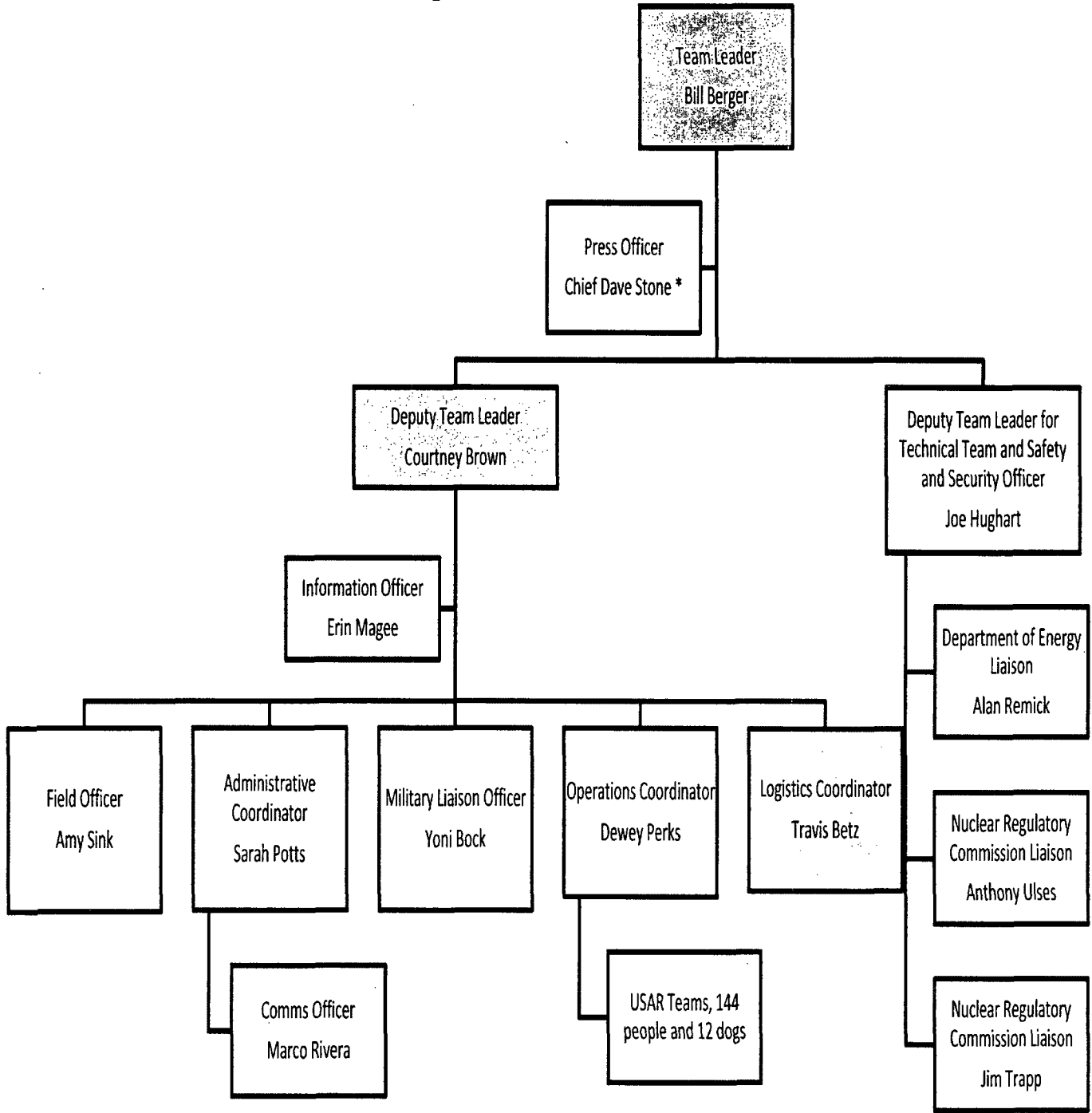


# RMT Organization Chart

## Pacific Tsunami



# Pacific Tsunami - DART Organization Chart



\* Does not count against DART total, captured under USAR









































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**From:** CMS TaskForce1G - USAID <1TFG@state.gov>  
**Sent:** Sunday, March 13, 2011 6:37 PM  
**To:** LIA11 Hoc  
**Cc:** zTask Force 1 Mailbox  
**Subject:** RE: SITREP NRC

**Categories:** FOIA

Many thanks!

Bryan Schiller  
Office of Weapons of Mass Destruction Terrorism  
Bureau of International Security and Nonproliferation  
U.S. Department of State

---

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Sunday, March 13, 2011 6:35 PM  
**To:** TaskForce-1  
**Subject:** SITREP NRC

As requested

Beth Reed  
NRC Federal Liaison Desk  
301-816-5208

---

**From:** LIA11 Hoc  
**Sent:** Sunday, March 13, 2011 6:25 PM  
**To:** RMTPACTSU\_ELNRC; LIA01 Hoc; LIA07 Hoc  
**Cc:** Gott, William; Marshall, Jane; Grant, Jeffery; (b)(6)  
**Subject:** RE: ET Priorities

I have checked around and the only briefing that is schedule in at 2330 and that is the CA Brief. The HOO has no other request for phone bridges to support a briefing, and the ET chronologist knows of no other briefing. To join the call dial (b)(6), passcode (b)(6)#.

Jim Trapp will be calling in around 8:30, and there might be a briefing after that, but no one is sure right now. I'll let you all know if there is a briefing following that call.

Beth

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Sunday, March 13, 2011 6:00 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc  
**Cc:** Gott, William; Marshall, Jane; Grant, Jeffery; (b)(6)  
**Subject:** RE: ET Priorities

Thanks Beth much appreciated.

---

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Sunday, March 13, 2011 6:00 PM  
**To:** RMTPACTSU\_ELNRC; LIA01 Hoc; LIA07 Hoc  
**Cc:** Gott, William; Marshall, Jane; Grant, Jeffery; (b)(6)  
**Subject:** RE: ET Priorities

RMT,

Since the NRC is not in response mode there are no actual response priorities, however the objectives for this shift are:

Revised most recent press release and send out update  
Continue revising Q&A document to be responsive to stakeholder inquiries  
Be in position to provide technical assistance upon request

There is a CA brief at 2330 tonight, I'll get you the specifics and information on all other briefings.

Beth

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Sunday, March 13, 2011 5:34 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc  
**Cc:** Gott, William; Marshall, Jane; Grant, Jeffery; (b)(6)  
**Subject:** ET Priorities

Folks,

Is the ET setting priorities for the NRC response and the teams, if so can we be looped into it. It would be good for us to reference. Additionally, is there a CA briefing currently scheduled for tonight. If so please let us know of it and any subsequent briefings that come up going forward.

Thanks,

The RMT (Mike, Jason, and Jeff)

---

**From:** LIA11 Hoc  
**Sent:** Sunday, March 13, 2011 6:15 PM  
**To:** Anderson, Joseph  
**Cc:** 'vanessa.quinn@dhs.gov'  
**Subject:** RE: List of Federal Agency  
**Attachments:** Current Situation Report - Magnitude 8.9 Earthquake in Japan - 13 Mar 11 (Update 6).pdf

**Categories:** FOIA

I know of no such list, and I have asked around and no one recalls sending out such a list. However, according to DHS SITREP #6 (see attached) the NRCC State Department Liaison is on 24/7 availability in an on-call capacity. I would think the NRCC would have the contact information for the State Department.

Beth Reed  
NRC Federal Liaison  
301-816-5208

---

**From:** Anderson, Joseph  
**Sent:** Sunday, March 13, 2011 6:03 PM  
**To:** LIA11 Hoc  
**Cc:** 'vanessa.quinn@dhs.gov'  
**Subject:** Fw: List of Federal Agency

Are you aware of this list that we can forward to FEMA HQ REP (Vanessa Quinn)?

---

**From:** Quinn, Vanessa <Vanessa.Quinn@dhs.gov>  
**To:** Sherwood, Harry <harry.sherwood@dhs.gov>; Ralston, Michelle <Michelle.Ralston@dhs.gov>; Anderson, Joseph  
**Sent:** Sun Mar 13 16:54:47 2011  
**Subject:** List of Federal Agency

There was a list that came out on Friday listing some of the Federal Department and Agencies -- it had a contact for the State department. Do you have that list?

Vanessa E. Quinn  
Branch Chief, REP Program  
Technological Hazards Division  
National Preparedness Directorate  
DHS/FEMA



# National Infrastructure Coordinating Center

## Current Situation Report

### Magnitude 8.9 Earthquake 80 miles offshore Northeastern Japan - 13 Mar 11 (Update 6)

|                                                                                                                |                                                                                              |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <b>Date:</b> 03/13/2011 12:00:00                                                                               | <b>Incident Location:</b> Honshu, Japan                                                      |
| <b>Incident Start Time:</b> 03/11/2011 01:25:00<br><b>Incident End Time:</b> Ongoing                           | <b>Sitrep Update Version:</b> Update #6                                                      |
| <b>Impacted Sectors:</b> Emergency Services, Nuclear Reactors, Materials & Waste                               | <b>Reported Cause of Incident:</b> Earthquake                                                |
| <b>Interagency Coordination:</b> N/A                                                                           | <b>On Scene Agencies:</b> USGS, DHS, DOT, DOD, DOS                                           |
| <b>Owner/Operator(s) Involved:</b> Onagawa, Fukushima Dai-ichi, and Fukushima-Daini Nuclear Facilities - Japan | <b>Source of Information:</b> Nuclear SSA, Energy SSA, NOAA, FEMA-NRCC, NCS-NCC, Open Source |

#### Incident Summary:

As of 13 Mar at 1200 EDT, the NICC Watch has received the following reports regarding the Japanese 8.9 Earthquake/Tsunami, which occurred on 11 Mar at 0125 EST:

As of 12 Mar at 1000 EST, the National Response Coordination Center (NRCC) has transitioned to Level IV (Watch/Steady State). The NRCC Activation Team State Department Liaison and Department of Energy Liaison will maintain at 24/7 availability in an on-call capacity.

As of 12 Mar at 1110 EST, the National Oceanic and Atmospheric Administration - National Weather Service has cancelled the last remaining Tsunami Advisory for Northern California and no Tsunami watches, warnings, or advisories remain in effect for U.S. states or territories.

National Communications System - National Coordinating Center reports that due to the 8.9 earthquake in Japan, multiple sites in the Pacific Rim have lost network connectivity to DHS OneNet. Fourteen sites restored network connectivity; network restoration efforts are ongoing for the remaining affected sites.

The Office of Infrastructure Protection Nuclear Sector-Specific Agency (SSA) has provided the following information from the International Atomic Energy Agency (IAEA):

Japanese authorities have informed the IAEA that the explosion at the Unit 1 reactor at the Fukushima Daiichi plant occurred outside the primary containment vessel (PCV), and not inside. The plant operator, Tokyo Electric Power Company (TEPCO), has confirmed that the integrity of the primary containment vessel remains intact. As a countermeasure to limit damage to the reactor core, TEPCO proposed that sea water mixed with boron be injected into the primary containment vessel. This measure was approved by Japan's Nuclear and Industrial Safety Agency (NISA) and the injection procedure has begun.

NISA has confirmed the presence of cesium-137 and iodine-131 in the vicinity of Fukushima Daiichi Unit 1. NISA reported an initial increase in levels of radioactivity around the plant on 12 Mar, but those levels have declined. Containment remains intact at Fukushima Daiichi Units 1, 2 and 3.

~~Third Agency dissemination of this report is prohibited without prior DHS approval. Please address requests for further distribution, questions, or comments to the NICC via telephone 202-282-9201 or email [NICC@dhs.gov](mailto:NICC@dhs.gov).~~

This information is based on initial reporting and is being provided for your situational awareness. Initial reporting may have inaccuracies due to a rapidly developing situation and is subject to change.



## National Infrastructure Coordinating Center

### Current Situation Report

Evacuations around both affected nuclear plants have begun. In the 12-mile radius around Fukushima Daiichi an estimated 170,000 people have been evacuated. In the 6-mile radius around Fukushima Daini an estimated 30,000 people have been evacuated. Full evacuation measures have not been completed.

The Japanese authorities have classified the event at Fukushima Daiichi Unit 1 as a level 4 'Accident with Local Consequences' on the International Nuclear and Radiological Event Scale (INES). The INES scale is used to promptly and consistently communicate to the public the safety significance of events associated with sources of radiation. The scale runs from 0 (deviation) to 7 (major accident). Japan has also confirmed the safety of all its nuclear research reactors. The IAEA continues to liaise with the Japanese authorities and is monitoring the situation as it evolves.

The U.S. Nuclear Regulatory Commission (NRC) has deployed experts to Japan as part of a U.S. Government (USG) response. Two officials from the NRC with expertise in boiling water nuclear reactors have deployed to Japan as part of a U.S. Agency for International Development team.

The Nuclear SSA continues to provide additional relevant updates regarding this incident upon further coordination with its Nuclear Government Coordinating Council point of contact at the Department of State - Office of Nuclear Energy, Safety and Security, as additional information becomes available.

The Energy (Electric) SSA reports that the National Nuclear Security Administration has stood up a Nuclear Incident Team in the Department of Energy's Emergency Operations Center. The United States did not sustain any impacts to its energy infrastructure from the tsunami.

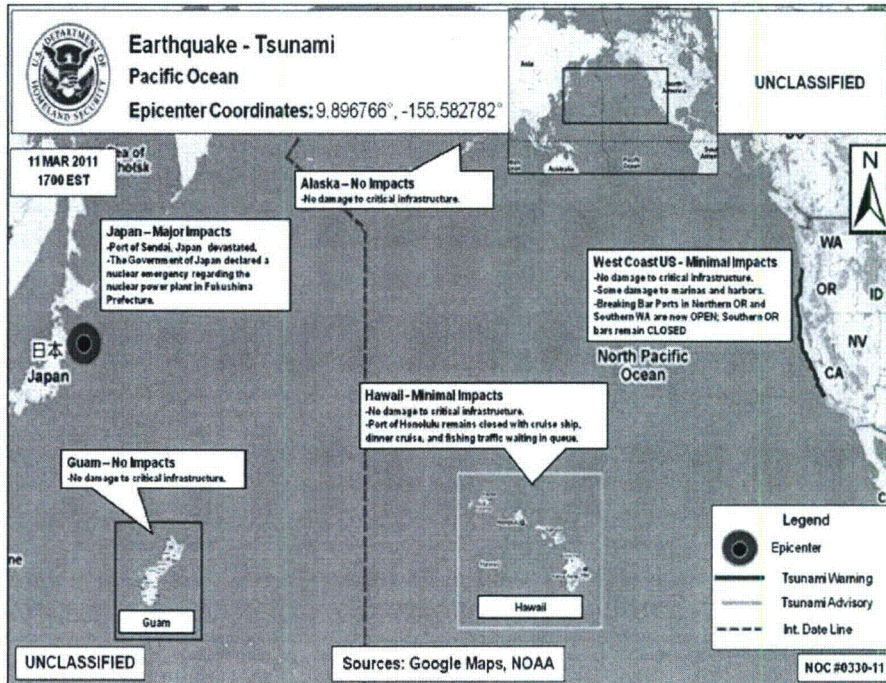
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This information is based on initial reporting and is being provided for your situational awareness. Initial reporting may have inaccuracies due to a rapidly developing situation and is subject to change.



# National Infrastructure Coordinating Center

## Current Situation Report



Third Agency dissemination of this report is prohibited without prior DHS approval. Please address requests for further distribution, questions, or comments to the NICC via telephone 202-282-9201 or email [NICC@dhs.gov](mailto:NICC@dhs.gov).

This information is based on initial reporting and is being provided for your situational awareness. Initial reporting may have inaccuracies due to a rapidly developing situation and is subject to change.

---

**From:** LIA11 Hoc  
**Sent:** Sunday, March 13, 2011 5:01 PM  
**To:** LIA08 Hoc  
**Subject:** FW: Briefing Package

**Categories:** FOIA

---

**From:** RMTFACTSU\_ELNRC [mailto:RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Sunday, March 13, 2011 4:51 PM  
**To:** LIA07 Hoc; LIA11 Hoc; LIA01 Hoc  
**Cc:** Marshall, Jane; Gott, William; Grant, Jeffery; [redacted (b)(6)]; Kozal, Jason  
**Subject:** RE: Briefing Package

Thanks for the info Sara. WE have Jeff Kowalczyk overnight tonight. We are good. For everyone's info we are going to staff the NRC liaison position as follows:

0645 – Dudek to USAID, Kozal to OPS Center for Brief and de-brief  
0830 – Kozal to USAID  
1700 - Dudek to NRC ops center for briefing and de-brief  
1845 – Kowalczyk to USAID  
1930 – Kozal Depart USAID

Mike and I good for coverage going forward. We will see about Jeff tonight and let everyone know. FYI there is a lot of activity here and a significant amount on the back shift due to the +13 hour time difference.

---

**From:** LIA07 Hoc [mailto:LIA07.Hoc@nrc.gov]  
**Sent:** Sunday, March 13, 2011 4:46 PM  
**To:** RMTFACTSU\_ELNRC; LIA11 Hoc; LIA01 Hoc  
**Cc:** Marshall, Jane; Gott, William; Grant, Jeffery; [redacted (b)(6)]; Kozal, Jason  
**Subject:** RE: Briefing Package

Per Brian:

There is an 0830 (Japan time) briefing with the Japanese technical authority. Jim and Tony will be present at the briefing and they will be trying to get better information and assessments of the Japanese reactors.

Fukushima Daiishi:

Unit 1 – positive progress with the water level

Unit 2 – ok

Unit 3 – adding water to the core

Also, Milt wants to know what your coverage is like for tonight. Do we need to send someone down there?

-Sara

---

**From:** RMTFACTSU\_ELNRC [mailto:RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Sunday, March 13, 2011 4:32 PM  
**To:** LIA07 Hoc; LIA11 Hoc; LIA01 Hoc  
**Cc:** Marshall, Jane; Gott, William; Grant, Jeffery; [redacted (b)(6)]; Kozal, Jason  
**Subject:** RE: Briefing Package



This is good but we need more detail on the activities of Jim and Tony. They are technically under the Administrators authority and he has communicated to us that he would like to know their specific interactions.

---

**From:** LIA07 Hoc [mailto:LIA07.Hoc@nrc.gov]  
**Sent:** Sunday, March 13, 2011 4:30 PM  
**To:** RMTPACTSU\_ELNRC; LIA11 Hoc; LIA01 Hoc  
**Cc:** Marshall, Jane; Gott, William; Grant, Jeffery; [redacted (b)(6)]; Kozal, Jason  
**Subject:** RE: Briefing Package

Would the attached work for you?  
I'll send a BWR diagram over too ... but that will be from a different computer.  
-Sara

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Sunday, March 13, 2011 4:12 PM  
**To:** LIA11 Hoc; LIA07 Hoc; LIA01 Hoc  
**Cc:** Marshall, Jane; Gott, William; Grant, Jeffery; [redacted (b)(6)]; Kozal, Jason  
**Subject:** Briefing Package

Federal Liaison (is it just you Beth?),

The Administrator of USAID has requested a briefing from the interagency at 2100 tonight. We need a quick briefing package on the following topics:

General status of the Japanese power plants, specifically areas of concern for the NRC and Japanese. A simplified diagram of a BWR for demonstration would be good. Additionally basic information on radiation would be helpful.

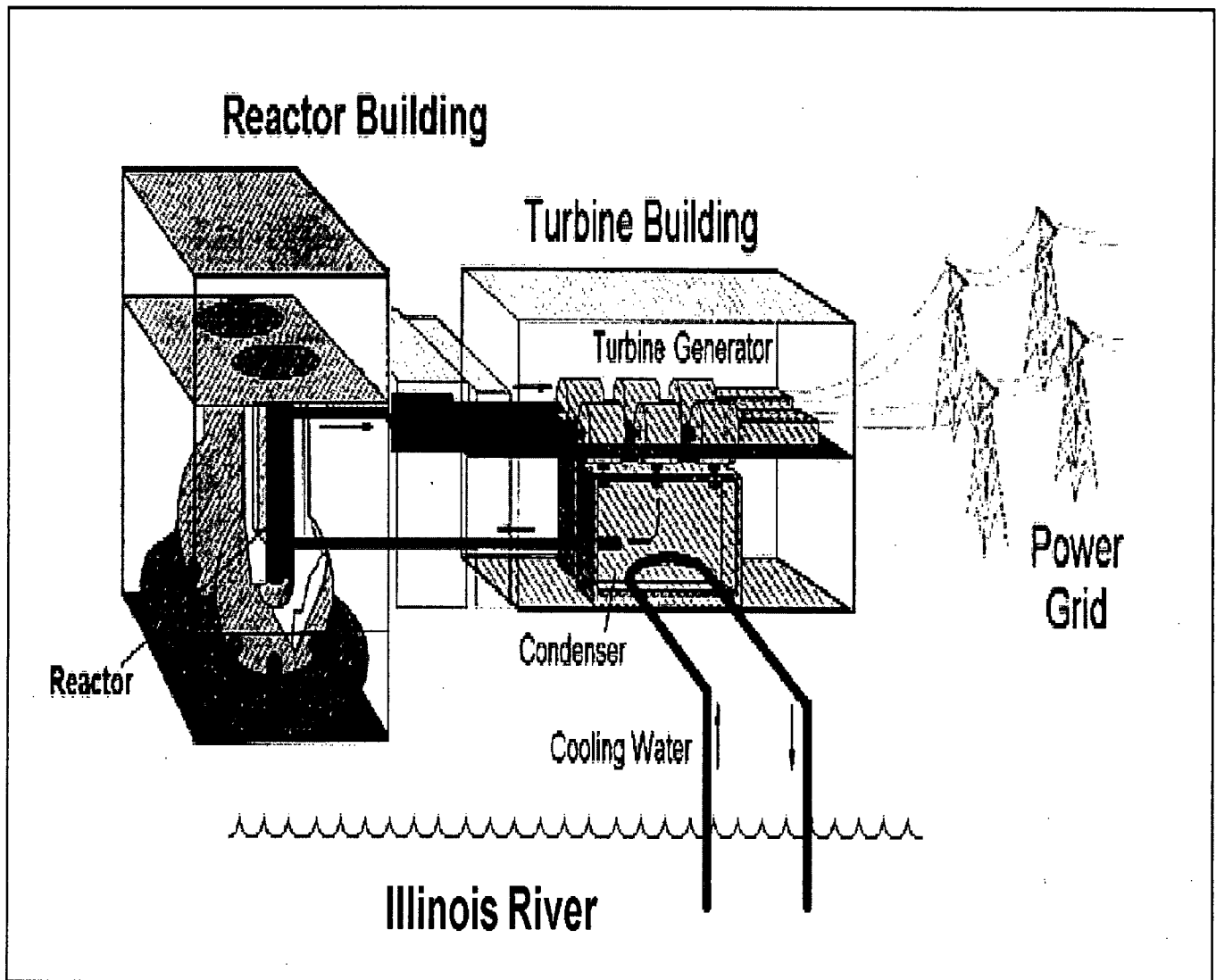
The locations of Jim Trapp and Tony Ulses, what meetings they have had with the Japanese Government the utility. What meetings they plan in the near future (I heard on the CA brief that Jim T was meeting with the Japanese around 2000 EDT).

And most importantly for each of these topics: The bottom line first.

Let me know if there are any problems with this.

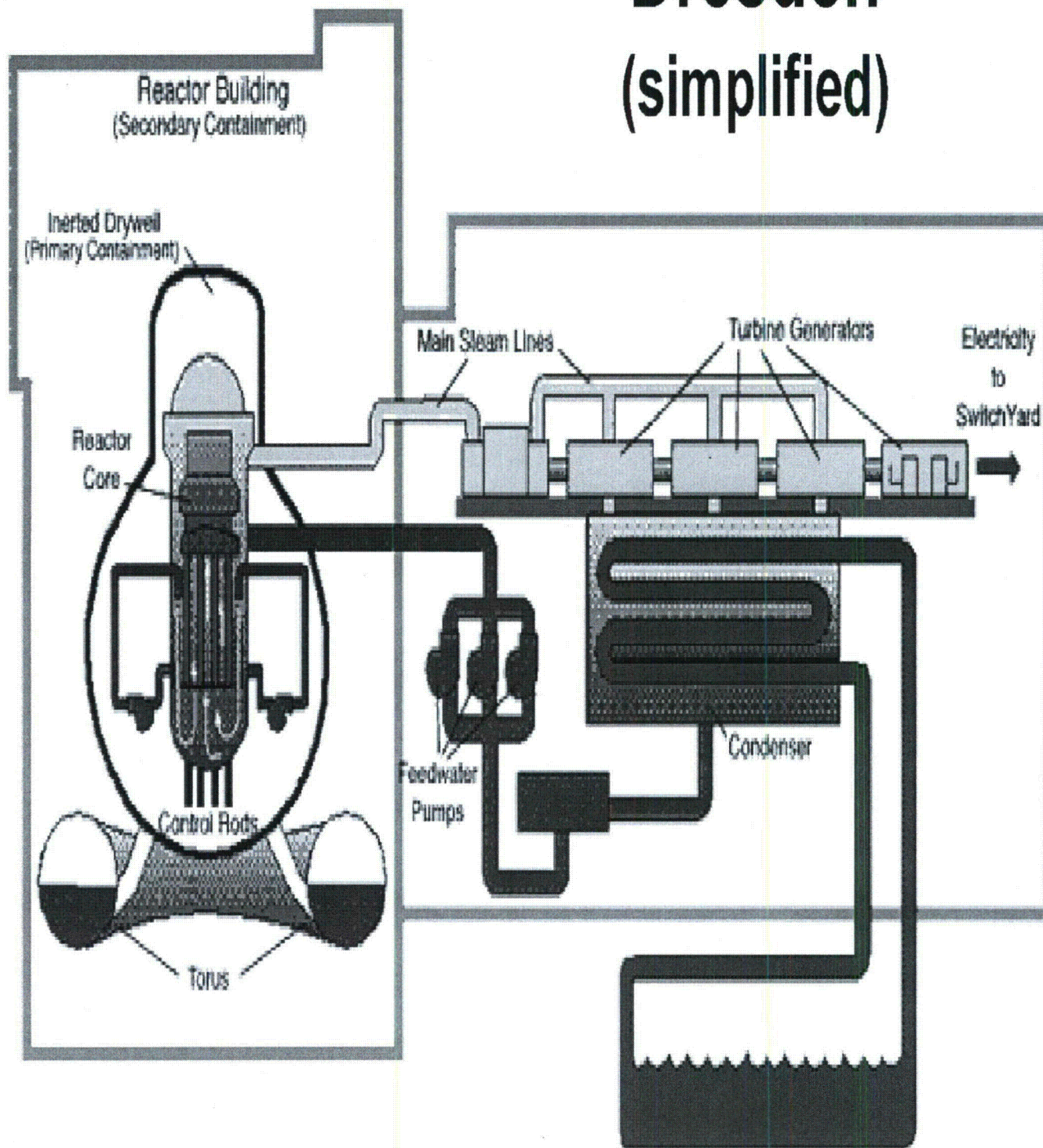
Jason

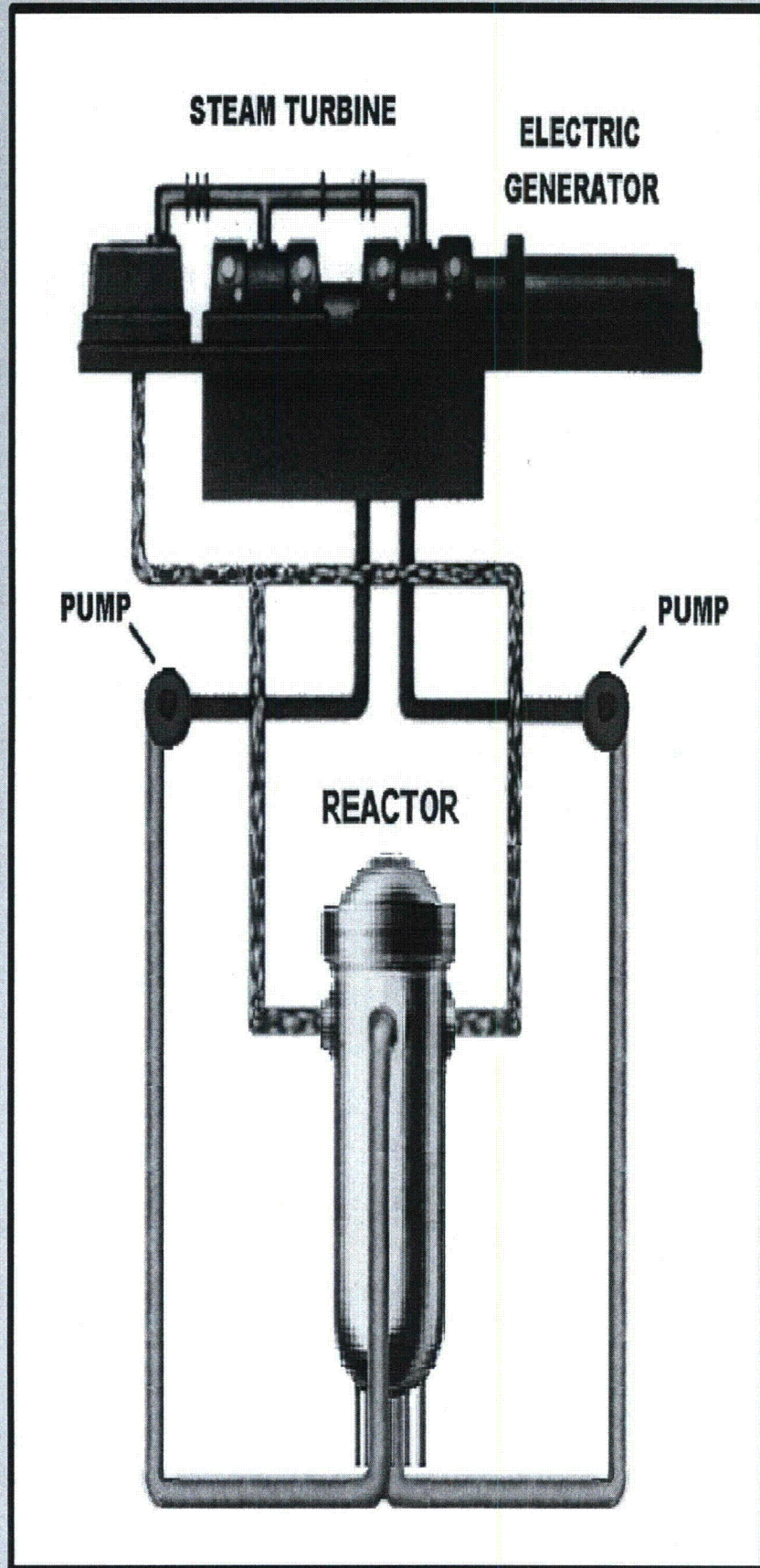
# Dresden (simplified)



# Boiling Water Reactor

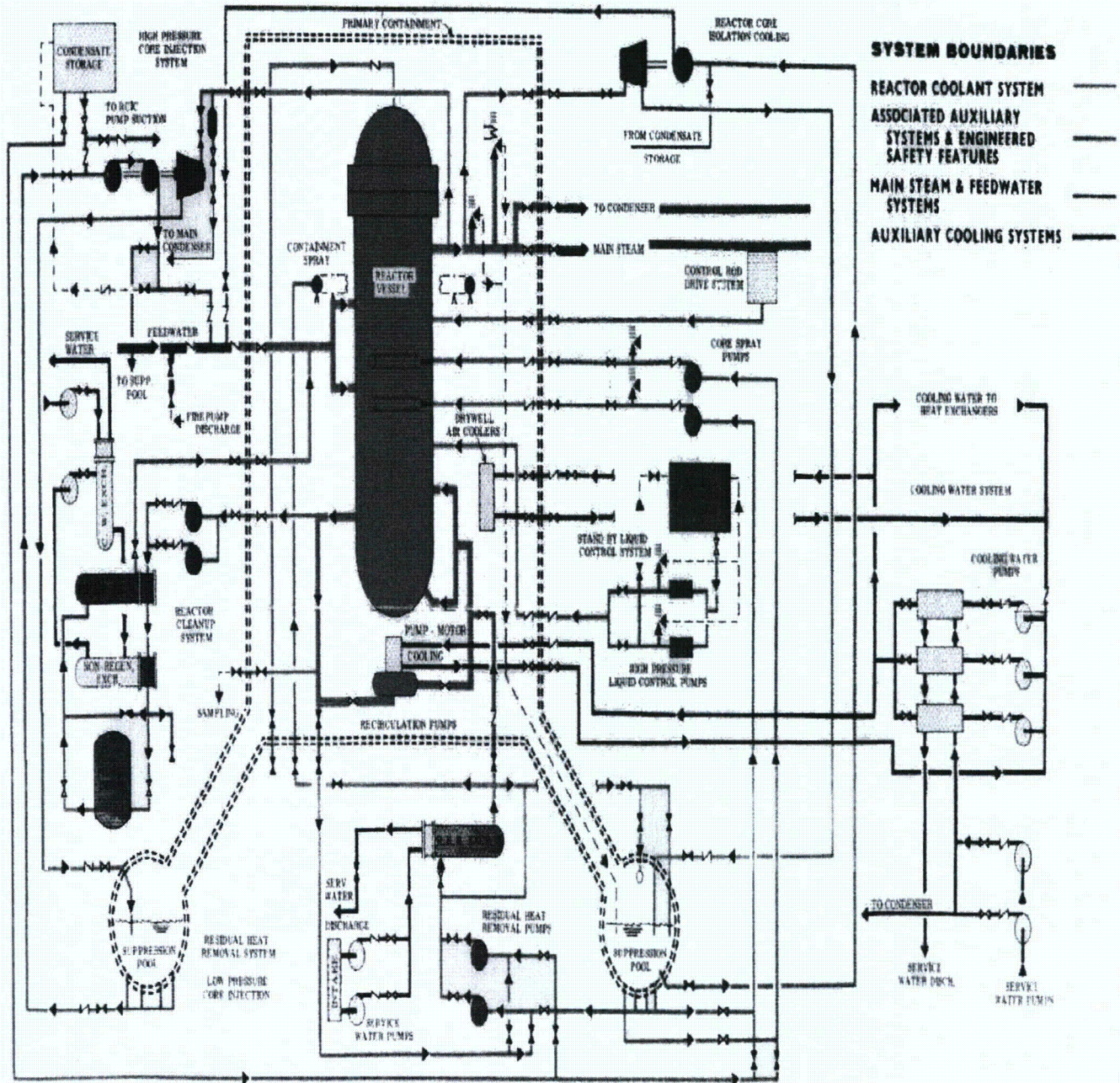
# Dresden (simplified)





# BWR Nuclear Steam Supply System

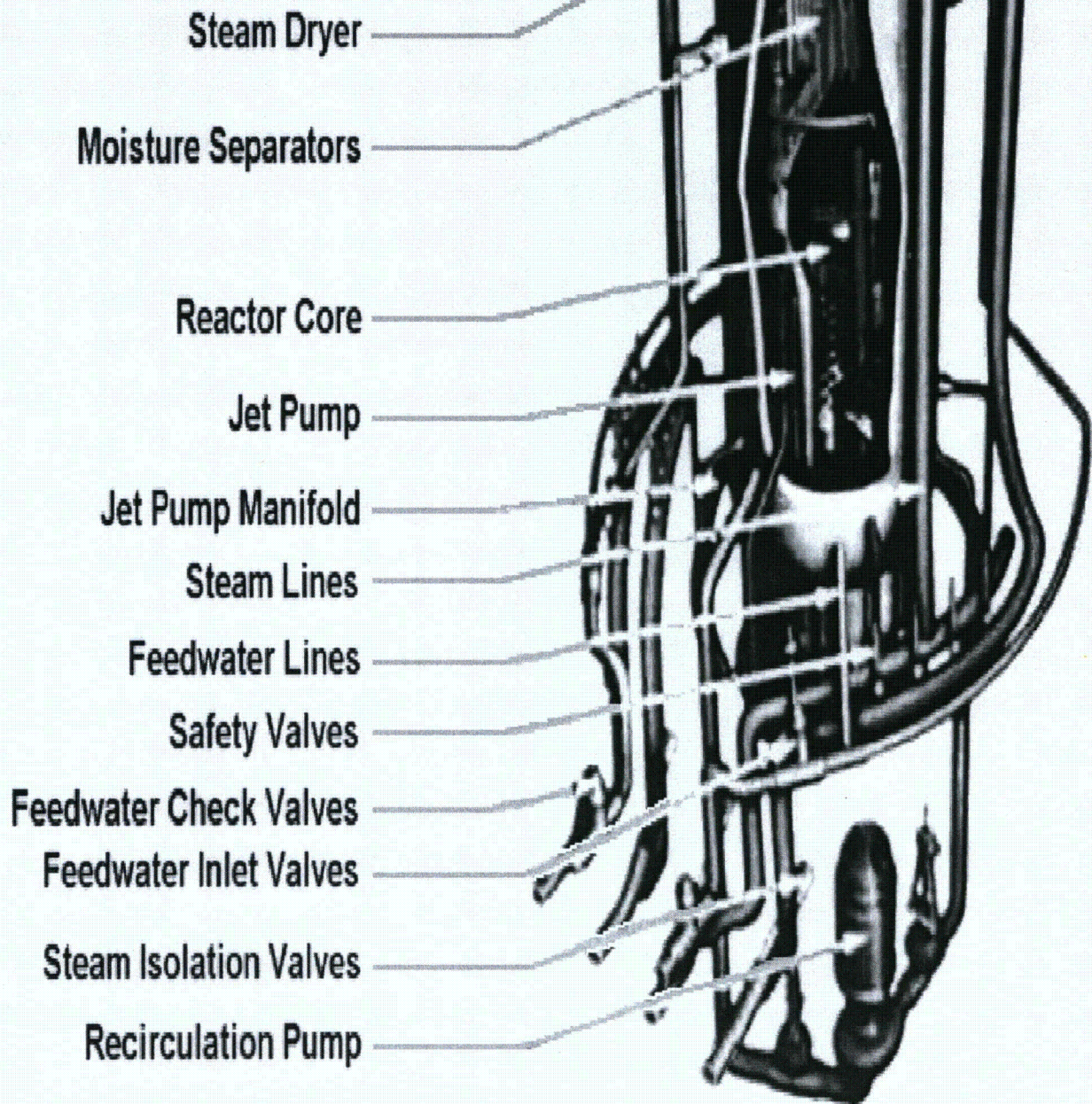
# Typical General Electric Boiling Water Reactor





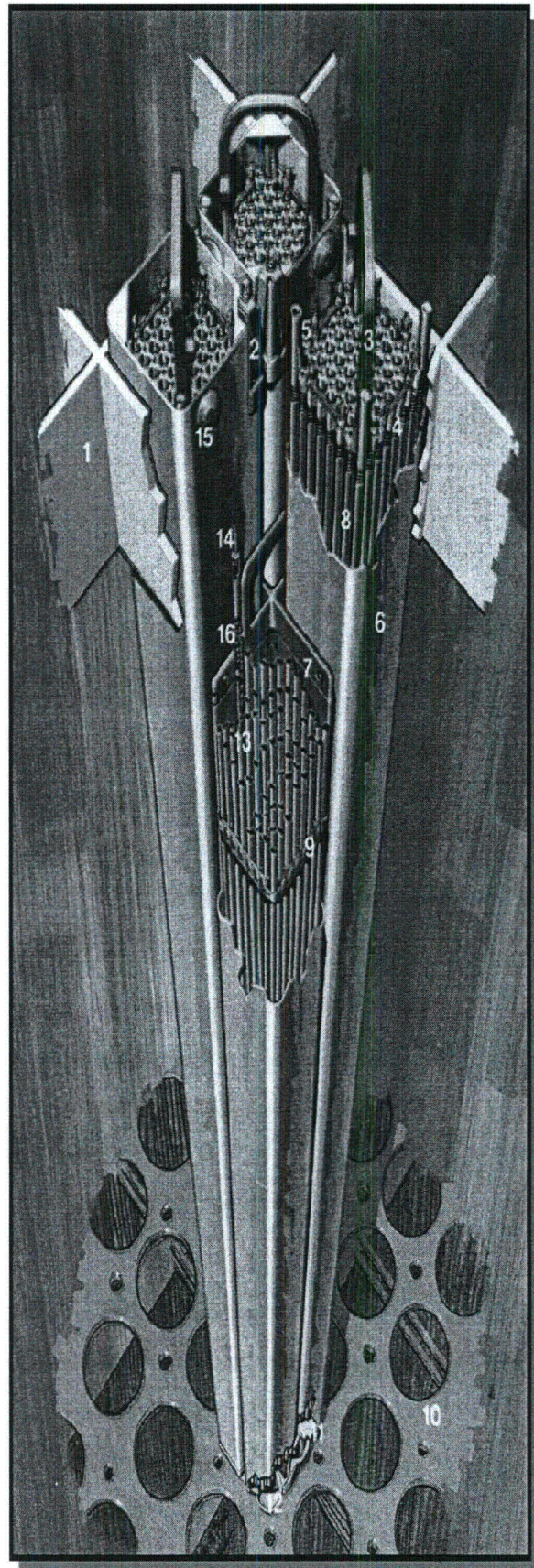
# BWR/3

## Nuclear Steam Supply System



# Typical BWR Fuel Assemblies

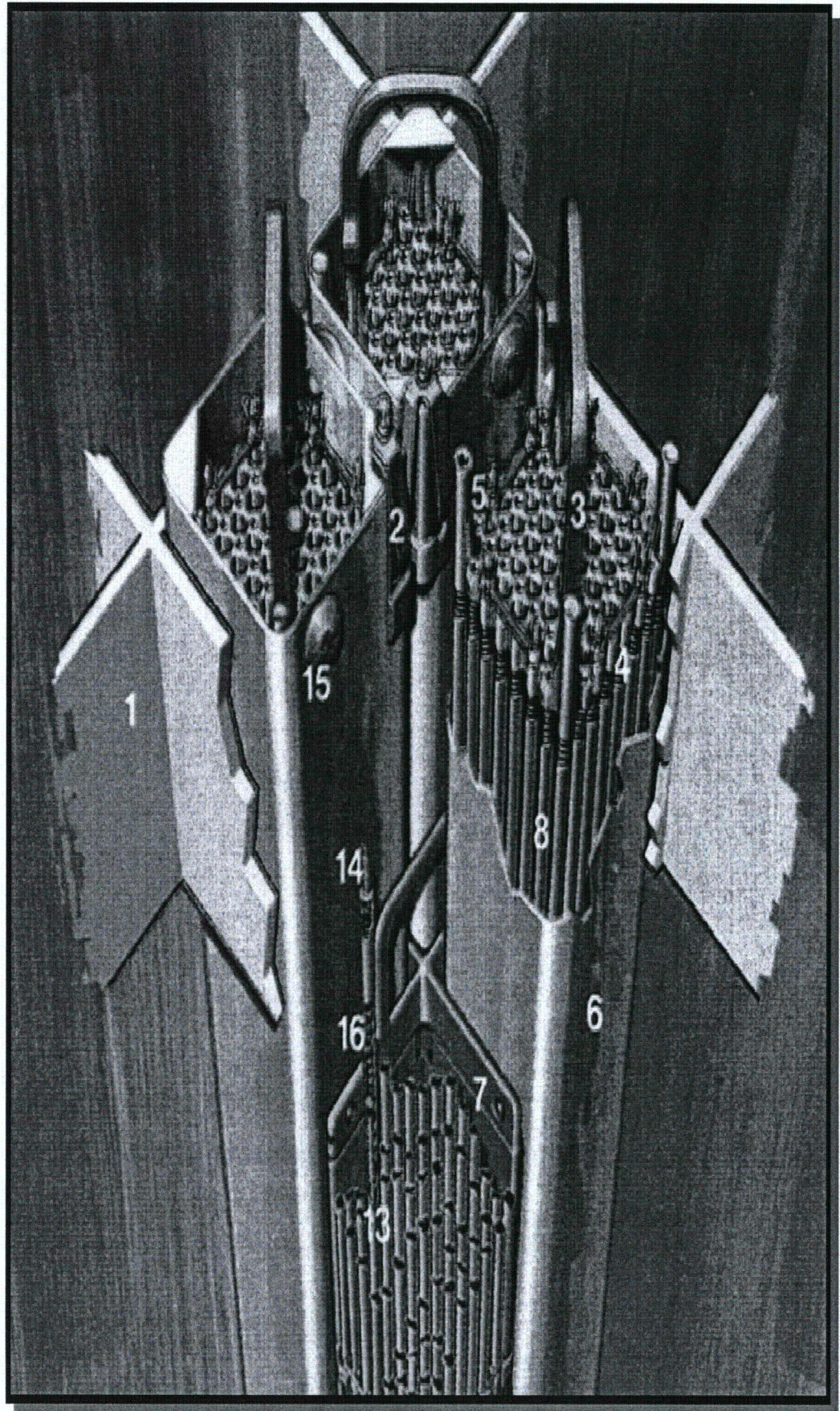
- 1.TOP FUEL GUIDE
- 2.CHANNEL  
FASTENER
- 3.UPPER TIE  
PLATE
- 4.EXPANSION  
SPRING
- 5.LOCKING TAB
- 6.CHANNEL
- 7.CONTROL ROD
- 8.FUEL ROD
- 9.SPACER
- 10.CORE PLATE  
ASSEMBLY
- 11.LOWER  
TIE PLATE
- 12.FUEL SUPPORT  
PIECE
- 13.FUEL PELLETS
- 14.END PLUG
- 15.CHANNEL  
SPACER
- 16.PLENUM  
SPRING

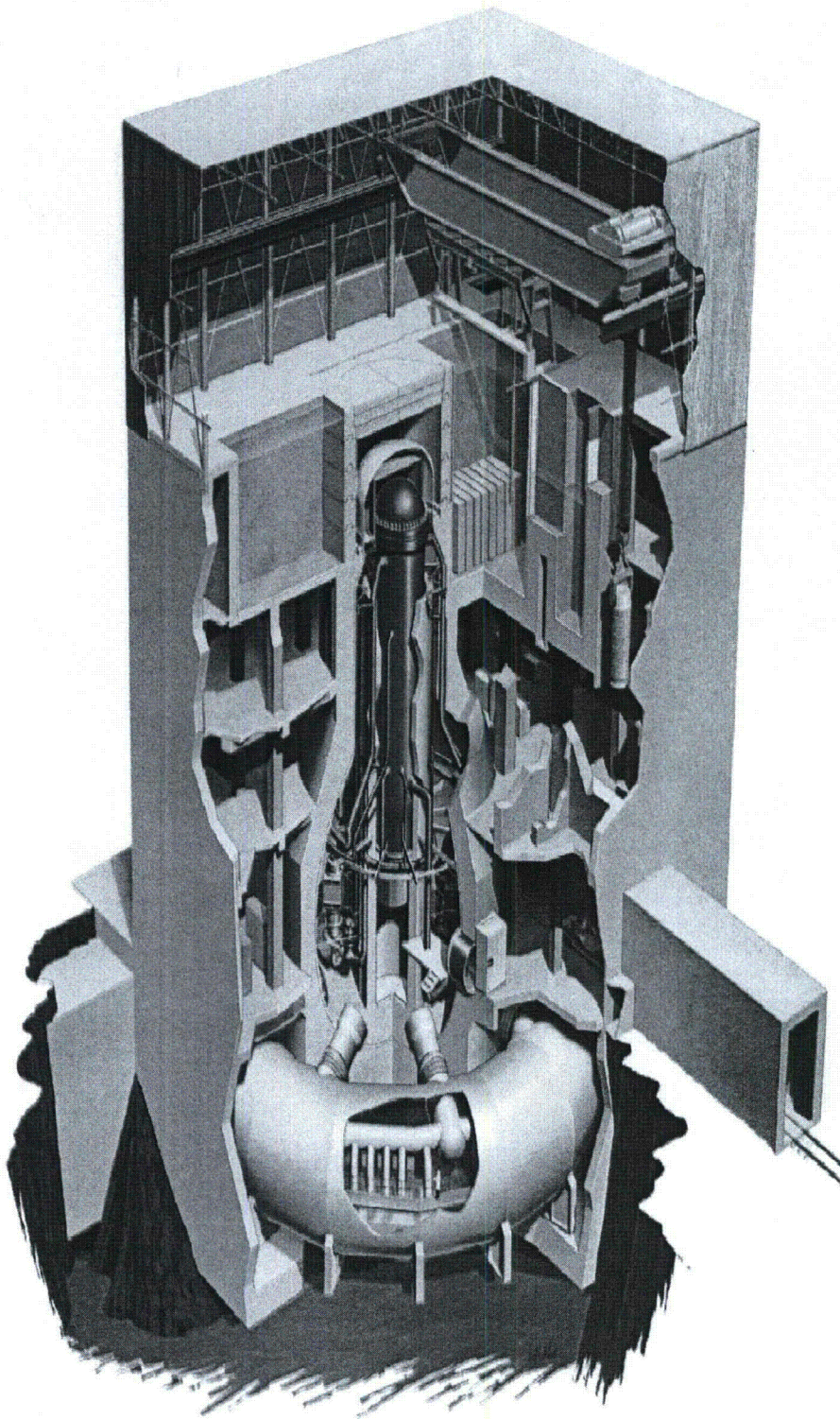




# Typical BWR Fuel Assemblies

- 1.TOP FUEL GUIDE
- 2.CHANNEL  
FASTENER
- 3.UPPER TIE  
PLATE
- 4.EXPANSION  
SPRING
- 5.LOCKING TAB
- 6.CHANNEL
- 7.CONTROL ROD
- 8.FUEL ROD
- 9.SPACER
- 10.CORE PLATE  
ASSEMBLY
- 11.LOWER  
TIE PLATE
- 12.FUEL SUPPORT  
PIECE
- 13.FUEL PELLETS
- 14.END PLUG
- 15.CHANNEL  
SPACER
- 16.PLENUM  
SPRING

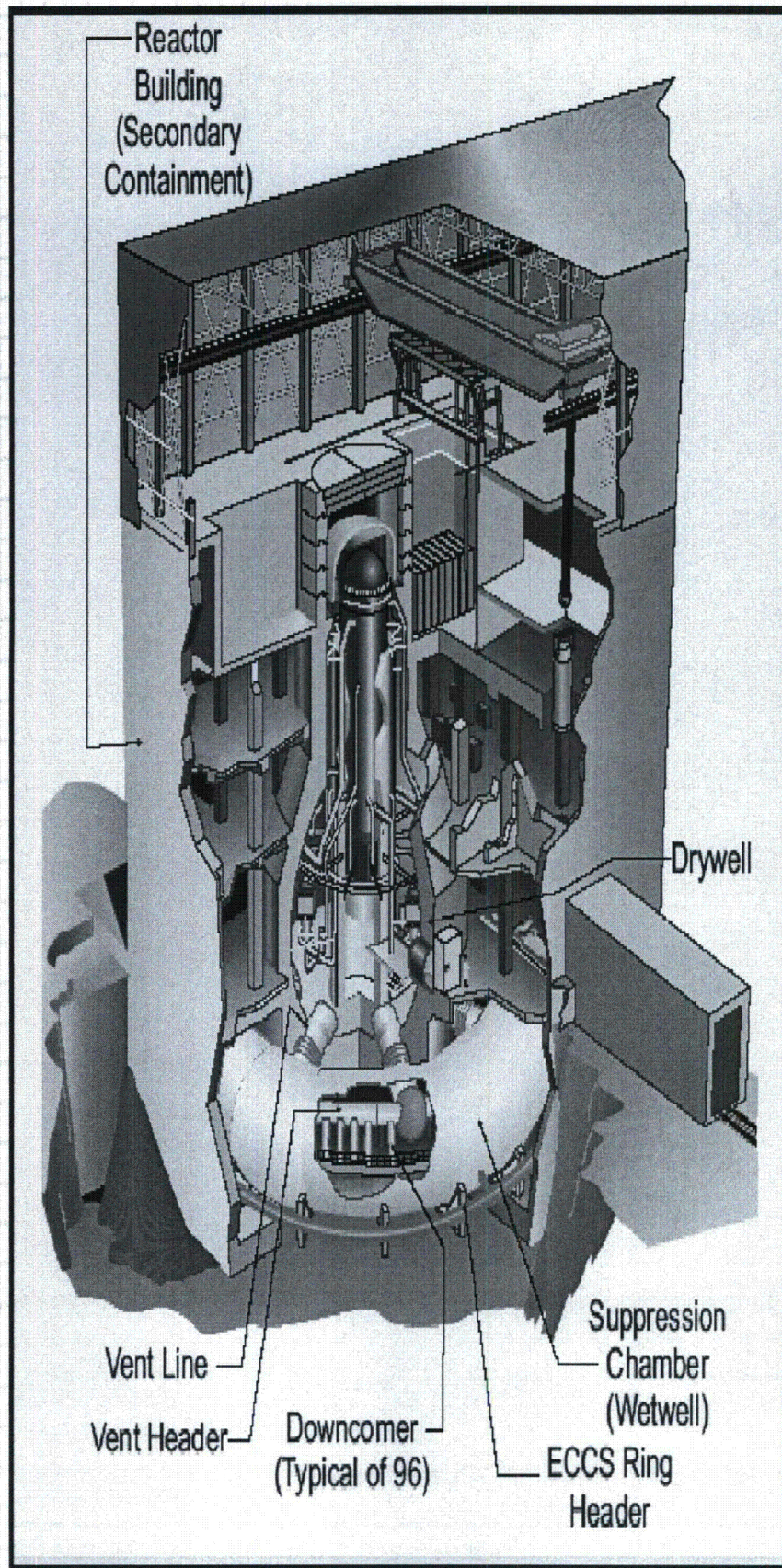




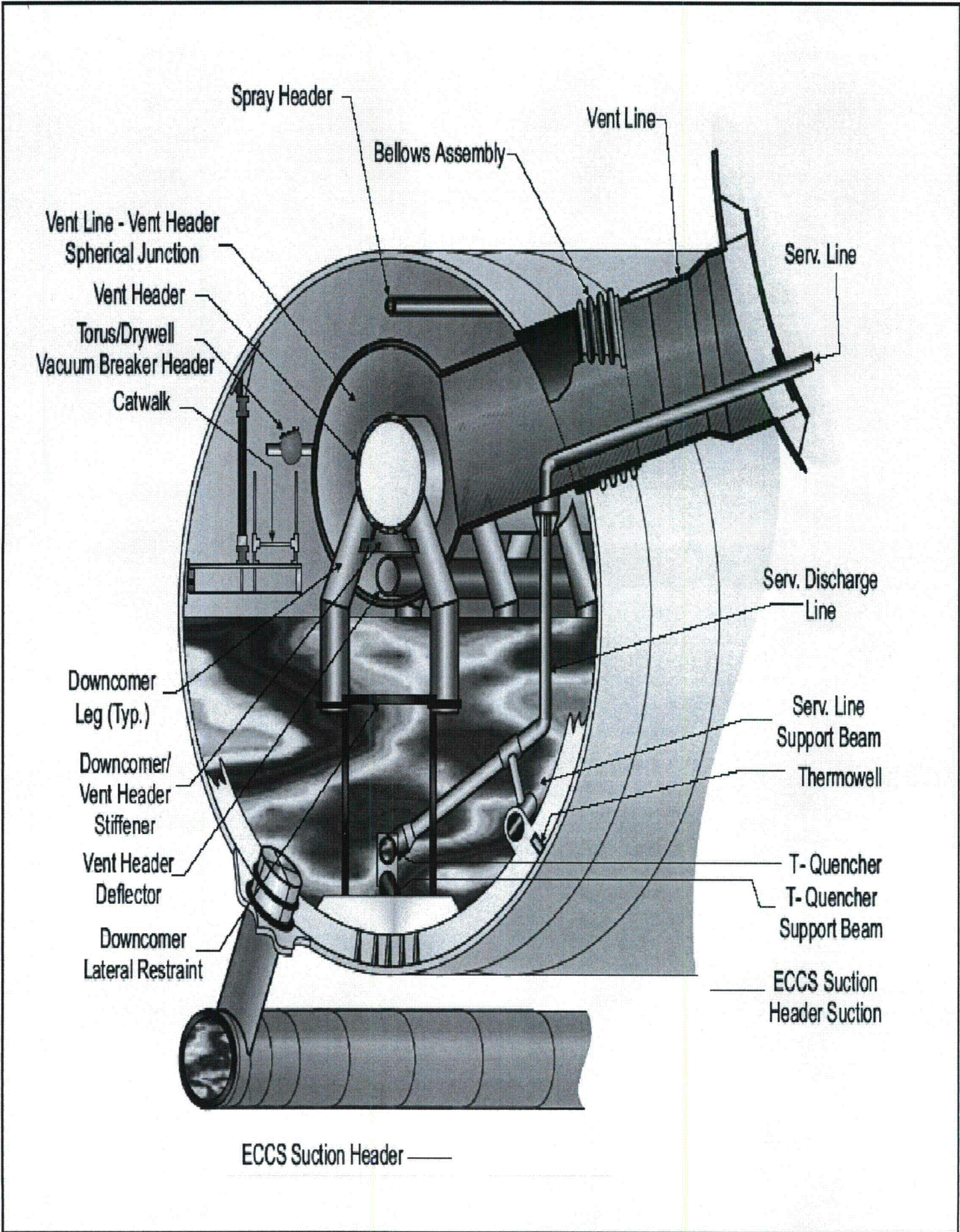
**Typical BWR Mark I Containment**

- Oyster Creek
- Hatch 1 & 2
- Duane Arnold
- Cooper
- Fitzpatrick
- Pilgrim
- Fermi 2
- Hope Creek
- Peach Bottom 2 & 3
- Nine Mile Point 1
- Dresden 2 & 3
- Brunswick 1 & 2
- Monticello
- Quad Cities 1 & 2
- Browns Ferry 2 & 3
- Vermont Yankee

# GE Mark I Containment



- Oyster Creek
- Hatch 1 & 2
- Duane Arnold
- Cooper
- Fitzpatrick
- Pilgrim
- Fermi 2
- Hope Creek
- Peach Bottom 2 & 3
- Nine Mile Point 1
- Dresden 2 & 3
- Brunswick 1 & 2
- Monticello
- Quad Cities 1 & 2
- Browns Ferry 2 & 3
- Vermont Yankee



**From:** RMTFACTSU\_ELNRC <RMTFACTSU\_ELNRC@ofda.gov>  
**Sent:** Sunday, March 13, 2011 4:37 PM  
**To:** Gott, William; Marshall, Jane; Grant, Jeffery; LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; McIntyre, David  
**Subject:** Schedule of DART and RMT meetings/calls  
**Attachments:** Pacific Tsunami-Japan Earthquake RMT and DART meeting schedule.docx  
**Categories:** FOIA

Attached and pasted below is the schedule of regular RMT and DART meetings and calls. Note the color-coding. DART – we have listed the regular meetings that we’re aware of, but please let me know if we should add additional, or if the EAC times change. Times are subject to change and I’ll update as needed.

**Green: Both DART and RMT**  
**Blue – DART only**  
**Yellow – RMT only**

| Meeting                             | Participants                                                                                | Time EDT       | Time JST      |
|-------------------------------------|---------------------------------------------------------------------------------------------|----------------|---------------|
| Interagency call (tentative)        | Response Manager (RM)/Deputy Manager for Planning (DMP), DART Team Leader (TL), Interagency | Est 0400- 0500 | Est 1700-1800 |
| Emergency Action Committee – “lite” | DART                                                                                        | 0430           | 1730          |
| RMT shift change meeting (10 min)   | RMT night and day shifts                                                                    | 0650           | 1950          |
| DART-RMT internal call              | DART and RMT                                                                                | 0700           | 2000          |
| Response Planning Call              | RM, DART TL, Response Director (RD)(Mark Bartolini)                                         | 0800           | 2100          |
| RMT managers meeting (10 min)       | RM, DMO, DMP                                                                                | 0900           | 2200          |
| Hill call                           | RD or RM, designated interagency representatives                                            | 1400           | 0300          |
| RMT meeting                         | RMT                                                                                         | 1730           | 0630          |
| Emergency Action Committee          | DART                                                                                        | 1800           | 0700          |
| RMT shift change meeting            | RMT day and night shifts                                                                    | 1850           | 0750          |
| DART-RMT internal call              | DART and RMT                                                                                | 1900           | 0800          |
| Interagency call (tentative)        | RM/DMP, DART TL, Interagency                                                                | 2100           | 1000          |

*Gavrielle Rosenthal  
Deputy Manager for Planning  
Pacific Tsunami and Japan Earthquake Response Management Team  
USAID/DHCA/OFDA  
Rmtpactsu\_dmp@ofda.gov  
202-712-0039*

**Pacific Tsunami and Japan Earthquake RMT and DART meeting schedule**

|              |
|--------------|
| DC and Japan |
| DC only      |
| Japan only   |

| Meeting                             | Participants                                                                                | Time EDT       | Time JST      |
|-------------------------------------|---------------------------------------------------------------------------------------------|----------------|---------------|
| Interagency call (tentative)        | Response Manager (RM)/Deputy Manager for Planning (DMP), DART Team Leader (TL), Interagency | Est 0400- 0500 | Est 1700-1800 |
| Emergency Action Committee – “lite” | DART                                                                                        | 0430           | 1730          |
| RMT shift change meeting (10 min)   | RMT night and day shifts                                                                    | 0650           | 1950          |
| DART-RMT internal call              | DART and RMT                                                                                | 0700           | 2000          |
| Response Planning Call              | RM, DART TL, Response Director (RD)(Mark Bartolini)                                         | 0800           | 2100          |
| RMT managers meeting (10 min)       | RM, DMO, DMP                                                                                | 0900           | 2200          |
| Hill call                           | RD or RM, designated interagency representatives                                            | 1400           | 0300          |
| RMT meeting                         | RMT                                                                                         | 1730           | 0630          |
| Emergency Action Committee          | DART                                                                                        | 1800           | 0700          |
| RMT shift change meeting            | RMT day and night shifts                                                                    | 1850           | 0750          |
| DART-RMT internal call              | DART and RMT                                                                                | 1900           | 0800          |
| Interagency call (tentative)        | RM/DMP, DART TL, Interagency                                                                | 2100           | 1000          |

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**From:** LIA11 Hoc  
**Sent:** Sunday, March 13, 2011 4:17 PM  
**To:** RMTPACTSU\_ELNRC  
**Cc:** (b)(6); Kozal, Jason  
**Subject:** HSIN Info  
**Attachments:** Current Situation Report - Magnitude 8.9 Earthquake in Japan - 13 Mar 11 (Update 6).pdf

I just got this off HSIN, it's the DHS SITREP. Please note that the NRCC has transitioned to watch/steady state and a couple of the ESFs are being staffed. The NRC may want to join DOE at the NRCC.

Beth



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**From:** LIA11 Hoc  
**Sent:** Sunday, March 13, 2011 3:33 PM  
**To:** RMTPACTSU\_ELNRC  
**Subject:** RE: ET Chronology

**Categories:** FOIA

Yes I will make it a task for this shift and all future day shifts to send you updates every two hours or so.

---

**From:** RMTPACTSU\_ELNRC [mailto:RMTPACTSU\_ELNRC@ofda.gov]  
**Sent:** Sunday, March 13, 2011 3:31 PM  
**To:** LIA11 Hoc  
**Subject:** RE: ET Chronology

These are great. Could we get these every couple of hours?

---

**From:** LIA11 Hoc [mailto:LIA11.Hoc@nrc.gov]  
**Sent:** Sunday, March 13, 2011 3:21 PM  
**To:** Kozal, Jason  
**Cc:** [redacted (b)(6)]; RMTPACTSU\_ELNRC  
**Subject:** RE: ET Chronology

Please see attached

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**From:** Kozal, Jason  
**Sent:** Sunday, March 13, 2011 3:16 PM  
**To:** LIA11 Hoc  
**Cc:** [redacted (b)(6)]; RMTPACTSU\_ELNRC@ofda.gov  
**Subject:** ET Chronology

Please have someone e-mail an updated ET chronology to us please so we can be aware of current ET activities.

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**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Sunday, March 13, 2011 3:20 PM  
**To:** LIA11 Hoc; LIA01 Hoc; LIA07 Hoc  
**Cc:** McIntyre, David; Marshall, Jane; Gott, William; Grant, Jeffery  
**Subject:** FW: DOS Nuclear Plant Update - March 13, 2:35

**Categories:** FOIA

Updated...see the last bullet

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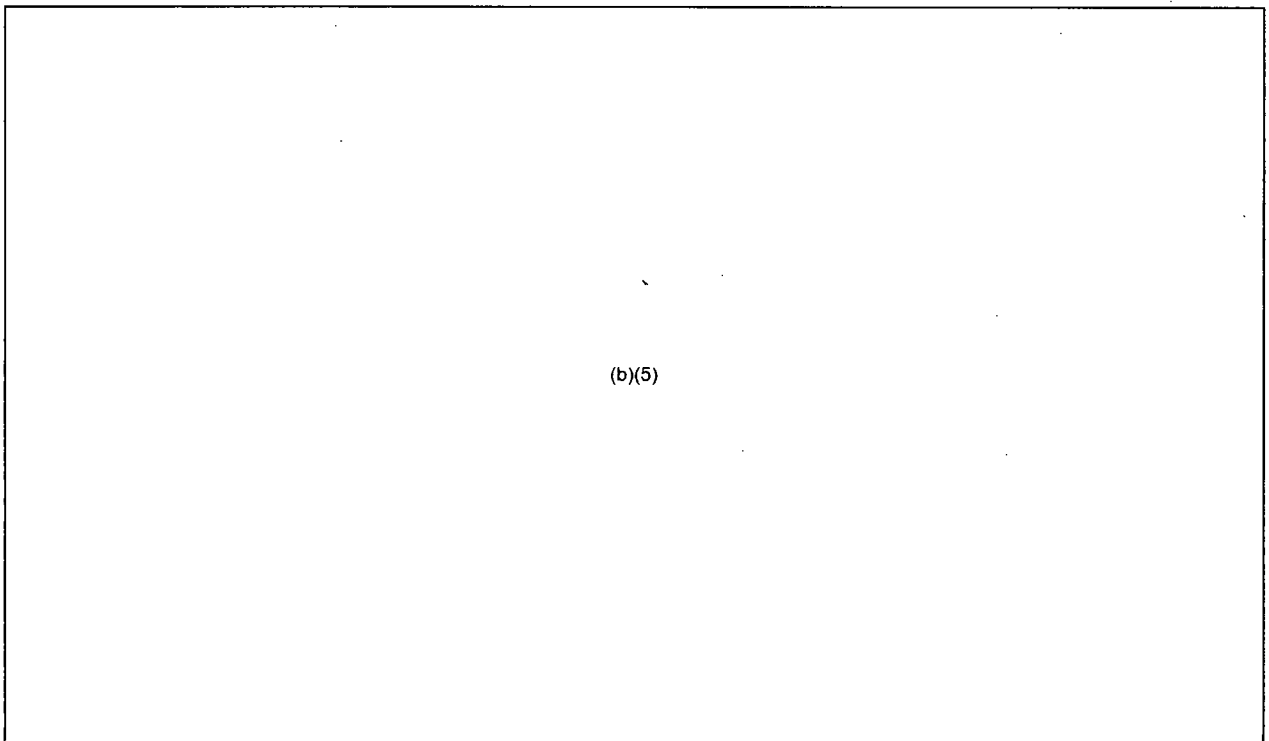
**From:** Goldberg, Joshua W [mailto:GoldbergJW@state.gov]  
**Sent:** Sunday, March 13, 2011 3:15 PM  
**To:** RMT\_PACTSU  
**Subject:** FW: DOS Nuclear Plant Update - March 13, 2:35

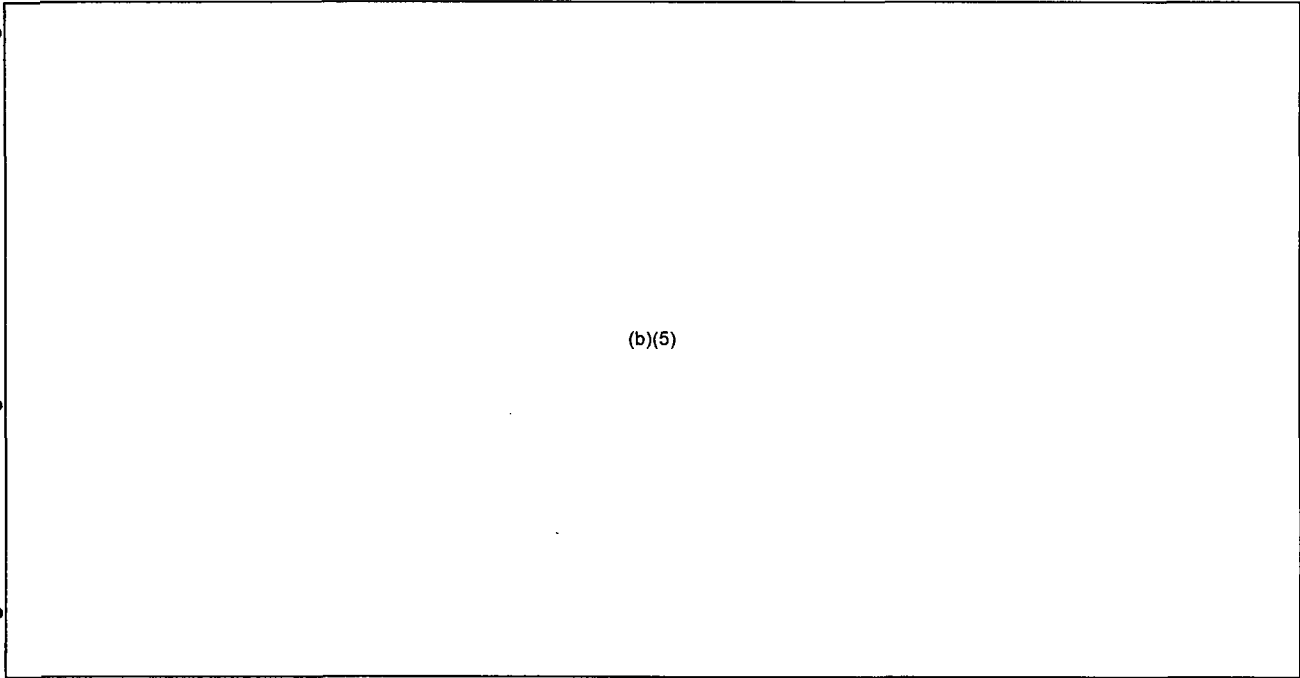
FYI

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**From:** CMS TaskForce1C - Coordinator  
**Sent:** Sunday, March 13, 2011 2:40 PM  
**To:** EAP-Staff-Assistants-DL; Patel, Nirav S; SES\_DutyDeputies; S\_SpecialAssistants; CA-OCS-Duty-Principals; Donovan, Joseph R; Deming, Rust M; Maher, Kevin K; D(N); D(S); P; SES-O; DS Command Center  
**Cc:** TaskForce-1  
**Subject:** DOS Nuclear Plant Update - March 13, 2:35

New and Updated Information on Nuclear Plants:





David Atkinson  
Japan Task Force Coordinator  
202-647-6611

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**From:** Kozal, Jason  
**Sent:** Sunday, March 13, 2011 3:10 PM  
**To:** LIA11 Hoc  
**Cc:** (b)(6); Kowalczyk, Jeffrey; RMTFACTSU\_ELNRC@ofda.gov  
**Subject:** RE: Meeting with Japanese Nuclear Agencies 13 Mar 2200-2400 2011

RMTFACTSU is us. It is our RMT USAID e-mail account it will be universally used by us and Jeff Kowalczyk on the back shift. This is where most of the interagency info will originate from and you can add it to the list of e-mails you send it to along with Jeff K. (See the cc: line)

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**From:** LIA11 Hoc  
**Sent:** Sunday, March 13, 2011 3:08 PM  
**To:** Mike Dudek; Kozal, Jason  
**Subject:** FW: Meeting with Japanese Nuclear Agencies 13 Mar 2200-2400 2011

Have you seen this? Should I forward other e-mails from RMTFACTSU to you?

Beth

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**From:** RMTFACTSU\_ELNRC [mailto:RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Sunday, March 13, 2011 2:39 PM  
**To:** LIA11 Hoc  
**Cc:** Marshall, Jane  
**Subject:** FW: Meeting with Japanese Nuclear Agencies 13 Mar 2200-2400 2011

Joe Hughart's write up of the DART meeting with the Japanese Nuclear Agencies on 13 Mar 2200-2400 Tokyo time. This was discussed at the 1200 call.

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**From:** Legates, Kate (DCHA/OFDA)  
**Sent:** Sunday, March 13, 2011 2:31 PM  
**To:** RMT\_FACTSU  
**Subject:** FW: Meeting with Japanese Nuclear Agencies 13 Mar 2200-2400 2011

fyi

----- Original Message -----

**From:** Hughart, Joseph (FOH) <Joseph.Hughart@foh.hhs.gov>  
**To:** rmtfactsu@ofda.gov <rmtfactsu@ofda.gov>; OFDAGOV: Berger, William; Catlin, Steve(DCHA/OFDA)  
**Sent:** Sun Mar 13 13:37:29 2011  
**Subject:** Meeting with Japanese Nuclear Agencies 13 Mar 2200-2400 2011

Arrived at (b)(6) Hotel in Tokyo. Immediately received call to link up with USAID, State and DOE reps to attend meeting with 3 Japanese nuclear agencies to discuss status of Fukushima nuclear power plant reactors. Following is summary of that meeting.

Japanese agencies included the Nuclear and Industrial Safety Agency, Ministry of Foreign Affairs and Japan Nuclear Energy Safety Organization. They provided a 5-page news release detailing the status of the Fukushima sites and response actions.

Summary of Daiichi reactors: Reactors 1, 2 and 3 were operating at the time the earthquake struck and shut off automatically.

Reactors 4-6 were shut down for maintenance and were not operating when the earthquake struck..

Primary and secondary cooling systems failed in Units 1 and 3, and temperatures began to rise in the reactor cores. An explosion occurred in the outer shell building surrounding Unit 1 on March 12th.

The Japanese speculate that this was due to a buildup of hydrogen gas in the outer building surrounding the reactor containment vessel, and that a similar gas buildup could possibly occur in Unit 3.

They said that the reactor containment vessel in Unit 1 is intact and that a major release of radioactive material has not occurred. Low levels of radioactive iodine and cesium have been detected outside of the containment units. This may be due to venting of steam in Units 1 and 3 that include low levels of radiation. Venting is a safety measure to reduce heat and pressure in the core. The Japanese are pumping sea water into Units 1 and 3 to cover the fuel rods and begin the cooling process.

The status of spent fuel rods pools is unknown.

The cooling circulation system is functioning in Unit 2.

The Japanese have implemented a 20 km evacuation radius around Daiichi, which they believe is more than adequate to protect public health.

They provided a range summary of radiation monitoring data (56 nanoSieverts to 41 microSieverts) at Daiichi.

Daini Reactors:

Four reactors automatically shut off when the earthquake struck. Some heat buildup has occurred, although a backup battery system is in place and circulating water. A 10km evacuation radius has been imposed.

A US admiral from the Ronald Reagan flew in a helo to a Japanese navy ship to meet with his counterpart. Upon return, radiactivity was detected on the heicopter. The Japanese speculated that this may have occurred from venting or when the shi was conducting rescue missions near shore.

Joe Hughart

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**From:** LIA11 Hoc  
**Sent:** Sunday, March 13, 2011 3:05 PM  
**To:** Kozal, Jason  
**Subject:** FW: Latest SitRep  
**Attachments:** USNRC Earthquake-Tsunami Update.031311.1400EDT.docx  
  
**Categories:** FOIA

Jason attached is the latest SITREP, this can be shared with others in the Federal Family.

I will be sure to include you in anything that is sent to Mike.

Beth

-----Original Message-----

**From:** LIA01 Hoc  
**Sent:** Sunday, March 13, 2011 3:03 PM  
**To:** LIA11 Hoc  
**Subject:** FW: Latest SitRep

-----Original Message-----

**From:** LIA01 Hoc  
**Sent:** Sunday, March 13, 2011 2:37 PM  
**To:** 'Mike Dudek'  
**Subject:** Latest SitRep

FYI

Russ

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**From:** LIA11 Hoc  
**Sent:** Sunday, March 13, 2011 3:00 PM  
**To:** Kozal, Jason  
**Subject:** RE: Latest SitRep

**Categories:** FOIA

Jason I just get here and am checking on the latest policy and what can be shared and with whom. I'll get back t you.

Beth

-----Original Message-----

From: Kozal, Jason  
Sent: Sunday, March 13, 2011 2:45 PM  
To: LIA11 Hoc  
Cc: Mike Dudek  
Subject: RE: Latest SitRep

Russ please pass these to me as well and to the NRC e-mail here at the RMT - [RMTPACTSU\\_ELNRC@osda.gov](mailto:RMTPACTSU_ELNRC@osda.gov).

additionally we need to know if we are able to share this information with the rest of the Response Management Team...all Feds.

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From: Mike Dudek <(b)(6)>  
Sent: Sunday, March 13, 2011 2:40 PM  
To: Kozal, Jason  
Subject: Fw: Latest SitRep

--- On Sun, 3/13/11, LIA01 Hoc <[LIA01.Hoc@nrc.gov](mailto:LIA01.Hoc@nrc.gov)> wrote:

> From: LIA01 Hoc <[LIA01.Hoc@nrc.gov](mailto:LIA01.Hoc@nrc.gov)>  
> Subject: Latest SitRep  
> To: "Mike Dudek" <(b)(6)>  
> Date: Sunday, March 13, 2011, 2:36 PM  
> FYI  
>  
>  
> Russ  
>

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**From:** RMPACTSU\_ELNRC <RMPACTSU\_ELNRC@ofda.gov>  
**Sent:** Sunday, March 13, 2011 1:20 PM  
**To:** Marshall, Jane; LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; McIntyre, David  
**Subject:** 0200 Mar 14 - Latest update on Japan earthquake  
**Attachments:** 2011-03-12 running earthquake news updates with times 0200 - Mar 14.docx

**Categories:** FOIA

**Subject:** 0200 Mar 14 - Latest update on Japan earthquake

01:59 March 14, 2011 Monday: Asahi reported 24:58 that the National Police Agency announced that the death toll is now 1,597, and injuries number 1,923. By prefecture, the deaths are: Miyagi (643), Iwate(502), Fukushima (401), Ibaraki (19), Chiba (14), Tokyo (6), Kanagawa (3), Aomori (3), Tochigi (3), and Hokkaido (1). Kyodo news reports that the Miyagi police chief estimates that total deaths will likely surpass 10,000. According to Asahi, the number of demolished buildings is 2,837.

01:52 March 14, 2011 Monday: On March 13 at GMT 16:13, Reuters cited a Kyodo report that a cooling system pump has stopped at the Tokai #2 nuclear power plant in Japan's Ibaraki prefecture. The plant, about 120 km (75 miles) north of Tokyo, suffered a nuclear accident in 1999. Mainichi said the reactor had been automatically shut down due to the earthquake, and now another emergency generator was being used to cool off the reactor. Kyodo reported that the nuclear safety section of the prefectural government said there was no problem with cooling the reactor. Embassy Task Force notes that this is the first we have heard about troubles related to cooling efforts at the Tokai plant.

01:26, March 14, 2011 Monday: NHK online reported March 13 at 23:59 that according to the Ministry of Health, Labor, and Welfare (MHLW), 1.4 million households in 16 prefectures (from Hokkaido to the Chubu area) were out of running water. MHLW also warned that more households will lose water due to the rolling blackout that will go into effect March 14 at 0620. MHLW ordered water operators to analyze the affected areas and notify the public as soon as possible.

01:14, March 14, 2011 Monday: A Consular Task Force team investigated conditions and assisted U.S. citizens at Haneda Airport in Tokyo and reported as of 2100, March 13, that it was mainly business as usual, with no significant delays, no crowds, and no stranded passengers observed. Consular team was told that Japanese Airlines (JAL) and All Nippon Airways (ANA) are temporarily offering expanded service out of Yamagata and Fukushima to make up for lack of train service.

01:11, March 14, 2011 Monday: NHK reported at 2423 that the Transportation Ministry (MLIT) is urging the public to refrain from commuting to work in the morning. The Ministry fears there will be mass confusion in the train stations because the train companies will reduce the number of trains and partially suspend operation.

01:06, March 14, 2011 Monday: The Consular Crisis team in Sendai, Miyagi prefecture, sent the following report at 24:47: We spoke with policeman Saito Akihiko at a police outpost in Sendai city. He and his colleague on duty were calm and had time to answer our questions. They estimated waves came inland 3-5 kilometers. Downtown Sendai, they said, is about 15 kilometers inland. They said they were unable to contact Yamamoto Town Hall, just a few miles away near the coast. City buses were running while noise from sirens of emergency vehicles was constant. A fire was burning downtown, casting smoke over the city. Lights were on downtown, but not outside. Sendai City Education Advisor Iian Williams told us all but one U.S. citizen Sendai City JETs were accounted for. Approximately 300-400 people are currently sleeping in the Prefectural Office lobby, including some in wheelchairs, and are being fed well. A local source



said the first tsunami struck at 15:19 and the heaviest around 15:30. Yamagata prefecture is quickly becoming a favored escape route from the region. Local Japanese news is reporting that Grande 21, a gymnasium that can be converted into an ice rink, will be used as a temporary holding facility for any bodies.

Andrew Ou, Mike Daschbach, and Eriko Marks (on duty at Mission Japan Joint Task Force March 13-14, 2200-0400)

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**From:** Ou, Andrew H

**Sent:** Monday, March 14, 2011 1:05 AM

**To:** Ou, Andrew H; Sim, Hyon B; Mears, Jeremy M; Lee, Ti-Ying; Ryan, Emmett Jerome; Hotz, Raymond E; Forsberg, Aaron P; Whitney, Thomas C; Chen, Perry Y; Burleson, Edward C; Wakahiro, Gary S; Utschig, Andrew S; Bernier-Toth, Michelle; Fitzgerald, Paul M; Zareski, Karen B; Shelbourn, Brian L; Cubas, Jason R; Christopher, William W; Kaneshiro, Claire K; Greene, Raymond F; Stewart, Jonas D; Ries, John N; Dong, Edward K; Jenks, Darrell A; Washburn, Lisa L; Tokyo-Visa-Officers-DL; Roos, John; Luke, Robert S; Ries, John N; Dong, Edward K; Stewart, Jonas D; Greene, Raymond F; Cubas, Jason R; Fuller, Matthew G; Basalla, Suzanne I; Hinds, Lynda J; (b)(6); Cipullo, Timothy L; Cherry, Ronald C; Dresser, Heather L (EAP/J); TOKYO POL All; Wood, Robert A; Nawn, Jeff

**Cc:** Zumwalt, James P; Chipman, Alan R; Engstrom, Aaron; Forbes, James A; Martin, Timothy W; Rathweg-Weitz, Abbey H; Whitten, Richard V; Young, Joseph M; Operations Center; Young, Joseph M; Lyons, Thomas H; CA-Taskforce; Snider, Marc A; Kaneshiro, Claire K; SES-O; SES-O\_CMS; Lyons, Thomas H; Snider, Marc A; Yoo, Donny H; Tomlinson, Christina; Roberts, Richard M; Kaneshiro, Claire K; AVECILLA, Juan T; Chadwick, Michael J; Dieker, Mark S; CA-Taskforce; Ponce, Timothy F; Korff, Meena F; TaskForce-1; CA-Taskforce; Brown, Benjamin A; Wuebbels, Mark C; Osaka-Kobe All State Americans; Sapporo ALL; Naha All; 'lia.hac@nrc.gov'; Fukuoka Americans; Nagoya-Americans-DL; Yokohama-FSI-DL; TOKYO ECON Americans; Tilman, Justin E; 'justin.tilman@nasa.gov'; Sakurai, Joy M; Stewart, Bruce J; Sauer, David M; (b)(6); Cipullo, Timothy L

**Subject:** 0100 Mar 14 - Latest update on Japan earthquake

24:56, March 14, 2011 Monday: American Airlines reports that it is slightly adjusting its routes (planes will fly further out over the ocean, farther away from Honshu and Fukushima) and will carry contingency fuel in case more reroutes are required.

24:14, March 14, 2011 Monday: According to Asahi.com at 23:10, TEPCO hinted that it is possible that a meltdown of the core of reactors #1 and #3 at Fukushima Power Plant #1 (Dai-ichi) is in progress. TEPCO still needs to confirm the real water level, but the water level is lower than the top of the fuel core. According to NHK online, the Nuclear Safety Agency held a press conference around 23:20, and said that the water level in the #3 reactor of Fukushima #1 (Dai-ichi) was 2.2 meters below the top of the fuel core, leaving only about half of the fuel core in water. NHK also reports that the valve to lower the pressure within the reactor had been temporarily closed for repair, but as of 21:00 is now working.

24:10, March 14, 2011 Monday: Mainichi News Online reported March 13 at 22:43 that Ibaraki prefecture announced on March 13 that Ibaraki Airport will reopen on March 14. Four out of Ibaraki's five air routes will resume operation--Skymark Airlines to Kobe, Sapporo, and Nagoya as well as China's Spring Airlines to Shanghai will resume. Not resuming will be Asiana Airlines to Seoul. Ibaraki Airport was kept off limits because the ceiling of the terminal building fell during the earthquake.

Andrew Ou, Mike Daschbach, and Eriko Marks (on duty at Mission Japan Joint Task Force March 13-14, 2200-0400)

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**From:** Ou, Andrew H

**Sent:** Monday, March 14, 2011 12:04 AM

**To:** Ou, Andrew H; Sim, Hyon B; Mears, Jeremy M; Lee, Ti-Ying; Ryan, Emmett Jerome; Hotz, Raymond E; Forsberg, Aaron P; Whitney, Thomas C; Chen, Perry Y; Burleson, Edward C; Wakahiro, Gary S; Utschig, Andrew S; Bernier-Toth, Michelle; Fitzgerald, Paul M; Zareski, Karen B; Shelbourn, Brian L; Cubas, Jason R; Christopher, William W; Kaneshiro,

Claire K; Greene, Raymond F; Stewart, Jonas D; Ries, John N; Dong, Edward K; Jenks, Darrell A; Washburn, Lisa L; Tokyo-Visa-Officers-DL; Roos, John; Luke, Robert S; Ries, John N; Dong, Edward K; Stewart, Jonas D; Greene, Raymond F; Cubas, Jason R; Fuller, Matthew G; Basalla, Suzanne I; Hinds, Lynda J; (b)(6); Cipullo, Timothy L; Cherry, Ronald C; Dresser, Heather L (EAP/J); TOKYO POL All; Wood, Robert A; Nawn, Jeff  
**Cc:** Zumwalt, James P; Chipman, Alan R; Engstrom, Aaron; Forbes, James A; Martin, Timothy W; Rathweg-Weitz, Abbey H; Whitten, Richard V; Young, Joseph M; Operations Center; Young, Joseph M; Lyons, Thomas H; CA-Taskforce; Snider, Marc A; Kaneshiro, Claire K; SES-O; SES-O\_CMS; Lyons, Thomas H; Snider, Marc A; Yoo, Donny H; Tomlinson, Christina; Roberts, Richard M; Kaneshiro, Claire K; AVECILLA, Juan T; Chadwick, Michael J; Dieker, Mark S; CA-Taskforce; Ponce, Timothy F; Korff, Meena F; TaskForce-1; CA-Taskforce; Brown, Benjamin A; Wuebbels, Mark C; Osaka-Kobe All State Americans; Sapporo ALL; Naha All; 'lia.hac@nrc.gov'; Fukuoka Americans; Nagoya-Americans-DL; Yokohama-FSI-DL; TOKYO ECON Americans; Tilman, Justin E; 'justin.tilman@nasa.gov'; Sakurai, Joy M; Stewart, Bruce J; Sauer, David M; (b)(6); Cipullo, Timothy L

**Subject:** 2400 Mar 13 - Latest update on Japan earthquake

23:56, March 13, 2011 Sunday: Iwate prefectural government contact told Sapporo Consulate General that one Amcitt JET was missing: Dickson Montgomery who was assigned in Rikuzen Hakata, a small town on the Iwate coast.

23:55, March 13, 2011 Sunday: State Dept. Task Force asks that offers from the U.S. private sector to assist with relief efforts be forwarded to OFDA at the following email: [rmtpactsu\\_elc@ofda.gov](mailto:rmtpactsu_elc@ofda.gov). Please copy the State Dept. Task Force ("zTask Force 1 Mailbox" in the GAL) for their situational awareness.

23:41, March 13, 2011 Sunday: A Washington-based American Airlines executive reports that he is contacting the FAA and the NSC regarding the power plant situation. All of its flights to/from Tokyo (except Los Angeles) fly over the affected area, therefore AA has "heightened concern."

23:20, March 13, 2011 Sunday: According to NHK News, TEPCO reports that the pumping system for sending water to reactors #1, #2, and #4 of Fukushima Nuclear Power Plant #2 (Daini) is not working due to tsunami damage, and the cooling system is therefore not functioning. NHK reports that TEPCO will change the pumping system monitors of each unit sometime in the early morning hours.

23:15, March 13, 2011 Sunday: NHK reports that not all traffic lights have power generators, according to the police. During the rolling black-outs, policemen will be directing traffic, but not at all intersections. During the blackout period, the police are discouraging the use of cars and motorcycles. If you must drive them, they recommend to driving slowly and cautiously in those areas.

Andrew Ou, Mike Daschbach, and Eriko Marks (on duty at Mission Japan Joint Task Force March 14, 2200-0400)

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**From:** Ou, Andrew H

**Sent:** Sunday, March 13, 2011 11:12 PM

**To:** Sim, Hyon B; Mears, Jeremy M; Lee, Ti-Ying; Ryan, Emmett Jerome; Hotz, Raymond E; Forsberg, Aaron P; Whitney, Thomas C; Chen, Perry Y; Burlson, Edward C; Wakahiro, Gary S; Utschig, Andrew S; Bernier-Toth, Michelle; Fitzgerald, Paul M; Zareski, Karen B; Shelbourn, Brian L; Cubas, Jason R; Christopher, William W; Kaneshiro, Claire K; Greene, Raymond F; Stewart, Jonas D; Ries, John N; Dong, Edward K; Jenks, Darrell A; Washburn, Lisa L; Tokyo-Visa-Officers-DL; Roos, John; Luke, Robert S; Ries, John N; Dong, Edward K; Stewart, Jonas D; Greene, Raymond F; Cubas, Jason R; Fuller, Matthew G; Basalla, Suzanne I; Hinds, Lynda J; (b)(6); Cipullo, Timothy L; Cherry, Ronald C; Dresser, Heather L (EAP/J); TOKYO POL All; Wood, Robert A; Nawn, Jeff

**Cc:** Zumwalt, James P; Chipman, Alan R; Engstrom, Aaron; Forbes, James A; Martin, Timothy W; Rathweg-Weitz, Abbey H; Whitten, Richard V; Young, Joseph M; Operations Center; Young, Joseph M; Lyons, Thomas H; CA-Taskforce; Snider, Marc A; Kaneshiro, Claire K; SES-O; SES-O\_CMS; Lyons, Thomas H; Snider, Marc A; Yoo, Donny H; Tomlinson, Christina; Roberts, Richard M; Kaneshiro, Claire K; AVECILLA, Juan T; Chadwick, Michael J; Dieker, Mark S; CA-Taskforce; Ponce, Timothy F; Korff, Meena F; TaskForce-1; CA-Taskforce; Brown, Benjamin A; Wuebbels, Mark C; Osaka-Kobe All State Americans; Sapporo ALL; Naha All; 'lia.hac@nrc.gov'; Fukuoka Americans; Nagoya-Americans-DL; Yokohama-FSI-DL; TOKYO ECON Americans; Tilman, Justin E; 'justin.tilman@nasa.gov'; Sakurai, Joy M; Stewart, Bruce J; Sauer, David M; (b)(6); Cipullo, Timothy L

**Subject:** 2312 Mar 13 - Latest update on Japan earthquake

22:35, March 13, 2011 Sunday: Jiji.com reports that the Japanese Self Defense Force (SDF) has rescued 6,500 people on the March 13 alone and that 9,700 people were rescued since the earth quake hit. US carrier Ronald Reagan also joined the rescue efforts in the afternoon on the 13th. The number of SDF rescue forces will increase from the current 50,000 to 100,000 people within a week.

22:35, March 13, 2011 Sunday: Asahi has announced the schedule (Japanese only for now) for rolling black-outs starting tomorrow at 6:20AM. We believe that no black-out is planned for central Tokyo. See the link: <http://www.asahi.com/national/update/0313/TKY201103130277.html>

22:16, March 13, 2011 Sunday: NHK reported that President Shimizu of Tokyo Electric Power Company (TEPCO) said at a press conference at 8:30 pm that TEPCO is considering using seawater to cool off the reactor Unit #2 of Fukushima Daiichi Nuclear Power Plant.

22:15, March 13, 2011 Sunday: According to Jiji press reports, Fukushima prefecture will start radiation exposure screening at all evacuation stations, hopefully as early as the 15<sup>th</sup>. The prefectural requested more instruments and staff to measure radiation from the central government. They are planning to establish 80 teams of investigators to check for radiation exposure. There are about 470 or 480 evacuation stations in the prefecture. The teams will visit all of those sites and conduct screening for those who request it.

22:00, March 13, 2011, Sunday: Mike Daschbach, Andrew Ou, and Eriko Marks assume duty at Joint Task Force.

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**From:** Sim, Hyon B

**Sent:** Sunday, March 13, 2011 10:03 PM

**To:** Sim, Hyon B; Mears, Jeremy M; Lee, Ti-Ying; Ryan, Emmett Jerome; Hotz, Raymond E; Forsberg, Aaron P; Whitney, Thomas C; Chen, Perry Y; Burlison, Edward C; Wakahiro, Gary S; Utschig, Andrew S; Bernier-Toth, Michelle; Fitzgerald, Paul M; Zareski, Karen B; Shelbourn, Brian L; Cubas, Jason R; Christopher, William W; Kaneshiro, Claire K; Greene, Raymond F; Stewart, Jonas D; Ries, John N; Dong, Edward K; Jenks, Darrell A; Washburn, Lisa L; Tokyo-Visa-Officers-DL; Roos, John; Luke, Robert S; Ries, John N; Dong, Edward K; Stewart, Jonas D; Greene, Raymond F; Cubas, Jason R; Fuller, Matthew G; Basalla, Suzanne I; Hinds, Lynda J; (b)(6); Cipullo, Timothy L; Cherry, Ronald C; Dresser, Heather L (EAP/J); TOKYO POL All; Wood, Robert A

**Cc:** Zumwalt, James P; Chipman, Alan R; Engstrom, Aaron; Forbes, James A; Martin, Timothy W; Rathweg-Weitz, Abbey H; Whitten, Richard V; Young, Joseph M; Operations Center; Young, Joseph M; Lyons, Thomas H; CA-Taskforce; Snider, Marc A; Kaneshiro, Claire K; SES-O; SES-O\_CMS; Lyons, Thomas H; Snider, Marc A; Yoo, Donny H; Tomlinson, Christina; Roberts, Richard M; Kaneshiro, Claire K; AVECILLA, Juan T; Chadwick, Michael J; Dieker, Mark S; CA-Taskforce; Ponce, Timothy F; Korff, Meena F; TaskForce-1; CA-Taskforce; Brown, Benjamin A; Wuebbels, Mark C; Osaka-Kobe All State Americans; Sapporo ALL; Naha All; 'lia.hac@nrc.gov'; Fukuoka Americans; Nagoya-Americans-DL; Yokohama-FSI-DL; TOKYO ECON Americans; Tilman, Justin E; 'justin.tilman@nasa.gov'; Sakurai, Joy M; Stewart, Bruce J; Sauer, David M; (b)(6); Cipullo, Timothy L

**Subject:** 2200 Mar 13 - Latest update on Japan earthquake

21:44, March 13, 2011, Sunday: According to Yahoo Japan, TEPCO announced it was getting ready to flood Fukushima NPP No. 1, reactor No. 2 with sea water to help cool it down. This brings to three the number of reactors TEPCO is trying to cool using sea water (NPP No. 1, Reactors No. 1, 2 and 3).

21:41, March 13, 2011, Sunday: According to Yahoo Japan, 1,710,000 households are still without power, and an additional 440,000 households were without gas service. Power and gas companies were distributing portable kerosene burners and cans of kerosene at evacuation facilities.

21:39, March 13, 2011, Sunday: According to Mainichi, 1,500 are dead and 340,000 are displaced. Most of the unaccounted for are from the towns of Minami-Sanriku in Miyagi Prefecture (10,000 unaccounted, total population 17,000) and Otsuchi in Iwate Prefecture (10,000 unaccounted, total population 16,000).

21:38, March 13, 2011, Sunday: According to Reuters, France recommended its citizens leave the Tokyo region of Japan on Sunday, citing the risk of further earthquakes and uncertainty about the situation at its damaged NPPs. "It seems reasonable to advise those who do not have a particular reason to stay in the Tokyo region to leave the Kanto (Tokyo) region for a few days," a statement on the French embassy website in Japan said. "We strongly advise our nationals not to travel to Japan and we strongly recommend delaying any voyage planned," it added.

21:22, March 13, 2011, Sunday: According to Kyodo news, TEPCO announced that radiation released from the NPPs will NOT affect humans.

21:20, March 13, 2011, Sunday: According to Kyodo news, TEPCO will avoid rolling blackouts in central Tokyo.

21:09, March 13, 2011, Sunday: Both Alan Remick from Department of Energy (DOE) and Joe Hughart from Health and Human Services (HHS) have arrived at the Hotel (b)(6) and will be heading over to the Ministry of Foreign Affairs (MOFA) shortly for meetings with their Nuclear and Industrial Safety Agency (NISA) counterparts. MOFA Nuclear Division's Kazumi Yamada confirmed she shared the seven questions from DOE with NISA this evening, ahead of the planned meeting.

21:00, March 13, 2011, Sunday: According to Manichi, the DPJ and LDP have agreed to reconvene the Diet after a "natural break" from March 14-18 (there was a call for a formal break in Diet activity, defined by resolution). Among the top issues on the Diet agenda are the possible need for emergency legislation permitting a short-term tax increase to pay for the costs of recovery operations, as well as other measures to temporarily increase GOJ revenue and a three-month extension of the tax cut package scheduled to expire in March.

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SBU  
This email is UNCLASSIFIED.

01:59 March 14, 2011 Monday: Asahi reported 24:58 that the National Police Agency announced that the death toll is now 1,597, and injuries number 1,923. By prefecture, the deaths are: Miyagi (643), Iwate(502), Fukushima (401), Ibaraki (19), Chiba (14), Tokyo (6), Kanagawa (3), Aomori (3), Tochigi (3), and Hokkaido (1). Kyodo news reports that the Miyagi police chief estimates that total deaths will likely surpass 10,000. According to Asahi, the number of demolished buildings is 2,837.

01:52 March 14, 2011 Monday: On March 13 at GMT 16:13, Reuters cited a Kyodo report that a cooling system pump has stopped at the Tokai #2 nuclear power plant in Japan's Ibaraki prefecture. The plant, about 120 km (75 miles) north of Tokyo, suffered a nuclear accident in 1999. Mainichi said the reactor had been automatically shut down due to the earthquake, and now another emergency generator was being used to cool off the reactor. Kyodo reported that the nuclear safety section of the prefectural government said there was no problem with cooling the reactor. Embassy Task Force notes that this is the first we have heard about troubles related to cooling efforts at the Tokai plant.

01:26, March 14, 2011 Monday: NHK online reported March 13 at 23:59 that according to the Ministry of Health, Labor, and Welfare (MHLW), 1.4 million households in 16 prefectures (from Hokkaido to the Chubu area) were out of running water. MHLW also warned that more households will lose water due to the rolling blackout that will go into effect March 14 at 0620. MHLW ordered water operators to analyze the affected areas and notify the public as soon as possible.

01:14, March 14, 2011 Monday: A Consular Task Force team investigated conditions and assisted U.S. citizens at Haneda Airport in Tokyo and reported as of 2100, March 13, that it was mainly business as usual, with no significant delays, no crowds, and no stranded passengers observed. Consular team was told that Japanese Airlines (JAL) and All Nippon Airways (ANA) are temporarily offering expanded service out of Yamagata and Fukushima to make up for lack of train service.

01:11, March 14, 2011 Monday: NHK reported at 2423 that the Transportation Ministry (MLIT) is urging the public to refrain from commuting to work in the morning. The Ministry fears there will be mass confusion in the train stations because the train companies will reduce the number of trains and partially suspend operation.

01:06, March 14, 2011 Monday: The Consular Crisis team in Sendai, Miyagi prefecture, sent the following report at 24:47: We spoke with policeman Saito Akihiko at a police outpost in Sendai city. He and his colleague on duty were calm and had time to answer our questions. They estimated waves came inland 3-5 kilometers. Downtown Sendai, they said, is about 15 kilometers inland. They said they were unable to contact Yamamoto Town Hall, just a few miles away near the coast. City buses were running while noise from sirens of emergency vehicles was constant. A fire was burning downtown, casting smoke over the city. Lights were on downtown, but not outside. Sendai City Education Advisor Ian Williams told us all but one U.S. citizen Sendai City JETs were accounted for. Approximately 300-400 people are currently sleeping in the Prefectural Office lobby, including some in wheelchairs, and are being fed well. A local source said the first tsunami struck at 15:19 and the heaviest around 15:30. Yamagata prefecture is quickly becoming a favored escape route from the region. Local Japanese news is reporting that Grande 21, a gymnasium that can be converted into an ice rink, will be used as a temporary holding facility for any bodies.

24:56, March 14, 2011 Monday: American Airlines reports that it is slightly adjusting its routes (planes will fly further out over the ocean, farther away from Honshu and Fukushima) and will carry contingency fuel in case more reroutes are required.

24:14, March 14, 2011 Monday: According to Asahi.com at 23:10, TEPCO hinted that it is possible that a meltdown of the core of reactors #1 and #3 at Fukushima Power Plant #1 (Dai-ichi) is in progress. TEPCO still needs to confirm the real water level, but the water level is lower than the top of the fuel core. According to NHK online, the Nuclear Safety Agency held a press conference around 23:20, and said that the water level in the #3 reactor of Fukushima #1 (Dai-ichi) was 2.2 meters below the top of the fuel core, leaving only about half of the fuel core in water. NHK also reports that the valve to lower the pressure within the reactor had been temporarily closed for repair, but as of 21:00 is now working.

24:10, March 14, 2011 Monday: Mainichi News Online reported March 13 at 22:43 that Ibaraki prefecture announced on March 13 that Ibaraki Airport will reopen on March 14. Four out of Ibaraki's five air routes will resume operation--Skymark Airlines to Kobe, Sapporo, and Nagoya as well as China's Spring Airlines to Shanghai will resume. Not resuming will be Asiana Airlines to Seoul. Ibaraki Airport was kept off limits because the ceiling of the terminal building fell during the earthquake.

23:56, March 13, 2011 Sunday: Iwate prefectural government contact told Sapporo Consulate General that one Amcit JET was missing: Dickson Montgomery who was assigned in Rikuzen Hakata, a small town on the Iwate coast.

23:55, March 13, 2011 Sunday: State Dept. Task Force asks that offers from the U.S. private sector to assist with relief efforts be forwarded to OFDA at the following email: [rmtpactsu\\_elc@ofda.gov](mailto:rmtpactsu_elc@ofda.gov). Please copy the State Dept. Task Force ("zTask Force 1 Mailbox" in the GAL) for their situational awareness.

23:41, March 13, 2011 Sunday: A Washington-based American Airlines executive reports that he is contacting the FAA and the NSC regarding the power plant situation. All of its flights to/from Tokyo (except Los Angeles) fly over the affected area, therefore AA has "heightened concern."

23:20, March 13, 2011 Sunday: According to NHK News, TEPCO reports that the pumping system for sending water to reactors #1, #2, and #4 of Fukushima Nuclear Power Plant #2 (Dai-ni) is not working due to tsunami damage, and the cooling system is therefore not functioning. NHK reports that TEPCO will change the pumping system monitors of each unit sometime in the early morning hours.

23:15, March 13, 2011 Sunday: NHK reports that not all traffic lights have power generators, according to the police. During the rolling black-outs, policemen will be directing traffic, but not at all intersections. During the blackout period, the police are discouraging the use of cars and motorcycles. If you must drive them, they recommend to driving slowly and cautiously in those areas.

22:35, March 13, 2011 Sunday: Jiji.com reports that the Japanese Self Defense Force (SDF) has rescued 6,500 people on the March 13 alone and that 9,700 people were rescued since the earth quake hit. US carrier Ronald Reagan also joined the rescue efforts in the afternoon on the 13th. The number of SDF rescue forces will increase from the current 50,000 to 100,000 people within a week.

22:35, March 13, 2011 Sunday: Asahi has announced the schedule (Japanese only for now) for rolling black-outs starting tomorrow at 6:20AM. We believe that no black-out is planned for central Tokyo. See the link: <http://www.asahi.com/national/update/0313/TKY201103130277.html>

22:16, March 13, 2011 Sunday: NHK reported that President Shimizu of Tokyo Electric Power Company (TEPCO) said at a press conference at 8:30 pm that TEPCO is considering using seawater to cool off the reactor Unit #2 of Fukushima Daiichi Nuclear Power Plant.

22:15, March 13, 2011 Sunday: According to Jiji press reports, Fukushima prefecture will start radiation exposure screening at all evacuation stations, hopefully as early as the 15<sup>th</sup>. The prefectural requested more instruments and staff to measure radiation from the central government. They are planning to establish 80 teams of investigators to check for radiation exposure. There are about 470 or 480 evacuation stations in the prefecture. The teams will visit all of those sites and conduct screening for those who request it.

22:00, March 13, 2011, Sunday: Mike Daschbach, Andrew Ou, and Eriko Marks assume duty at Joint Task Force.

21:44, March 13, 2011, Sunday: According to Yahoo Japan, TEPCO announced it was getting ready to flood Fukushima NPP No. 1, reactor No. 2 with sea water to help cool it down. This brings to three the number of reactors TEPCO is trying to cool using sea water (NPP No. 1, Reactors No. 1, 2 and 3).

21:41, March 13, 2011, Sunday: According to Yahoo Japan, 1,710,000 households are still without power, and an additional 440,000 households were without gas service. Power and gas companies were distributing portable kerosene burners and cans of kerosene at evacuation facilities.

21:39, March 13, 2011, Sunday: According to Mainichi, 1,500 are dead and 340,000 are displaced. Most of the unaccounted for are from the towns of Minami-Sanriku in Miyagi Prefecture (10,000 unaccounted, total population 17,000) and Otsuchi in Iwate Prefecture (10,000 unaccounted, total population 16,000).

21:38, March 13, 2011, Sunday: According to Reuters, France recommended its citizens leave the Tokyo region of Japan on Sunday, citing the risk of further earthquakes and uncertainty about the situation at its damaged NPPs. "It seems reasonable to advise those who do not have a particular reason to stay in the Tokyo region to leave the Kanto (Tokyo) region for a few days," a statement on the French embassy website in Japan said. "We strongly advise our nationals not to travel to Japan and we strongly recommend delaying any voyage planned," it added.

21:22, March 13, 2011, Sunday: According to Kyodo news, TEPCO announced that radiation released from the NPPs will NOT affect humans.

21:20, March 13, 2011, Sunday: According to Kyodo news, TEPCO will avoid rolling blackouts in central Tokyo.

21:09, March 13, 2011, Sunday: Both Alan Remick from Department of Energy (DOE) and Joe Hughart from Health and Human Services (HHS) have arrived at the Hotel (b)(6) and will be heading over to the Ministry of Foreign Affairs (MOFA) shortly for meetings with their Nuclear and Industrial Safety Agency (NISA) counterparts. MOFA Nuclear Division's Kazumi Yamada confirmed she shared the seven questions from DOE with NISA this evening, ahead of the planned meeting.

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21:00, March 13, 2011, Sunday: According to Yahoo News, Tohoku Power Company (covering North-East Japan) announced that it will not be conducting rolling black-outs on March 14.

20:41, March 13, 2011, Sunday: According to NHK news, TEPCO announced that as a result of the damage to both nuclear and conventional power plants, starting at 06:00 on March 14 until 22:00, TEPCO will institute three hour rolling black outs among the five "zones" under its control. As March 13 is not a work day, many factories were not in operation, as such, rolling blackouts were not necessary. With the resumption of the workweek, however, during the peak usage of 18:00-19:00, TEPCO expects a demand of 41 million kilowatts. Depending on the electricity demand and the state of efforts to restore power production capacity, the blackout plan could continue even after March 15. This is the first time TEPCO has implemented a "blackout plan" since it was founded in 1951. Separately, according to Kyodo news, TEPCO may allow for rolling blackouts until the end of April 2011.

20:33, March 13, 2011, Sunday: GOJ spokesman Yukio Edano said he has urged Japanese ministries and offices abroad to actively provide information about Friday's earthquake and ensuing tsunami to foreign nationals in and outside Japan. The Prime Minister's Office (Kantei) has set up a website <http://www.kantei.go.jp/foreign/index-e.html> where users may access the latest quake-related information and GOJ official statements. Foreign Press spokesman Noriyuki Shikata is also regularly posting updates on his Twitter account, @norishikata.

20:15, March 13, 2011, Sunday: Rough translation summary of Prime Minister Kan's 19:50 press conference:

- Many power plants have been damaged, leading to a difficult power situation in all of northern Japan, including Tokyo. The two main power companies are working to resolve the situation, but there is not enough power. In order to avoid large-scale power outages, which would lead to great social and economic damage and could affect gas, water, and medical infrastructure, I (Kan) have allowed for rolling power outages starting on March 14.
- Thanks to the efforts of all, including the Japan Self-Defense Force (JSDF) and the National Police Agency (NPA), over 12,000 have been rescued. Over 50,000 JSDF have been dispatched, with plans for 100,000. 2,500 police and 1,100 fire department personnel have been sent to localities, as well as over 200 specialized search and rescue personnel.
- Various taskforces are being set up, and there may be a need for new legislation to respond to the crisis.



- Food, water, and blankets are a priority, and the various methods of transport for these necessities are being secured.
- Kan characterized the crisis as the worst crisis since World War II.

20:15, March 13, 2011, Sunday: Rough translation summary of CCS Edano's 19:50 press conference:

- Regarding Fukushima reactor No. 3, the water level has apparently stopped rising despite the continued pumping of sea water. When asked, he acknowledged that this could be a result of faulty gauges, but that in any case, the fuel rods could still be in an exposed state. He continued that work is continuing to fix the valve mechanism and to release some of the pressure in the reactor, and that there have been no changes in the radiation level. Overall, he cautiously concluded that although there is still a possibility of an explosion similar to the reactor No. 1 explosion, the situation, "might be slightly better than yesterday."
- When asked about the possibility of raising the consumption tax, Edano said that all possibilities to respond to the crisis are being considered, but that the GOJ is not at a stage to discuss specific measures. Edano also said that the GOJ may need to work with the Liberal Democratic Party (LDP) for changes to the legislative framework.
- Edano said that 10,000 people are missing in Miyagi, with searches continuing from the air.
- Edano said that there are problems getting enough food to coastal areas (most likely referring to the most directly affected areas), and that this is a high priority.
- Confirmed the planned power outages.

20:15, March 13, 2011, Sunday: Department of Energy (DOE) nuclear expert Alvin Remick has arrived in Tokyo and is headed to the Ministry of Foreign Affairs (MOFA) to join a 21:15 meeting with his Nuclear and Industrial Safety Agency (NISA) counterparts.

20:00, March 13, 2011, Sunday: Prime Minister Kan is currently holding a press conference, an overview of the statements will be provided in the next update.

19:58, March 13, 2011, Sunday: From the U.S. Consulate in Sapporo, two AMCITs in Sendai reported that an announcement was made that persons in the area should seek immediate shelter because a radiation cloud from the damaged nuclear reactors was approaching. There is currently no further information on what Japanese government organization made the announcement.

19:47, March 13, 2011, Sunday: French Political Counselor (Remi Lambert) attended a meeting of European Union (EU) country representatives at 15:00 this afternoon. There was much discussion of possible next steps

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19:45, March 13, 2011, Sunday: Mission Japan Emergency Command Center (JECC) will go live at 08:30, March 14 JST (1930 March 13, EDT) and will supersede previous contact information for Embassy Tokyo's 24-hour response. This does not change Embassy Consular Center or its contact information and is a parallel structure. We will send this information to OPS formally and in final form on March 15. We are providing this in advance so that OPS is aware of the impending change.

19:28, March 13, 2011, Sunday: Reactor Situation Overview – According to Yomiuri news, after the “Great East Japan Earthquake,” all 11 reactors at the Fukushima and Onnagawa NPPs (both in the heaviest hit region) were automatically shutdown. Out of the 11 reactors, only 3 reactors (Fukushima reactor No. 3 and Onnagawa reactor Nos. 1 and 3) were shut down in “Low Temperature Mode,” meaning that the reactor temperatures were under 100 degrees Celsius with pressure at atmospheric levels. Efforts to cool down the other reactors are ongoing.

19:20, March 13, 2011, Sunday: 1,000 Confirmed Dead; 310,000 Displaced - According the National Police Agency, the number of confirmed dead from the earthquake and tsunami has passed 1,000 and is expected to continue to rise. So far, at least 3,300 houses have been found completely destroyed, with another 21,000 partially or mostly destroyed.

18:58, March 13, 2011, Sunday: The Japan Meteorological Agency said there is a 70% chance of an aftershock of Magnitude 7 or greater occurring before the afternoon of March 16, with a 50% chance of such an aftershock between March 16 and March 19, according to Asahi.com. An increase in 0.2 in magnitude means that the amount of energy released in the earthquake is doubled, which makes the energy released in the earthquake 45 times stronger than the Kanto earthquake of 1923 and 1450 times stronger than the 95 Hanshin quake.

18:39, March 13, 2011, Sunday: According to NHK, TEPCO reported a partial meltdown may have begun in reactor No. 3 at the Fukushima NPP No. 1, as indicated by the presence of cesium in the atmosphere. According to TEPCO, the level of sea water in reactor No. 3 was low between approximately 1:00 PM and 3:00 PM, leaving two meters of the fuel rods exposed and causing a build-up of hydrogen gas. TEPCO is considering actions to reduce the hydrogen buildup and maintain the water level in the reactor.

18:36, March 13, 2011, Sunday: Minister Katayama told press the GOJ is considering delaying unified local elections (scheduled for next month) in areas affected by the earthquake and tsunami. Nagoya Consulate reported Nagoya City elections are proceeding as planned today.

18:35, March 13, 2011, Sunday: According to Kyodo news, Democratic Party of Japan (DPJ) and the Liberal Democratic Party (LDP) to discuss tax hike to secure funds for quake relief.

18:30, March 13, 2011, Sunday: Japan Meteorological Agency Press Conference - Although the tsunami warnings have been lifted as of 17:55, this does not mean that all wave activities have ceased. The Meteorological Agency advised residents to continue to exercise caution in coastal areas. In the case of another after-shock with a magnitude over 7, especially if the epicenter is off the coast, tsunami warnings are likely to be renewed.

18:30, March 13, 2011, Sunday: The GOJ lifted all tsunami warnings at 17:55.

18:30, March 13, 2011, Sunday: Consulate Nagoya reported all employees on the Boeing 787 team have been accounted for and operations are normal. To the Consulates best knowledge, all 3,000 or so Amcits in the Consular District are safe and accounted for.

18:24, March 13, 2011, Sunday: A Delta Airlines manager told us that Delta is "back to almost normal schedule."

18:18, March 13, 2011, Sunday: German Embassy on Voluntary Departure - According to German Political Counselor (Heike Fuller), the German Embassy has moved to voluntary departure at German government expense for Embassy families and non-essential Embassy personnel. According to Ms. Fuller, most if not all families who are eligible are availing themselves of this offer. The German school is closed all next week; many German business people have already departed. A German team is headed to the Sendai/Tome area soon to help with rescue/welfare and whereabouts. Germany has 80-100 nationals in the wider, immediately affected area.

18:12, March 13, 2011, Sunday: DART Teams Arrive - MOFA confirmed 150 members of two Disaster Assistance Response Teams (DARTs) from USAID arrived at Misawa Air Base in Aomori Prefecture on their way to conduct rescue operations in Ofunato, a severely damaged coastal city in neighboring Iwate Prefecture. The U.S. squads, with six rescue dogs each, will work with Tokyo Fire Department rescue workers, the ministry said.

18:04, March 13, 2011, Sunday: Media reported that, due to the appearance of several cases of radiation exposure amongst evacuees from the 20 km zone around Fukushima No. 1 Nuclear Power Plant (NPP), the Fukushima Prefectural Government has decided to check/screen/frisk ALL evacuees for radiation exposure. The Prefectural Government has asked the GOJ for assistance to screen the large number of evacuees spread-out over about 480 evacuation facilities/areas.

17:51, March 13, 2011, Sunday: Onnagawa Reactor Stable - NHK reported the high radiation levels previously detected at the Onnagawa Reactor, located about 100km northeast of the Fukushima Plant #1, may have been a result of radiation from the Fukushima reactors. According to Tohoku Power, the Onnagawa Reactors were shut down automatically after the earthquake and remained at a stable temperature. In addition, the levels of radiation measured from detectors located in the waste outlets of the Onnagawa Reactors are quite low - 5.7 micro Sv, or about 1/10th the amount usually received during a chest x-ray.

30 More People Found with Radiation Exposure - Yahoo News Japan reports that 30 more people have been found with possible exposure to radiation, including 19 workers evacuated by helicopter from a hospital in Fukushima Prefecture, 9 people evacuated by bus from the same town, and 2 officials who were dispatched to monitor radiation levels in Niigata Prefecture. Approximately 100 people had been evacuated by bus from Fukushima, but only a portion were scanned for radiation, raising the possibility that the number of people potentially exposed to radiation could increase.

17:51, March 13, 2011, Sunday: The outgoing USARJ liaison officer to the JGSDF Northeast Army (NEA) in Sendai stated there is a dwindling availability of food and water, absence of utilities, absence of CBRNE capability in the NEA, and signs of structural damage in downtown Sendai (i.e. vulnerability to aftershocks, need for more construction engineering assets).

17:46, March 13, 2011, Sunday: Defense Minister Kitazawa, General Field, General Oriki, and Embassy's Political Minister Counselor Luke are slated to fly up to Sendai on Monday (March 14) to mark the inauguration of the Disaster Relief Joint Task Forces Headquarters, at the Northeastern Army Headquarters in Sendai. They also plan to get an aerial view of some of the disaster hit areas in the region.

17:42, March 13, 2011, Sunday: Update on coverage of USFJ response:

- Media reported that helicopters from NAF Atsugi are headed for Rikuzen-takada City in Iwate Prefecture to start transporting over 640 displaced/stranded persons to hospitals and/or proper shelter facilities
- TV News showed footage of the USS RONALD REAGAN on-scene and explained food delivery ops had begun with JMSDF helicopter & JS TOKIWA. the news analyst mentioned that the RONALD REAGAN was diverted from its original course en route the Middle East.
- Media covered the movements/intentions of USS BLUE RIDGE (from Singapore), USS ESSEX (with USMC from Okinawa), USS TORTUGA (after picking up heavy-lift helos from ROK), USS COWPENS, USS JOHN S. MCCAIN, and other ships.
- The tone of the commentary was that these actions show the U.S. seriously cares and is putting great effort in the ops to help Japanese.

17:26, March 13, 2011, Sunday: Mitsubishi and Suzuki will be closing all of their car factories on March 14 and 15. Although their factories in Aichi, Gifu, and Okayama were not damaged, their supply lines from NE Japan were affected. Sony announced it will send 30,000 radios to affected areas as well as 300,000,000 yen (about \$3.6 million) in aid.

17:00, March 13, 2011, Sunday: Rough translation summary of CCS Edano's 17:00 press conference:

- In response to the high possibility of power shortages after March 14, the GOJ is creating a new Office of Energy Needs, which will be headed by DPJ Diet Member Renho.
- Volunteer work will be coordinated through a new Volunteer Coordination Office, which will be headed by Diet member Kiyomi Sujimoto. Edano remarked that Sujimoto is well qualified for his role due to his personal experience in the great Kansai Earthquake.
- Edano pledged to increase efforts to ensure that foreigners living in Japan will get the latest news.
- A second meeting to assess the economic effects of the earthquake will be held starting in the afternoon of March 13th, to run until the evening.

17:00, March 13, 2011, Sunday: Kyodo news misreported, as covered in our 15:39 report, Edano's statement regarding a hydrogen blast at the No. 3 reactor. There was NOT a blast at the No. 3 reactor. Edano stated that there was only the possibility of a blast at the No. 3 reactor, similar to the blast seen at the No. 1 reactor.

16:57, March 13, 2011, Sunday: The Commercial 767 flight carrying Urban Search and Rescue (USAR) personnel has landed in Misawa at 0622z. USA 2 (a cargo flight) has arrived via DoD C-17 in Misawa at 0005z. USA 1 (a cargo flight) departed Andrews Air Force Base in a DoD C-17 and is currently airborne. DoD is reporting an updated estimated arrival time of 13 March 1438z (Local time in Japan 2338). An aerial refueling is scheduled for this flight, which will help shorten their flight time.

16:45, March 13, 2011, Sunday: CCS Edano is currently holding a press conference, an overview of the statement will be provided in the next update.

16:25, March 13, 2011, Sunday: Local media reported that two USN helicopters, operating from USS RONALD REAGAN, are working with JMSDF to deliver 30,000 meals to Kesenuma Town, Miyagi Prefecture. Meals are aboard JMSDF AOE, JS TOKIWA, and USN & JMSDF helos are doing round-robin flights to get the large amount of food ashore.

16:19, March 13, 2011, Sunday: GOJ spokesman Chief Cabinet Secretary Edano reported that TEPCO began pumping sea water into the No. 3 reactor at Fukushima #1 Power Plant (as they began doing Saturday night in the No. 1 reactor). He added that an explosion, like the one that occurred in the No. 1 reactor on Saturday, was possible but said the reactor container could resist such a blast and a meltdown is not expected.

16:02, March 13, 2011, Sunday: According to NHK news, Miyagi Police Headquarters representative Naoto Takeuchi announced the death toll in Miyagi Prefecture will almost certainly reach 10,000. Takeuchi said that as of the afternoon of March 13, Miyagi officials had taken in 379 bodies.

1547, March 13, 2011, Sunday: According to Kyodo news, a U.S. rescue team arrived at Misawa base in Aomori.

1542, March 13, 2011, Sunday: The following are the latest bullets from the Bilateral Joint Ops Coordination Center:

- Japan Air Staff Office - Takada City 640 persons need evacuation, approved by Joint Staff Office J3 for USFJ execute SAR mission from Atsugi with 8 helicopters H-60
- USS Ronald Reagan has rescued someone and is aboard ship...awaiting details
- Joint Staff Office reports helos from Reagan have done 20 missions to/fm Japanese ships and delivered food and supplies to 3 different towns
- At Yokota 3 Helicopters H60 standing by for mission assignment
- More forces flowing in to Marine Corps Base Iwakuni

1539, March 13, 2011, Sunday: According to Kyodo news, CCS Edano announced in a press conference that a hydrogen blast possibly occurred at the No. 3 reactor of Fukushima number one NPP. Edano reported that part of the No. 3 reactor could be deformed but claimed it is not in a meltdown situation. If an explosion occurs, said Edano, the No. 3 reactor can resist the explosion, as was the case when the No. 1 reactor exploded. Edano said if such an explosion occurs there would be no detrimental effect on evacuees.

1532, March 13, 2011, Sunday: According to TBS news, Tohoku-Denryoku reported that, as of 10am, there were close to 1,780,000 homes without power in all of Miyagi Prefecture and parts of Aomori, Iwate, and Fukushima. Moreover, there were nearly 270,000 homes without power, mostly in the Ibaraki Prefecture. Japan gas reported that 445,000 homes do not have a supply of gas.

1529, March 13, 2011, Sunday: According to Kyodo news, the current Diet session has been suspended.

1524, March 13, 2011, Sunday: According to Kyodo news, the opposition LDP has urged the Kan government to step up rescue efforts.

1520, March 13, 2011, Sunday: According to NHK news, METI Minister Kaieda implored citizens to conserve energy due to the diminished power supply caused by the shutdown of several nuclear power plants after Friday's earthquake. He has consulted with business groups, including Keidanren, to minimize industrial usage of electricity. Kaieda asked the public to refrain from using energy as much as possible, including for heating and lighting at night. If these measures prove insufficient, the government may have to resort to rolling power shutdowns.

1516, March 13, 2011, Sunday: According to TBS news, radiation measured at 21 micro Sv per hour was detected at Onagawa nuclear power plant in Miyagi Prefecture, which is 400 times the normal radiation level. However, the radiation measurement at the exhaust tower was normal, and therefore, it is expected to be caused by the Fukushima plant. According to NHK, Tohoku Electric Power Company denied it was caused by Onagawa NPP and explained that all three reactors at Onagawa were already cooled and shut down safely.

1511, March 13, 2011, Sunday: American Airlines has informed the Embassy that it would like to continue service to Japan but the lack of information is causing AA to "seriously reconsider" whether to suspend service.

1510, March 13, 2011, Sunday: According to Sankei news, the National Police Agency announced that there were 801 deceased, 733 missing, and 1,442 seriously injured.

1457, March 13, 2011, Sunday: According to Kyodo news, there was radioactivity measured at 400x normal level observed in Miyagi.

1448, March 13, 2011, Sunday: According to Sankei news, NISA announced today that there were approximately 160 people exposed to radiation around the Fukushima Daiichi nuclear power plant. All of the individuals are expected to be tested.

1432, March 13, 2011, Sunday: According to Kyodo news, METI Minister Kaieda will hold a press conference at 15:00.

1432, March 13, 2011, Sunday: According to Jiji News Service, the Bank of Japan on Monday, March 14 is expected to provide a several trillion yen short-term cash infusion to stabilize financial markets. The stock market plummeted in the aftermath of the earthquake, and financial turmoil is expected to continue in the short-term. Banks are undertaking special measures to provide cash to account holders. The BOJ is expected to continue its zero interest rate policy.

1418, March 13, 2011, Sunday: According to Kyodo news, police reported that the number of people dead or missing exceeded two thousand, while the death toll neared 800. There were close to 1,167 people missing in Fukushima Prefecture and approximately 600 deceased in the Iwate and Miyagi Prefectures. Local officials said that local governments are unable to contact tens of thousands of people, and at least 20,820 buildings have been at least partially destroyed in the quake-hit areas. Twenty two people have been exposed to radiation near the Fukushima number one plant. In Iwate Prefecture (north of Miyagi), nearly five thousand homes had been submerged by the tsunami, and the local office reported that only 5,900 of 23,000 people had taken shelter. Japan's Maritime Self Defense Force reported early Sunday sightings of wood fires at seven locations in Miyako.

1414, March 13, 2011, Sunday: According to Kyodo news, PM Kan is discussing the nuclear plant crisis with the head of TEPCO.

1410, March 13, 2011, Sunday: According to Kyodo news, a radiation monitor was set up in Ibaraki Prefecture (south of Fukushima Prefecture), and there are no abnormal readings thus far.

Correction to the 13:00 report : According to Kyodo news, the number of people deceased or unaccounted for exceeded 2,000, according to policy, and the official death toll neared 700. In Fukushima Prefecture, there were 1,167 people missing and over 600 dead in Fukushima and Miyagi prefectures. (Earlier report incorrectly stated Miyazaki rather than Miyagi Prefecture.)

1405, March 13, 2011, Sunday: According to Kyodo news, PM Kan asked Toshiba Corporation to send experts to assist with the nuclear plant crisis.

1403, March 13, 2011, Sunday: According to Sankei news, PM Kan will meet with LDP leader Tanigaki to discuss how to address the unfolding situation.

1403, March 13, 2011, Sunday: According to Kyodo news, the local elections in April in the quake-hit region will be postponed.

1402, March 13, 2011, Sunday: According to Kyodo news, the U.S. aircraft carrier Ronald Reagan is arriving off the coast of Northeast Japan to assist in relief operations in cooperation with Japan Self Defense Forces.

1350, March 13, 2011, Sunday: According to TBS news, TEPCO reported that the cooling system has not been functioning at Fukushima's #2 reactor. TEPCO will begin to emit steam that contains slight radiation from the container vessel to reduce the pressure, although the timing has not been specified. All operating reactors from #1 to #3 of Fukushima number one NPP are having the same problems.

1347, March 13, 2011, Sunday: DCM comments based on a conversation with DCCS Kawai:

(b)(5)

1342, March 13, 2011, Sunday: According to TV Tokyo, there is limited water and helicopter rescues have been continuing since yesterday at Kesenuma City, Miyagi Prefecture.

1338, March 13, 2011, Sunday: According to MOFA, China's National Earthquake Bureau (rough translation) sent a team of 15 persons to conduct search and rescue operations. The team arrived at Haneda today at 12:30pm and is en route to Tokyo. Their final destination has not yet been determined. The PRC military is not involved; this is purely a civilian operation at this point. MOFA indicated that an official announcement will post on MOFA's homepage soon.

1335, March 13, 2011, Sunday: According to TBS news, Germany and Switzerland sent rescue teams that will be arriving at Narita airport at an unspecified time. China and the United Kingdom also sent assistance teams.

1334, March 13, 2011, Sunday: According to TV Tokyo, there is no water, electricity or food in Rikuzen-Takata, Iwate Prefecture. People have begun cutting down trees for heat and food. Several buildings sheltering refugees were flooded causing many deaths. The Ground Self Defense Force is now on site for rescue operations.

1332, March 13, 2011, Sunday: According to NHK news, the following are conditions at Aomori Prefecture: Casualty reports in Aomori Prefecture are limited to three dead and one missing in Hachinohe (on the Pacific coast) as a result of tsunamis; all four are Japanese nationals. Toll roads are open within the prefecture but not going south into Iwate or Akita Prefectures. There are 42,000 households without power in Misawa and Hachinohe. There are 1,300 households without gas in Hachinohe. NTT reports no restrictions on phone use, but many circuits are overloaded due to heavy call volume.

1259, March 13, 2011, Sunday: According to Yomiuri news, approximately 10,000 residents of Minami Sanriku in Miyagi Prefecture remain missing. In Iwate Prefecture, the mayor of Otsuchi said that more than 10,000 residents also remain missing. Many of the residents of Yamada with a population of 19,000 in Miyagi are missing. In Fukushima Prefecture, the number of missing has risen to 1,167.

1232, March 13, 2011, Sunday: Official message from Ambassador Roos to American Citizens in Japan: "The U.S. Government is communicating closely with the Japanese Government on events as they unfold. We have and will continue to mobilize all appropriate resources. The U.S. Government and all necessary experts are fully engaged in analyzing the issues, including the Fukushima reactor issues, in close consultation with the Japanese Government. We are committed to providing you with all necessary information as we receive it. There is no double standard – what we advise our Embassy personnel will be provided to all Americans.

Please understand that there will continue to be substantial misinformation in the public. We urge American citizens in Japan to follow the instructions of Japanese civil defense authorities. The Japan Nuclear Industrial Safety Agency (NISA) has recommended that people who live within 20 kilometers of the Fukushima Nuclear Power Plant in Okumacho evacuate the area immediately. No other evacuations have been recommended."

1223, March 13, 2011, Sunday: According to Nippon TV, Japan Meteorological Agency changed the magnitude of the earthquake from M8.8 to M9.0.



1215, March 13, 2011, Sunday: According to Kyodo news, the number of people deceased or unaccounted for exceeded 2,000, according to police, and the official death toll neared 700. In Fukushima Prefecture, there were 1,167 people missing and over 600 dead in Fukushima and Miyazaki prefectures. Moreover, local governments are unable to contact tens of thousands of people, according to police and local officials. In Miyagi, close to 4,400 people remained trapped as of Saturday night in schools, hospitals, and hotels in the towns of Onagawa and Ishinomaki, as well as at the Onagawa nuclear plant. Nearly 10,000 people in Minamisanriku remain unaccounted for. PM Kan issued an instruction to double the number of Self-Defense Force personnel in the quake areas to 100,000. The government issued a decree late Saturday designating the disaster eligible for increased state subsidies for reconstruction.

1205, March 13, 2011, Sunday: According to TBS news at 1200, the Fukushima Government reported that 22 people had been affected by radiation from Fukushima number one nuclear power plant. The Fukushima Government has requested that the central government dispatch experts on decontamination.

1155, March 13, 2011, Sunday According to Kyodo news, TEPCO notified Japan's nuclear safety agency that the radiation level at the Fukushima No. 1 nuclear power plant exceeded the legal limit and that hourly radiation at the site was measured at 882 micro sievert, in excess of the allowable level of 500. The agency also said the company acknowledged that the No. 3 lost its cooling functions, while 19 people at a nearby hospital were found to have been exposed to radioactivity, in addition to three cases of exposure recorded Saturday. The utility supplier notified the government early Sunday morning that the reactor had lost the ability to cool the reactor core. The reactor is now in the process of releasing radioactive steam, according to top government spokesman Yukio Edano. It was the sixth reactor overall at the Fukushima No. 1 and No. 2 plants to undergo cooling. The government and nuclear authorities said there was no damage to the steel container housing the troubled No. 1 reactor, noting that the blast occurred as vapor from the container turned into hydrogen and mixed with outside oxygen.

1138, March 13, 2011, Sunday According to NHK, the following are conditions in Miyagi Prefecture: NHK local bureau reported lists of medical facilities and schools/community centers where water is available in Sendai, as well as bank branches that will open on Sunday to allow limited cash withdrawals up to 100,000 yen. Local fire department rescue efforts continued through the Saturday night/Sunday morning, including by boat and helicopter, with a focus on people stranded at Sendai airport and on the roofs of buildings in flooded communities.

1138, March 13, 2011, Sunday According to NHK, the following are conditions in Iwate Prefecture: Tohoku Electric Power reported 500,000 households with no power, but supply is gradually being restored to Morioka, Hanamaki and other inland population centers. 750,000 households are without water in inland Iwate. All commercial flights to Hanamaki Airport in southern Iwate are cancelled, but the airport will be used for relief efforts. Toll road highways are restricted to emergency vehicles only.

1136, March 13, 2011, Sunday Chief Cabinet Secretary Edano announced at a press conference at 1100 that a cooling water supply system was out of order at the number three reactor at Fukushima's number one nuclear power plant, and the water level in the container vessel was becoming lower. It is expected that a nuclear fuel rod had been exposed. The safety valve of the vessel opened as of 0905 and water started was injected into the vessel with boracic acid. TEPCO started at 0920 to emit water vapor which contains slight radiation from the container vessel. TEPCO monitors the radioactive level of the environment. The level of the gate at 05:30 has been shifted such as 44.6 microSv, 37.0 at 6:00, 1204.9 at 8:23, 76.9 at 9:20, 70.3 at 9:30. Kyodo press also reported, based on Edano's press announcement, that the radiation level at Fukushima plant briefly reached 1,204 micro sievert. The level is not stable, but the emission of contaminated air is under control and not expected to be a health risk. The GOJ will organize in cooperation with local governments to establish stations to assess radiation levels for residents.

1129, March 13, 2011, Sunday As of Saturday at 2051, Japan Railway Bureau Security (MIKAMI) reports that with the exception of the tsunami affected area, rail and metro service are generally back in service.

1123, March 13, 2011, Sunday According to NHK, TEPCO announced at 10:50 that the level of radiation surpassed the legal limit at Fukushima's number one reactor and submitted to the government an emergency alert at 9:01am. According to NHK, TEPCO assesses that the process of removing air from the pressurized containers of the reactors that lost their cooling functions led to the increase in the level of radiation.

1109, March 13, 2011, Sunday According to NHK, NISA reported as of Sunday 10:00 that the number three reactor lost all of its cooling function and is in a "critical state," as are the plant's first and second reactors. NISA reported it has yet to confirm whether or not the process of pouring water into the reactor has taken place. Regarding the number one reactor, the process of pouring sea water into the reactor is almost complete, but NISA inspectors need to perform an on-site inspection to determine if that is the case.

1100, March 13, 2011, Sunday According to NHK, the Japanese government rates the accident at the Fukushima Number One nuclear power plant at a level 4 on an international scale of 0 to 7. A level 4 on the International Nuclear and Radiological Event Scale includes damage to fuel and release of significant quantities of radioactive material within an installation. It's the same level as a critical accident at a nuclear fuel processing plant in Tokai Village in Ibaraki Prefecture, south of Fukushima, in 1999. Two radioactive substances, cesium and radioactive iodine, were detected near the Number One reactor at the plant on Saturday. Their presence indicates nuclear fission of uranium. NISA said that fuel in the reactor partially melted. It's the first such accident in Japan.

1050, March 13, 2011, Sunday As of 12 March at 2042, all morning flights at Narita are scheduled to depart on-time or with slight delays as they try to accommodate as many passengers as possible. Flights are also arriving into Narita as well with just a small handful of delays which were scheduled to arrive last night. As of right now only AA176 to DFW @ 1200 has been cancelled and as far as I know there are no extra flights being added to accommodate extra passengers. So far the evening flights are scheduled to depart at or around the scheduled times. According to the Haneda airport website, flights are departing with the two morning US departures being slightly delayed. The evening flights appear to be scheduled to depart on-time.

1042, March 13, 2011, Sunday According to Kyoto news, Chinese emergency response team expected to arrive in Japan on Sunday afternoon.

1037, March 13, 2011, Sunday According to Kyoto news, TEPCO announced that radiation levels exceeded the legal limit at Fukushima's number one reactor.

1026, March 13, 2011, Sunday According to NHK news, there was a 6.4 earthquake (Japanese standard) off the coast of Ibaraki.

1000, March 13, 2011, Sunday According to a NISA press conference, the number one reactor at Fukushima is not in a "serious situation" and the number three reactor should be controlled, providing the necessary steps are taken.

1000, March 13, 2011, Sunday Jason Lawrence and Jeremy Mears have assumed charge at Tokyo Task Force. Direct all email to them vice Lee and Ryan as of 1000.

0950, March 13, 2011, Sunday According to NHK news, CGS Edano announced in his press conference at 0800 that a total of 210,000 living in the areas surrounding nuclear reactors one and two are in the process of being evacuated.

0945 TV Tokyo called, stating that they were aware of a U.S. rescue going to Sendai and wanted to accompany the team to video their efforts. The call was directed to Lori Schumaker in PAS.

0943 Phone call from Mark Dieker from Fukuoka Consulate, presenting use of aircraft from Futenma that has landed at Iwakuni. Dieker will send an email and contact POL-MIL. Tokyo Task Force also informed POL-MIL duty officer.

0940 According to multiple news reports, Defense Minister Kitazawa said he is increasing the number of Self-Defense Forces dispatched to assist in the rescue effort to 100,000 and will visit the disaster area along with SDF Chief Orike.

0904 Chief Cabinet Secretary Edano conducted an interview with NKH. During the interview (rough translation), he called for cooperation and assistance from the private sector, especially for medical and tracking assistance. He noted that it was too early to forecast how long the evacuation in the area surrounding Fukushima plant would take. He commented on funding for the disaster relief, in the medium and long term, a supplemental budget would be necessary. In the current budget, there is approximately 200 billion yen (approximately \$2.5 billion USD) available, but they also needed to allocate money in next year's budget for the efforts. Edano pledged to send temporary shelters to whoever needed them. Regarding the plan to unify local elections, Edano said that they will likely be postponed, but such a postponement cannot be decided upon unilaterally by the ruling party and asked for the cooperation of all parties.

0844 According to Nikkei online, the Japanese National Police Agency reported 689 dead in 12 prefectures included Iwate, Fukushima, Miyagi, Ibaraki, Chiba, Tokyo and others. 639 people are still missing in 6 prefectures. 1,570 people are injured.

0837 The U.S. Nuclear Regulatory Commission (NRC) is dispatching two individuals to join a rescue team in Japan, potentially the DART team, to arrive at Misawa on 13 March. The NRC team will be

forward deploying radiation detection equipment, although the Japanese government has not clarified whether or not it will need them. The USFJ has requested that the NRC team be put in touch with J3 and J2 upon their arrival.

0830 According to a Kyodo news advisory on their English-language website, another nuclear reactor is in the process of releasing radioactive steam, according to Chief Cabinet Secretary Edano.

0810 Chief Cabinet Secretary Edano conducted a press conference, reporting (approximate translation) that they completed the process of filling Fukushima Number One with sea water but have not been able to confirm that the temperature was lowered. Edano added that 9 citizens in the vicinity of the site were exposed to radiation, 5 of which had been exposed to radiation under 1800 cpm and the remaining 4 had been exposed above 1800 cpm, to include one individual who was exposed at approximately 40,000 cpm. In addition, 114 citizens are still within 10 kilometers of the nuclear site, consisting of incapacitated individuals at hospitals. Approximately 180,000 people who were within 10-12 kilometers of the site are being evacuated.

0804 A conference call concluded at 0644 between the OPS CENTER, ACS Chief Bill Christopher, ECON Chief Mark Wall, DHS, NRC, CBP, TSA, HHS, EAP/J and others. The purpose of the conference call was to come up with advice to Americans for a travel alert. There will be a follow-up conference call to discuss advice that can be given to Americans in Japan, those wanting to travel to Japan, and to airlines. ACS chief reported that the 4 GE employees and the rest of that group were surveyed and found NOT contaminated. DOS confirmed that they were NOT on the no fly list.

0756 According to a Kyodo news advisory on their English-language website, 15 people near the Fukushima Power Plant have been exposed to radiation.

0737 According to Jiji Press, the Meteorological Agency lowered the tsunami warning in Aomori, Fukushima and Iwate Prefectures by one level.

0729 The National Police Agency reported official statistics of 688 deaths, 1570 injuries, and 642 missing persons in 12 prefectures in Tohoku and Kanto region, according to Sankei news.

0656 According to Sankei Online, NISA reports that up to 160 people may have been exposed to radiation from Fukushima Number One Power Plant. All 160 people will be tested for radiation exposure.

0639 According to NHK online news (approximate translation), at approximately 0600, reactor III at Fukushima reported a state of emergency. TEPCO said that the equipment sending water to the reactor had stopped and that they have been unable to send water via another method. TEPCO declared a state of emergency based on the special measures law on nuclear disaster counter-measures. This was the 6<sup>th</sup> reactor for which they have issued this state of emergency as a result of the earthquake.

0625 Luis Mendez from Task Force-I at the State Department, asked for an update on GE employees. Embassy Task Force contacted Tim Cipullo, who only had a brief email update from consular about the employees. Task Force contacted Richard Roberts who indicated that Bill Christopher was on a conference call at the moment with Washington and would address the issue directly with them.

0620 According to a 0530 article on Jiji news, the government announced a Cabinet decision designating the earthquake as a severe disaster. In doing so, the government will be able to allocate funds directly to disaster relief in the affected areas.

0610 Embassy Task Force received a call from Heather Dresser of EAP/J requesting an Embassy Econ Officer participate in a conference call immediately regarding the nuclear issue. Embassy Task Force contacted Mark Wall at home and given the call-in information for the conference call.

0600 According to an online NHK report (approximate translation), disaster relief teams from South Korea and Singapore arrived in Japan on 12 March. On the morning of the 13<sup>th</sup>, U.S. disaster relief teams were also expected to arrive at Misawa base in Aomori prefecture in addition to the U.S. military sending nuclear aircraft carrier Ronald Reagan and other vessels to the disaster area and will assist them by providing supplies using helicopters and landing craft. As of the 12 March, a 40-person German search and rescue team had departed. The United Kingdom had also dispatched a 63-person search and rescue team and dogs on the evening of the 12 March. France announced that they are sending 2 teams which were expected to depart for Japan on the 12<sup>th</sup> as well. China also indicated they would send a 10-person rescue team to Japan. The United Nations decided to dispatch a disaster evaluation and coordination team which would arrive after 13 March. Russian President Putin held a ministerial meeting and expressed Russia's desire to assist Japan, given that it was a regional partner, and instructed that they begin to make preparations to begin increasing the supply of LNG to Japan, as reported previously below.

0545 At a press conference broadcast in Japanese that began at approximately 0540, NISA's representative said that they completed the initial stages of pumping sea water into the containment vessels of the reactor to stabilize the situation, although additional cooling efforts still remain. In addition, they have vented additional elements of the reactor to release pressure.

0543 The Japanese Ministry of Foreign Affairs (MOFA) invited local diplomatic missions at 1139 on 12 March to attend a briefing on the Fukushima Daiichi Nuclear Power Plant, presented by Mr. Makio Miyagawa, Director-General, Disarmament, Non-Proliferation and Science Department, Ministry of Foreign Affairs, on 13th March 2011 at 1000 at MOFA.

0456 According to Kyodo news, Russia will boost natural gas shipments to Japan if requested by Tokyo. Russian Deputy Prime Minister Igor Sechin announced that Russia can send up to 150,000 tons of LNG to Japan.

0454 NHK TV reports that they continue to pump sea water into the reactor.

0445 Kyodo News reports that nuclear agency officials said the severity of the radioactive leak this time is around the same level as a 1999 accident at a nuclear fuel processing plant run by JCO Co. in Tokaimura, Ibaraki Prefecture, in which a nuclear fission chain reaction could not be contained for nearly a full day.

0430 According to Nihon television news, NISA indicated that 3 citizens have been exposed to radiation, having been tested with survey monitors. In addition, 50-100 people who were evacuating the area may also have been exposed to radiation and are being tested.

0400 According to NHK (informal translation), the Ministry of International Trade and Industry (METI) Nuclear and Industrial Safety Agency (NISA) announced that the accident at Fukushima Number One Power Plant is a "level 4," which was as bad as the accident which occurred 12 years ago at Tokaimura, Ibaraki Prefecture.

0400 Jerome Ryan and Ti-Ying Lee have assumed charge at Tokyo Task Force. Direct all email to them vice Hotz as of 0415

0351 Kyodo News reports Japan's nuclear safety agency admitted the reactor had partially melted—the first such case in Japan

0345 Consular Reports CA-Task Force will convene a conference call including Tokyo Cons/Econ participation to discuss Fukushima issue. Timing of the call will depend on resolution of a question that has arisen regarding potentially contaminated GE employees and whether the possibility of contamination may have place them on no-fly list. CA Task Force is addressing resolution of that issue.

0320 Consular Team to Sendai : A four-person (2 Conoff, 2 LES Consular Specialists) Embassy Tokyo Consular away team will depart for Sendai March 1. Expected departure planned for noon. Final departure time contingent on milair lift arrangements. Embassy vehicle support will meet team there.

0315 South Korean rescue team arrives at Haneda: A South Korean rescue team has arrived at Tokyo's Haneda Airport. It is the first foreign assistance since the strongest ever earthquake hit Japan's northeast. A team of 5 South Koreans and 2 rescue dogs belonging to Korea's National Emergency Management Agency arrived at Haneda Airport on a civilian flight shortly before 3PM on Saturday. State Secretary for Foreign Affairs, Chiaki Takahashi, received the team at the arrival lobby, and shook hands with the members. Takahashi said he is grateful to President Lee Myung Bak, and asked members to take care, as aftershocks are continuing in the affected areas. The leader of the rescue dog team said they are a small but experienced unit, having worked in Indonesia and Haiti after they were hit by major earthquakes. He said the team will do its best. More units may be dispatched from South Korea, depending on the situation (Source: NHK)

#### 0300, March 13, 2011, Sunday

0225 Sea water used for cooling down the reactor (NHK Report)

The Tokyo Electric Power Company is using sea water as an emergency coolant in its quake-damaged reactor at Fukushima Number One Power Plant. The massive earthquake on Friday caused a breakdown of cooling systems that could cause temperatures in the reactor to rise to uncontrollable levels. Chief Cabinet Secretary Yukio Edano disclosed on Saturday that the company is pouring sea water into the containment vessel of the reactor. Sea water is readily available as the plant is close to the sea. Edano said the company is mixing boric acid with the water to help absorb neutrons to slow nuclear fission. Edano added that government's Nuclear and Industrial Safety Agency has endorsed the procedure. Self-Defense Force troops, who are actually in charge of the cooling process, are using pump trucks and other methods to inject the sea water. They say the work started on Saturday evening will be completed on early Sunday.

Sunday, March 13, 2011 01:03 +0900 (JST)

0215 Ibaragi Prefecture (next to Fukushima prefecture) announced it has 552,000 iodine tablets in stock and is coordinating with the Ministry of Economy, Trade and Industry (METI) on the possible distribution in Fukushima.

(Source: Sankei)

0200, March 13, 2011, Sunday

0140 The Urban Search and Rescue (USAR) Teams arriving in Japan will also be accompanied by five journalists from three US media organizations. The organizations are noted below. The Public Affairs Officer herding the media is Chief Dave Stone. His contact number is (b)(6) and his US mobile number is (b)(6). (He believes this number will work in Japan. Names/affiliations of the journalists coming with the USAR team: CBS - Whitney DeHart, AFP - Nicholas Kamm, CNN - Brian Todd, CNN - Dugald McConnell, CNN - Douglas Schantz (ABC dropped out at the last second but will be working to meet up with the USAR teams in the field.)

0130 Seawater Cooling Efforts at Fukushima No 1 – At a press conference beginning at approximately, 0130 March 13, NISA states that sea water cooling efforts at Fukushima No 1 are continuing. Gist (not formal translation) is that pressure inside the reactor is down; radiation did not rise; appears more stable. The four workers injured in the turbine explosion earlier in the day are still being treated.

0100, March 13, 2011, Sunday

0045 USAID Press Release

US Search and Rescue Teams Depart for Japan

WASHINGTON, D.C. – At the request of the Government of Japan, the U.S. Agency for International Development (USAID) has deployed Urban Search and Rescue (USAR) teams from Fairfax County and Los Angeles County to assist in the rescue effort in the aftermath of the earthquake and tsunami in Japan.

The USAR team from Fairfax County has now departed Washington, DC via commercially chartered aircraft. The flight will stop in Los Angeles to meet that rescue team and then continue on to Japan. The U.S. rescue teams, comprised of approximately 150 personnel and 12 canines trained to detect live victims, are scheduled to arrive on the morning of March 13 in Misawa, Japan. Upon arrival, the teams will immediately begin the search for live victims alongside the Japanese and international search and rescue teams.

USAID's Disaster Assistance Response Team (DART) is already in Japan and working to coordinate the overall U.S. Government response effort. USAID will continue to provide additional support to the Government of Japan as needed.

For more information about USAID's emergency humanitarian assistance programs, please visit: [www.usaid.gov](http://www.usaid.gov).

0040 JR (Japan Railroad) lines announced the cancellations for several bullet train lines (shinkansen) and regular lines for March 13 - Tokoku Shinkansen, Yamagata Shinkansen, Akita shinkansen, Mito line, Nikko line, Toriyama line, Narita line, Kashima line.

2330 International Atomic Energy Agency (IAEA) says that Japanese government plans to distribute stable iodine, a treatment to prevent radiation poisoning, to residents near the Fukushima No 1 and No 2 nuclear power plants

(Source CNN)

2315 NHK is reporting that efforts to cool the No 1 reactor at Fukushima with seawater are expected to be completed at 0100 local time, March 14. (1100 hrs, EST, March 13)

2250 Kan vows to protect residents: Prime Minister Naoto Kan says he will do his utmost to safeguard the health of residents near the unstable Fukushima No.1 nuclear power plant. At a news conference on Saturday, Kan said unexpectedly powerful tsunami waves interfered with the operation of back-up systems when the plant's operations were halted. The prime minister said he had decided to expand the evacuation area around the nuclear plant from 10-kilometer radius to a 20-kilometer radius. Kan added he would take all necessary measures and do his utmost to keep residents from harm.

(Source: NHK)

2245 Fukushima No 1 Summary from Tokyo LES Staff: At a press conference at 9:30 pm, CCS Edano said that there was no damage in a container vessel at No.1 reactor of Fukushima Np.1 NPP. REPCO started to use seawater to cool No. 1 reactor although the reactor may get damaged.

2220 Transportation Update: According to regular Tokyo American Airlines contacts report diverted aircraft from yesterday's operations either have or are landing at NRT this evening. Only two of American's usual 6 daily flights are in operation with both are departing from NRT in the 2000 hour. At present, American expects to be back to normal with Monday's flight operations.

Operational update as follows:

AA 61 DFW NRT (Sapporo Diversion) arrived at NRT 1837  
AA 169 LAX NRT (Sapporo Diversion) arrived at NRT 2000  
AA 175 DFWNRT (Osaka Diversion) arrived at NRT 1839  
AA 153 ORDNRT (ANC Diversion) arrived at NRT 2050  
AA 135 JFKHND (ANC Diversion) arrived at HND 1919  
AA 167 JFKNRT (Yokota / HND Diversion) arrived at NRT 2055

The following flights departed NRT tonight (Sat 12 March):

AA 60 NRTDFW ETD: 2010  
AA168 NRTJFK ETD: 2000

Tomorrow (Sunday 13 March) we are planning to operate the following schedule:

AA 134 HND JFK ETD: 064  
AA 154 NRT ORD ETD: 1805  
AA 60 NRT DFW ETD: 1805



AA 170 NRT LAX

ETD: 1600

The only cancellation will be AA 176 NRT DFW due to no equipment at NRT.

There are still approx 5,000 passengers stranded at NRT, however, the airport operations have stabilised and American expect this number to drop significantly by Monday. The biggest challenge that remains is transportation access to the airport with major highways still closed and public transportation limited although improving by the hour. American normalised operations by Monday or Tuesday at the latest.

2210, March 12, 2011, Saturday

2200 Ray Hotz ([hotzre2@state.gov](mailto:hotzre2@state.gov)) assumes charge of Embassy Tokyo Sitrep Room (Daly Hall) until.

2155 Twitter tweets (in Japanese) report 3 persons have been exposed to radiation and that 90 will be tested by authorities.

2150 Transportation update - According regular Tokyo ECON contacts and Internet sites, both Haneda and Narita airports are open. While many flights to and from the United States have been canceled, some are proceeding (e.g., the Hawaiian Airlines flight from Honolulu to Haneda). It appears train service to and from the airports (but especially to Narita) is erratic. Concern regarding the situation at Fukushima Number One and Number Two Nuclear Power Stations overshadows that regarding other consequences of the earthquake and tsunami. The operator for the United/Continental flight to Sendai from Guam, the only U.S. airline serving Sendai, plans to reroute the flight to Narita, according to a Tokyo-based United Airlines source.

2145 Reuters report on Fukushima:

TOKYO (Reuters) - Tokyo Electric Power Co plans to fill a leaking reactor at the Fukushima Daiichi power plant with sea water to cool it down and reduce pressure in the unit, Japan's top government spokesman said on Saturday.

"The nuclear reactor is surrounded by a steel reactor container, which is then surrounded by a concrete building," Chief Cabinet Secretary Yukio Edano said.

"The concrete building collapsed. We found out that the reactor container inside didn't explode."

Japan earlier in the day warned of a meltdown at the reactor at the plant, damaged when a massive earthquake and tsunami struck the northeast coast, but said the risk of radiation contamination was small.

"We've confirmed that the reactor container was not damaged. The explosion didn't occur inside the reactor container. As such there was no large amount of radiation leakage outside," he said.

"At this point, there has been no major change to the level of radiation leakage outside (from before and after the explosion), so we'd like everyone to respond calmly," Edano said.

"We've decided to fill the reactor container with sea water. Trade minister Kaieda has instructed us to do so. By doing this, we will use boric acid to prevent criticality."

Edano said it would take about five to 10 hours to fill the reactor core with sea water and around 10 days to complete the process.

Edano said due to the falling level of cooling water, hydrogen was generated and that leaked to the space between the building and the container and the explosion happened when the hydrogen mixed with oxygen there.

2140 Youtube now carries the 8:40 p.m. press conference by CCS Edano:  
<http://www.youtube.com/watch?v=qd0bvBhZvKo>

2119 SITREP #1 (TOKYO 766) Sent. Attached separately

2118 Japan Self Defense Force Update in Hokkaido/Tohoku:

ConGen Sapporo contact at Japan Marine Self Defense Force liaison office in Northern Army Headquarters told me this evening about current movements of JSDF in Hokkaido. JGSDF 2<sup>nd</sup> Division (based in Asahikawa, Hokkaido) is sending their rescue teams to Iwate Prefecture three times from Mar. 12 (today) to Mar. 14. The teams will be sent through private-sector ferry from the port of Otaru. He normal destination of the ferry is Niigata, but JSDF requested to stop at Akita. The JGSDF 2<sup>nd</sup> Division's rescue teams will head towards JGSDF base in Iwate via road.

According to local media reports, JGSDF 7<sup>th</sup> Division (based in Chitose), 5<sup>th</sup> Brigade (in Obihiro) and 11<sup>th</sup> Brigade (in Sapporo) are now preparing to send rescue teams. Teams will be dispatched as needed.

2105, March 12, 2011, Saturday

2050 Key points from Press Statements of Prime Minister Kan Press C and Chief Cabinet Secretary Edano (very preliminary transcription of gist – not proofread for technical accuracy).

PM Kan highlighted the government's emphasis on rescue, noting he has asked Defense Minister to mobilize the Self-Defense Forces, for example. He appreciates POTUS and other offers of support. PM Kan did not get into substantive detail on the nuclear issue.

CCS Edano noted the explosion at Fukushima Number One Nuclear Power Station destroyed the structure outside of the reactor, not the reactor core. He attributed the explosion to oxygen outside the reactor structure. He also said that radiation levels outside were no higher after the explosion than before it. He noted authorities are attempting to cool the reactor core using chemicals and seawater.

2020 News channels report the downgrade in tsunami warning from "major" tsunami warning (Otsunami keiho) to regular tsunami warning (tsunami keiho).

2019 Iwate Prefecture conditions update:

CONGEN SAPPORO reached by cell phone a teacher in Ichinoseki, who reports her high school was damaged in the quake but there were no injuries. All services – electricity, water, gas – are non-operational everywhere in the town. There are long lines for food and water. She went by car today from Ichinoseki to Morioka, where her family lives. Her parents there lost electricity service, but not water or gas. Electricity has been restored just this evening to her parents' house, but is still out in most of the town. Morioka overall is in much better shape than Ichinoseki, but the train station is closed completely.

2018 Asahi News reports that TEPCO informed Fukushima Prefecture that its 10 posts to monitor radiation (location unspecified) are down. Fukushima Prefecture has its own monitoring posts and is collecting information using its own posts.

1930 Ambassador's Press Conference (statement delivered to press at auditorium, no Q/A)

**Ambassador John V. Roos  
Statement to the Media  
U.S. Embassy  
March 12, 2011  
Tokyo, Japan**

Good evening, everybody and thank you so much for being here tonight. Before I begin, I would just like to ask everyone to observe a moment of silence for the victims of this terrible tragedy.

This evening I am joined by some of the key members of my team: Lieutenant General Burt Field, Commander, U.S. Forces Japan; Captain Justin Cooper, our Defense Attaché here at the Embassy; John Beed, USAID Counselor; and, Consul General Paul Fitzgerald.

It goes without saying that we feel great sorrow, and our hearts go out to the people of Japan and to all of those who have been affected by the events of the last few days. Japan is our close ally and partner. President Obama spoke with Prime Minister Kan soon after the earthquake. On behalf of the American people, he conveyed our deepest condolences, especially to the victims and their families, and offered our Japanese friends whatever assistance is needed. I have been in constant contact with our government in Washington and the government here in Japan, including during this evolving situation with the Fukushima nuclear power plant. The United States is absolutely committed to helping Japan in any way possible to respond to and recover from the tragedy of the past few days and as Japan continues to deal with its effects.

Let me provide you with some information with regard to the current efforts of the United States.

First, let me take a moment to address American citizens here in Japan with regard to which we attach the highest priority. At this point, we have received no confirmed reports -- thank God -- of U.S. citizens killed or seriously injured. Our Embassy and our five consulates in Japan are working to obtain information on the status of all United States citizens and to provide assistance as necessary.

We know that many people are worried about the welfare of their friends and families who are here in Japan. We understand also that some telephone landlines have been interrupted. Of course, we are recommending that people continue to contact loved ones here in Japan by email, text, SMS message, or social media.

The State Department also has established a consular Task Force that will be responding to concerns about specific U.S. citizens in Japan. People may email the taskforce at [japanemergencyusc@state.gov](mailto:japanemergencyusc@state.gov). And I'll repeat that, [japanemergencyusc@state.gov](mailto:japanemergencyusc@state.gov).

Our consular officers in the Embassy and consulates have been responding around the clock to inquiries. This is something that they are trained to do very well, and all American citizens should feel free to utilize their services. They are also reaching out to the American citizen community, trying to push out information about what to do and what the Japanese authorities are also making available.

For additional information for American citizens in Japan, please check the State Department website ([www.travel.state.gov](http://www.travel.state.gov)). For information on the advisability of travel to Japan at this time, please continue to check the same website. The Embassy has also distributed to registered American citizens warden messages updating them on current conditions as we're able to obtain current information. The same information is being posted at our website. I am personally getting as much information out as possible on my Twitter account.

We urge American citizens in Japan to follow the instructions of Japanese civil defense authorities.

I'd like to talk a little bit now about the military assistance we are providing.

In response to Japanese government requests for assistance, U.S. military forces are mobilizing to conduct humanitarian assistance and disaster relief efforts throughout Japan. The Japan Self-Defense Forces are among the most prepared and capable in the world in dealing with a disaster response situation, and the U.S. military is prepared to augment their efforts with all available assets and equipment upon request.

Because of the longstanding and close working relationship between the U.S. military and its Japanese counterparts on a daily basis, the United States military has humanitarian assistance capabilities positioned in the affected regions that are ready to support emergency relief efforts and minimize human suffering.

U.S. military assets include a wide range of equipment, air, sea, and ground capability and expertise. Initial actions which have been undertaken by the U.S. military include the following:

Yokota Air Base was instrumental in recovering airline traffic in the hours immediately following the earthquake.

We immediately moved U.S. Air Force and Marine helicopter and transport aircraft from Okinawa to our U.S. military bases on Honshu.

The USS Ronald Reagan was heading east and was immediately turned around to support our efforts here in Japan. They arrive tonight.

We are moving Marine command and control units ready to work with Japan's Self-Defense Forces to coordinate our efforts on the ground.

We have units from all of our services, with a multitude of capabilities, from medical to communications to civil engineering poised and ready to support where needed.

The bottom line: our military is working closely with their Japanese counterparts to support where requested and needed.

The U.S. military's response, though, is part of a broader U.S. government support to Japan's request for humanitarian assistance. This effort includes coordination by the U.S. Department of State and the U.S. Agency for International Development, in constant consultation with Japanese authorities and the U.S. Pacific Command.

USAID immediately deployed a Disaster Assistance Response Team to Japan to respond to the humanitarian crisis in collaboration with the Government of Japan. In addition, USAID activated a Washington, D.C.-based Response Management Team to support the USAID/Disaster Assistance Response Team and coordinate the U.S. government humanitarian response. In accordance with a request from the Government of Japan, USAID mobilized and deployed two maximum level Urban Search and Rescue teams numbering more than 150 personnel. The teams have highly advanced capacities for providing hazardous material detection, emergency medical care, and water rescue assistance.

Finally, with regard to the Fukushima nuclear power plant specifically, our nuclear experts are directly in touch with Japanese experts, and we are offering our full assistance, in addition to our military and other assistance I just described, in any way we can with this ongoing situation.

The situation here in Japan is obviously still very fluid, and we are closely monitoring developments. We will of course update you as we learn more about the various aspects of this situation. But I want to be absolutely clear: the United States of America will support our close friend, our partner, and our ally in any way we can in the difficult days, weeks, and months ahead.

Thank you very much.

###

20:10, March 12, 2011, Saturday

2008 NHK reports that a Hyper Rescue Team sent from Tokyo Fire Department decided not to go to Fukushima Number One Nuclear Power Station because an explosion has already occurred; their mission was to assist in cooling down the reactor at that station. The team is reportedly returning to Tokyo.

20:05 Toyota Corporation is suspending operations at all factories in Japan on Monday to check status of employees and their families, according to NHK news.

2000 GOJ and Fukushima Prefecture confirm area of evacuation for Fukushima Number Two Nuclear Power Station remains 10 km.

1950 GOJ and Fukushima Prefecture now ordering a night evacuation for all personnel in an area 20 KM radius around Fukushima Number One Nuclear Power Station, which photos show has no roof or walls (it is a skeleton only).

1950 Estimates of casualties: Newspaper Sankei Shimbun reported National Police Agency estimates of 621 dead; 645 missing.

According to earlier reports by the National Police Agency, the death toll as of 1700 was at 574 (12 prefectures in Tohoku and Kanto). Injured persons were at 1105. The police in Sendai have reported seeing 200 - 300 bodies from a distance but cannot get close enough to confirm or to retrieve the bodies. The number of victims by prefectures are as follows:

Hokkaido:1  
Aomori: 3  
Iwate: 232  
Miyagi: 157  
Fukushima: 144  
Yamagata: 1  
Tokyo: 4  
Ibaragi: 15  
Tochigi: 3  
Gunma: 1  
Chiba: 10  
Kanagawa: 3

Damages to buildings are still difficult to assess in heavily struck areas such as Miyagi, Iwate and Aomori. Fully destroyed homes are reported as follows:

Fukushima: 2413  
Ibaragi: 26  
Yamagata: 36

Damages to roads are reported to be 307 roads in Ibaragi and 162 roads in Chiba.

Evacuation areas are reported as follows:

Iwate: 120 locations, 24,200 evacuees  
Ibaragi: 420 locations, 58,300 evacuees  
Aomori: 240 locations, 18,700 evacuees  
Fukushima: 420 locations, 104,900 evacuees  
Tochigi: 150 locations, 9,500 evacuees  
Miyagi: The scope of evacuation status has not been achieved as of yet.

19:15, March 12, 2011, Saturday

1909 Fukushima Prefecture will expand areas of mandatory evacuation for both Fukushima Number One and Number Two Nuclear Power Stations from 10 km to 20 km, according NHK News.

1905 Translations of Edano and NISA Press conferences prepared by Tokyo PAS

**Chief Cabinet Secretary Edano**  
**5:45 p.m. live press conference**

We have been informed that there has been some sort of explosion not in the reactor but in one of the buildings of the Fukushima No.1 nuclear plant. GOJ officials, including Prime Minister Kan and METI Minister Kaieda, are making utmost efforts to grasp, analyze, and respond to the situation there. We are receiving accurate information about the level of the radiation leak, and we will release the latest information after 6:00 p.m.

The current level of radiation is within the level that is assumed to be leaked when taking actions to control the reactor including cooling it and reducing the pressure inside it.

We are making utmost efforts to obtain accurate information about the situation.

We have issued an order for the evacuation of people within a radius of 10km rather than 3km.

We urge the entire nation to conserve energy against a potential energy shortage caused by earthquake-related damages.

**The Nuclear and Industrial Safety Agency**

**6:00 p.m. live press conference**

We are trying to confirm a report from TEPCO that there was the sound of an explosion and white smoke from the vicinity of a nuclear reactor building of the Fukushima No.1 nuclear plant at around 3:36 p.m. We will decide on our specific actions in response to this situation. However, we don't yet have any detailed information.

Q: News broadcasts apparently show that the reactor building has almost collapsed. Could you elaborate on that?

A: We need to collect more information to decide on further action.

Q: Is there a possibility that the reactor itself is seriously damaged?

A: We need to collect accurate information about the damage.

1900 MEDIA CLIPS COMPILED BY TOKYO PAS

**Short takes from major dailies' evening editions (3/12/11)**

Top headlines are as follows:

Northeastern coast devastated. (Asahi)

More than 1,200 killed or missing. Miyagi, Iwate coasts devastated. (Yomiuri)

Over 1,500 killed or missing. Gigantic tsunami leaves catastrophic damage. (Mainichi)

Tsunami damage enormous. (Nikkei)

More than 1,000 killed or missing. Sanriku coast devastated. Radiation leaks at nuclear plant in Fukushima. (Tokyo Shimbun)

**U.S. to send 150-strong relief team**

ASAHI (Page 5) (Abridged)  
Eve., March 12, 2011

In the aftermath of yesterday's devastating earthquake that hit the eastern parts of Japan, a number of countries have expressed their condolences and are moving to extend a helping hand.

U.S. President Obama called Prime Minister Naoto Kan. In yesterday's press conference too, he said this tragedy is "heartbreaking" when asked about the eastern Japan earthquake. He said he was brought up in Hawaii and Japanese culture was close to his heart, and he stressed that the United States is ready to extend a helping hand to Japan.

The United States Agency for International Development (USAID) announced yesterday that it will send search and relief teams consisting of about 150 members, including firefighters.

### **U.S. dispatches naval ships with relief supplies onboard**

MAINICHI (Page 4) (Full)  
Eve., March 12, 2011

Kazuhiko Kusano, Yoso Furumoto

WASHINGTON—U.S. President Obama held a press conference yesterday at the White House, during which he said the massive earthquake off the coast of Japan's northeastern districts could become a catastrophic disaster. U.S. naval ships and relief teams are already on their way to the disaster-stricken areas. Obama said he called Prime Minister Naoto Kan and offered to carry out every possible measure to support Japan. Naval ships and relief teams are being already headed for the disaster-stricken areas, and the Obama administration is now ready to make all-out efforts with its military and civilian resources.

In the meantime, at the Japanese government's formal request, the U.S. military is making arrangements for a plan to implement humanitarian assistance activities with Japan. The U.S. military is expected to provide relief supplies and transport disaster-stricken people as its immediate mission.

According to the Pacific Fleet of the U.S. Navy, the USS Tortuga, a landing craft homeported at Sasebo, left port last night with heavy-lift helicopters onboard. The USS Blue Ridge, the 7th Fleet's flagship, now in Singapore, will also head for waters near the scene as soon as it is loaded with relief supplies.

### **U.S. in a hurry to make preparations for help**

NIKKEI (Page 2) (Abridged)  
Eve., March 12, 2011

Sachiko Deshimaru, Washington

In the aftermath of yesterday's massive earthquake that hit the eastern parts of Japan, the U.S. government is accelerating its preparations to extend assistance. The U.S. Department of Defense has revealed that the USS Ronald Reagan, a nuclear-powered aircraft carrier, is now heading for the east coast of Japan's mainland. U.S. President Obama held a press conference yesterday, during which he



said the earthquake could become a catastrophic disaster and that the tragedy is heartbreaking. "I believe Japan will recover for sure," he said.

### **Matsumoto, Clinton hold talks**

NIKKEI (Page 2) (Full)  
Eve., March 12, 2011

Foreign Minister Takeaki Matsumoto held talks with U.S. Secretary of State Clinton over the telephone this morning. The telephone conference was held at the suggestion of the U.S. government. Concerning the massive earthquake that hit Japan's eastern districts yesterday, Clinton told Matsumoto that the United States is ready to take every possible measure of support, and she offered to keep in touch. Matsumoto expressed his gratitude, saying, "Our alliance [partner's] help is encouraging." They also confirmed that Japan and the United States will work together to deepen their bilateral alliance. Later in the day, the Foreign Ministry announced that as of today at 8 am, a total of 50 countries and areas, including the United States, have offered to help.

(11031202imbs)

1845 Conflicting weather forecasts makes predicting wind direction from Fukushima difficult.

Japan's Meteorological Agency predicts that wind from Fukushima on Sunday morning local time will blow from the West to East (i.e., out to sea), which would be very good news; for Sunday afternoon, it predicts from South to North (i.e., toward Sendai and away from Tokyo). It predicts the same for Monday. However, the wind direction forecast according to Weather News (a Japanese company), the prediction is from Southwest to Northeast for Sunday morning and from West to East (i.e., from land to sea) for Sunday afternoon and from SW to NE for Monday morning.

1810 NHK News reports Radiation Emergency Medical Assistance Team arrived 5 km from the areas of Fukushima Number One, and that two hospitals are ready to accept patients.

18:10, March 12, 2011, Saturday

1810 NISA Press conference gist:

TEPCO notified NISA that there was the sound of an explosion with vertical shaking at 1536 near the nuclear reactor number one building and turbine building of Fukushima Number One Nuclear Power Station. They do not have any information on the cause of this explosion. They are now gathering information. No comment on radiation so far.

1800 Conditions in Iwate Prefecture reported from ConGen Sapporo

Iwate Assembly member and longtime post contact gave following report on conditions in Iwate Prefecture: Ichinoseki is fine with minor damage, no deaths. Morioka (inland) is suffering from lack of electricity and some other lifeline damage, but is also okay as compared to the coastal area, where the damage will be 3-4 times of what is being reported now. Judging from the fact that a bridge is destroyed, he thinks that the Tsunami has to have been far higher than 10 meters. He is only hoping that JET and other Americans as well as other foreign residents in the area managed to catch Tsunami

warning in time and evacuated. The local elections in prefectures on the Pacific side will be postponed by 2-3 months.

#### 1755 Conditions in Sendai reported from ConGen Sapporo

CONGEN Sapporo LES received information from a contact in Sendai 1715. Water and gas supply continues, and she had just observed one side of Sendai Station lighting up, but the rest of downtown Sendai is in blackout condition, which means no heat for those with electric heat. Grocery and convenience stores were open to long lines of customers this morning but are now closed. People are in the streets looking for food. Rumors are circulating about food distribution. Information is coming into the city via battery operated radio. Smart phones are working but regular cell phones are not; it's possible to place and receive calls from Tokyo and even internationally but calls within Sendai are not going through.

1750 Chief Cabinet Secretary Yukio Edano said at a press briefing at 1750 that there has been some kind of explosion at Fukushima Number One Nuclear Power Station, although it has not been confirmed whether it involved a nuclear reactor or not. The GOJ will release the latest numbers regarding radiation after 1800. As for Fukushima Number Two Power Station, the authorities have expanded the mandatory evacuation area from 3 km to 10 km, he said. Authorities are standing by with iodine to provide to local residents, he said.

#### 1748 Fukuoka Update for Kyushu/Yamaguchi

1. Kitakyushu-based Star Flier Airline has cancelled 14 flights due to the closure of the Haneda Airport runway(s). SDF Western Army has decided to dispatch 5000 SDF members as well as 800 vehicles to Tohoku. The SDF 4th Division has already dispatched a team to Tohoku to investigate the level of damage. SDF Western Air Defense Force also sent 110 personnel from Tsuiki Base as well as from Kasuga Base.
2. Kyushu Electric Power has dispatched three nuclear power plant employees to Fukushima Nuclear Power Plant based on the cooperation treaty. Also, it has started to supply 150,000 kw electricity to Tokyo Electric Power from 00:00am on March 12.
3. Due to the earthquake off Tohoku, ferry boats, high speed boats and some fishing boats were forced to wait for berth assignment in Oita and Kagoshima. Some of the passengers in poor health condition were transported from ships to land by Coast Guard vessel.
4. 24 medical teams (119 people) with rescue experience and skill from six Kyushu prefectures departed for Tohoku on March 12 in three SDF airplanes. Also, two units of rescue teams from Fukuoka City and Kitakyushu City have been dispatched to Tohoku. Fukuoka Prefectural Government has begun preparations for receiving casualties from the earthquake. A "Doctor Heli" designed for transportation of the injured has already left for Tohoku as well.
5. In Miyazaki, 41,600 households were directed to evacuate to avoid Tsunami. In Miyazaki, a 1.6m high Tsunami was observed at 03:33am on March 12. Oita Prefectural Government also issued an evacuation order to 90,000 households.

1747 TSA Representative Tokyo has conducted full reporting to Transportation Security Operations Center, Washington, DC over the last 36 hours. Current reports from Japan Civil Aviation Bureau indicate that Sendai International Airport is totally closed, with approximately 1000 personnel stranded. Domestic airports Hanamaki and Ibaraki have suspended service, but they are accepting arrivals.

Tokyo (Haneda) International Airport and Narita International Airport are fully operational, but are recovering from the backlog of flights and dealing with approximately 14,000 stranded passengers.

Commercial diversions to Yokota Air Base in the last 36 hours have reportedly been resolved with departures to final Japan destinations, but that information is not confirmed. TSAR Tokyo has requested DAO assistance in establishing liaison with Yokota Airfield Operations in order to evaluate commercial diversions and response in coordination with US Embassy ECON Transportation.

Railway service is still degraded, but recovering.

All Post personnel should contact TSAR Tokyo with any questions concerning transportation security related issues, or other related challenges.

1745, March 12, 2011, Saturday

Radiation detected: NHK TV reports that Fukushima Prefecture authorities have detected radiation on the grounds of Fukushima Number One Nuclear Power Station in the amount of 1015 microsievert. This is twice the level at which the government requires a power company to issue a notification to the government. It is a level that, in one hour, can expose a person (under normal circumstances) to the equivalent of the maximum amount of radiation advised for one year.

Asahi TV reported that TEPCO said that an explosion reported below occurred at a turbine building not a reactor itself at 3:30. Four TEPCO employees were injured. Tokyo Fire Department has dispatched a "hyper rescue team" to Fukushima per Ministry of Internal Affairs and Communication's (MIC) request. NISA will have a press confereee after consultation with Kantei. Time has not been decided.

1710, March 12, 2011, Saturday

NHK reported at 1700 sounds of explosion and smoke at Fukushima Number One nuclear power station. Injuries are also reported by TEPCO.

SITREP re Fukushima nuclear power facilities to this point follows:

0900 Media reported the Fukushima nuclear plant #1 had begun venting steam from reactor #1 to reduce the pressure within the vessel. The Nuclear and Industrial Safety Agency (NISA) said the release of the low-level radioactive steam into the air did not pose a health risk to residents outside of the 10-kilometer evacuation area.

1200 Ambassador set up a call between DOE Deputy Secretary Poneman and Japan Atomic Energy Commission Chairman Shunsuke Kondo. DepSec Poneman provided the following readout:

(b)(5)

(b)(5)

\* Chairman Kondo's full sitrep is at the bottom of this report.

1300 The Nuclear and Industrial Safety Agency (NISA) reported Cesium was detected near Fukushima Power Plant #1 and there is a possibility of a meltdown. Media began to carry reports to this effect.

1500 Ministry of Foreign Affairs (MOFA)'s Tamaura said MOFA got an official request from Nuclear and Industrial Safety Agency for assistance from USFJ to transfer cooling water to the Fukushima Plant.

1510 NHK reported the operation at Fukushima No.1 plant to lower pressure of the containment vessel was suspended due to high radiation levels were too high at one of the vales to open it. The operation was suspended because of the possibility that workers could be exposed to radiation.

1528 Media reported cesium has been detected around Unit #1, indicating a meltdown may have begun.

1535 USFJ, DOE, Pol-Mil, Econ, and Front Office held a conference call on the current situation at the Fukushima facilities and the GOJ request for assistance. The request came from NISA and was conveyed through MOFA. The GOJ requested large amounts of water to be delivered to the Fukushima nuclear power plant to help cool the reactors. Initial word is that USFJ does not have this capability, though CNFJ is working to see if any appropriate resources are available. Tom Murphy reported the NRC has just dispatched reactor safety expert Tony Ulises from Dulles Airport and Jim Trapp (sp?) a BWR inspector is to depart in approximately seven hours. Both will arrive at Narita Airport and have helicopter transportation arranged to fly them directly to

Fukushima. A 10-person NRC/DOE team is supposed to depart the United States within 24 hours.

1700

NHK and other news sources report sounds of explosions and smoke at Fukushima Number One.

1620, March 12, 2011, Saturday

The government's Nuclear and Industrial Safety Agency says 2 radioactive substances, cesium and radioactive iodine, have been detected near the Number One reactor at the Fukushima Number One nuclear power station.

The agency says this indicates that some of the metal containers of uranium fuel may have started melting.

The substances are produced by fuel fission.

University of Tokyo Professor Naoto Sekimura says only a small part of the fuel may have melted and leaked outside.

He called on residents near the power station to stay calm, saying that most of the fuel remains inside the reactor, which has stopped operation and is being cooled.

Source: NHK

1550, March 12, 2011, Saturday

Update from Consulate Fukuoka:

Fukuoka Duty officer received no/no calls overnight or during the day today.

JMA reports Miyazaki harbor in southern Kyushu recorded a tsunami of 1.6 meter at 0333 12MAR. This was the largest tsunami recorded in Kyushu since the earthquake yesterday; local news has not reported any damage or casualties there or anywhere else in our district. The 43-story Sheraton Grande Ocean Resort hotel in Miyazaki near the harbor evacuated the basement and first floor in response to the tsunami warning, but confirmed to Duty Officer they had no damage and are now back to regular operations.

Hakata harbor (approx 2 km from the Consulate) recorded a 30 cm tsunami at 0212 12MAR.

JMA website maps indicate that as of 1350 12MAR, tsunami warnings/cautions were no longer in effect for Fukuoka and Saga prefectures and all Honshu prefectures facing the sea of Japan, but remain in effect for all other seafronts in Kyushu.

The Western Army has now started to deploy part of 16,391 troops that are approved for deployment from Kyushu/Okinawa (of these, about 1,563 are from Okinawa) to the affected region. This includes the bulk of the WA's 4th and 8th Divisions along with some elements of its 5th Engineer Brigade and emergency medical teams from JGSDF med units in Fukuoka and Kumamoto. WA is scheduled to have a

meeting at 1600 and its US Army Liaison officer will connect with Zama at 1700 to further US-Japan coordination.

As has been reported elsewhere, the only damage suffered by the US military so far has been some structural damage at Misawa.

Source: Consulate Fukuoka

1545, March 12, 2011, Saturday

Radiation levels at Fukushima No. 1 are 70-times the normal level at the facility's main gate and 1000-times the normal level in the main control room. The article does not attribute this information to any official source.

Source: Sankei

Update from Consulate Sapporo:

We have tried to contact many people and organizations in several prefectures in Tohoku through cell phone, land lines, and email, but so far our only contact has been one SMS at 2230 last night from a journalist in Morioka who said he was involved in trying to confirm the whereabouts and safety of his fellow newspaper employees. That has been our only contact with anyone in the region and successive attempts to reach that journalist have been unsuccessful. There are no flights operating from Sapporo Chitose airport to any airport in Tohoku. The train station in Hakodate is not operational, so train travel between Sapporo and Hakodate is not possible. Iwate Prefecture's website is down and they sent out notices on facebook and twitter stating this, but the only updates since then are a single tweet saying a certain railway will still not be operational through tomorrow, March 13.

Source: Consulate Sapporo

1524, March 12, 2011, Saturday

Delta Airlines has informed us that the Narita control tower went out of commission as of 12:07 today - no further information or confirmation available at this time.

Source: Tokyo CONS

1520, March 12, 2011, Saturday

Pacific coast of Hokkaido has been downgraded from "large tsunami warning" to "tsunami warning." The northeast coast of Honshu (Pacific coast of Aomori, Iwate, Miyagi and Fukushima Prefectures remain under a "large tsunami warning."

Source: NHK

1510, March 12, 2011, Saturday

The operation at Fukushima No.1 plant to lower pressure of the containment vessel has been suspended due to high radiation levels at the site.

Pressure of the reactor container is rising as its cooling system became dysfunctional due to a blackout and power generator breakdown. This has raised concern about possible damage to the container.

The power station's operator, Tokyo Electric Power Company, began to vent air from the reactor container at 9AM on Saturday.

Under the plan, 2 valves close to the container would be opened manually, but radiation level on the second valve was found higher than expected.

The operation has been suspended because of the possibility that workers could be exposed to radiation. The utility is reportedly studying how to open the valve by replacing workers at a short interval, or using electric remote control.

The Nuclear and Industrial Safety Agency says if radioactive substance is released in the air, safety of residents evacuated beyond a 10-kilometer radius from the No.1 reactor will be ensured.

Source: NHK World

1500, March 12, 2011, Saturday

Cesium was detected near Fukushima Power Plant #1 and there is a possibility of a meltdown, according to the Nuclear and Industrial Safety Agency (NISA)

Source: Jijitsushin

1450, March 12, 2011, Saturday

Damage from the earthquake has caused water supply stoppages to 1.1 million homes in 18 prefectures from Hokkaido to Chubu.

Source: NHK

1408, March 12, 2011, Saturday

The Tokyo Electric Power Company (Tepco) is warning of blackouts and urges customers to limit use of electricity, especially during peak evening hours. Peak usage from 6 pm to 7 pm is expected to reach 38 million kilowatts but Tepco can only supply 37 million kilowatts.

Source: Kyodo

Update on casualties and missing:

430 people have been confirmed dead and at least 200 others are believed to be dead.

On top of that, more than 740 people are missing in several prefectures in the country's northeast.

Source: NHK

1340, March 12, 2011, Saturday

New Zealand is intending to send a Search and Rescue team as the Japanese authorities have requested. At this point no consideration has been given to other forms of assistance.

Source: Embassy of New Zealand in Tokyo

1335, March 12, 2011, Saturday

The Nagano Shinkansen Line, which went down following the early morning aftershock, will be up and running as of 4 pm this afternoon.

Source: FNN

1223, March 12, 2011, Saturday

Update from Misawa AB as of 11 am

- No news from us on the nuclear plant one way or another
- We are still without commercial power across the area (generator power at key facilities on base). We are also without heat where we don't have power. No known way ahead on power.
- Have not hear base use as evac center, but we are looking at out potential capabilities.
- Have heard talk of use of base as aerial port for respupply.
- No good comms yet with Misawa City Mayor, but they are in about the same situation
- East coast near Hachinohe has water damage, but don't know how much yet.
- No casualties to AMCITs that we are aware of yet from our base. We're still tracking down a few last dependents
- We've offered potable water to the city since word is theirs is bad, but they said they have enough for now.
- Otherwise we are still busy trying to recover our own base and just starting to think about external logistic support.
- Airfield is operational.

1143, March 12, 2011, Saturday

The National Police Agency has released information on damage to major infrastructure in the affected regions. Serious damage has been reported on roadways at 422 locations, 22 bridges are damaged, and five levees have been severely damaged.

Source: NHK

1118, March 12, 2011, Saturday



Osaka kobe update- Expanded EAC meeting this am. No confirmed deaths of amcits in our consular district, minor if any damage reported. According to local news reports, several small (less than 1 meter) tsunamis have come ashore. Airports are open for arrivals and departures and trains functioning normally and on schedule. Initial assessment is that there is no damage to consulate building or housing compound. Consulate will open for normal business Mon am. All official Amcits are accounted for, are safe and have been contacted.

Source: Consulate Osaka Kobe

Naha reports that a tsunami warning remains in effect for Okinawa. According to JMA, highest observations for our district for second waves that hit between 0148 and 0700 was Amami shi Kominato at 1.2 meters. However the main island and Ishigaki reported only .2-.6 meters. No media reports of damage on Amami shi Kominato. No calls have been received overnight or Saturday morning on the FSN or officer duty phone. With Tokyo's help we have been able to successfully change our phone message notifying callers of the duty phone number for emergencies.

Source: Consulate Naha

1106, March 12, 2011, Saturday

The new Hakata-Kagoshima Shinkansen line has opened on schedule today despite the earthquake but all celebrations and events related to the opening have been cancelled.

Source: Consulate Fukuoka

1052, March 12, 2011, Saturday

Update on casualties and missing:

256 people have been confirmed dead and at least 200 others are believed to be dead.

On top of that, more than 740 people are missing in several prefectures in the country's northeast.

Source: NHK

1041, March 12, 2011, Saturday

The cooling system failed at three reactors at Fukushima No. 2 nuclear power plant, according to Tokyo Electric Power Co. This is in addition to radiation leaks reported at the Fukushima No. 1 plant.

The company notified the government that failsafe system at the No. 2 plant stopped functioning as the temperature of the coolant water topped 100 degrees Celsius.

Source: Kyodo

1035, March 12, 2011, Saturday

As of 11 am Tokyo time, the Embassy Tokyo Consular Crisis Center will return to the Consular Section in the Chancery building.

0925, March 12, 2011, Saturday

Instructions have been given to evacuate those who are in and around the Fukushima #2 nuclear plant.

0921, March 12, 2011, Saturday

The Japan Meteorological Agency has extended their tsunami warning. Tsunamis higher than 1 meter to 3 meters have been observed.

Source: NHK World website

Update regarding nuclear reactor in Fukushima:

The area 3km evacuation area has been expanded to a 10km radius.

Source: NHK World website

A 1.5 meter tsunami at Toba City, Mie Prefecture and a 1.0 tsunami at the Port of Nagoya was reported by the principal officer from Consulate Nagoya.

0854, March 12, 2011, Saturday

Update regarding nuclear reactor in Fukushima:

The Tokyo Electric Company has wanted the Japanese government of an emergency situation at a second nuclear plant in quake stricken Fukushima Prefecture. This warning follows the one earlier in the day for Plant number 1. The Government's Nuclear and Industrial Safety Agency said that equipment failures have made it impossible to cool three of the plant's four reactors. It said the situation poses no immediate threat of radioactive leakage. The agency is considering whether it needs to issue an evacuation advisory to people living near the plant.

Source: NHK World website

0844, March 12, 2011, Saturday

Update on the nuclear reactor in Fukushima:

According to the Nuclear and Industrial Safety agency, announced an "emergency status" for nuclear plant number 2 (in addition to the previous emergency status announced earlier for nuclear plant number 1). There is no immediate radiation leak. They are in the process of determining if evacuation is necessary. Source: NHK website

0838, March 12, 2011, Saturday

Update regarding dead and missing in quake:

The dead and missing in the quake Japan-wide is estimated at more than 1000. 185 confirmed dead.

Source: Kyodo News

Update regarding travel of the Prime Minister:

Prime Minister Naoto Kan left Tokyo by helicopter Saturday morning for northeastern Japan to inspect the disaster area. Source: Kyodo News

0830, March 12, 2011, Saturday

Update regarding status of Narita Airport:

According to the Narita Airport Authority is providing the following advice:

- 1) Passengers need to stay in the terminals that have been confirmed to be safe
- 2) Regarding flights, please contact airlines directly
- 3) Please remain calm and listen to airport staff carefully.
- 4) If you have any questions or concerns please do not hesitate to contact staff for assistance.

Source: Narita Airport Authority website.

0816, March 12, 2011, Saturday

Update regarding nuclear reactor in Fukushima:

According to Heather Dresser (EAP/P), a backup generator (truck) is being brought to the plant. Once it arrives, staff can do "a release and restart of the cooling system (which was not damaged). It just cannot currently function without power." Source Ms. Hiyakawa of the Japanese Embassy in Washington.

0807, March 12, 2011, Saturday

Update regarding transportation to Narita Airport

Twitter chatter about Narita Airport in past half hour indicates that some trains are running to Shinagawa and that Qantas has advised Australian travel companies that Narita will reopen today.

0751, March 12, 2011, Saturday

Update regarding dead and missing in quake:

The dead and missing in the quake Japan-wide is estimated at more than 1000. In Sendai Prefecture 200 to 300 dead were confirmed along the coastline. Source: Nikkei.com

0733, March 12, 2011, Saturday

Update regarding Fukushima Nuclear Power Reactor Number 1:

According to the Nuclear Safety Agency, the measured radioactivity at the front gate was more than 8 times normal. The level of radioactivity measured at the central control room which is located closer to the nuclear reactor was measured at more than 1000 times normal. Source: Nihon TV News.

0711, March 12, 2011, Saturday

Update regarding unaccounted for Americans:

ConOff spoke with Cameron Peek by phone. Peek is AmCit working in Miyagi Prefectural Office. He said there is no change on the status of the unaccounted for eight AmCit U.S. teachers.

Just after 0600, Peek sent an email to all JET English teachers in the prefecture and included the names of the unaccounted for Americans, asking for any information on their whereabouts.

At 1200, Peek will go off shift. He will be replaced by Luke Haple, a British citizen. Haple's email is [cir2@pref.miyagi.jp](mailto:cir2@pref.miyagi.jp). Peek's email is [cir1@pref.miyagi.jp](mailto:cir1@pref.miyagi.jp).

0648 hours, March 12, 2011, Saturday

Prime Minister Kan (reports from Japanese news):

Has departed Tokyo; will travel by helicopter to inspect the power plant area.

Transportation:

Train service resuming about 0700.

Overhead freeways in Tokyo: traffic is moving.

0633 hours, March 12, 2011, Saturday

From Cody Walsh

Embassy Tokyo/Pol-Mil

All,

Please see updates below as of 0615 local time.

1) Search and Rescue team

- a. OFDA requirements (CIQ, transport, fuel, water, etc.) for in-country HA/DR activities were passed on to USFJ and the GOJ . See attached.
- b. The GOJ can meet CIQ requirements, but cannot promise to fulfill other requirements
- c. MOFA confirmed that the GOJ will officially accept the USG's offer to provide assistance and will welcome the search and rescue teams to the affected areas provided that USFJ is able to fulfill other requirements (i.e. transport, fuel, water, etc.)
- d. USFJ is working with PACOM and other appropriate bodies to evaluate capacity to support the remaining requirements

Rescue Dogs

- e. Embassy Tokyo asked the GOJ on possibilities for lifting quarantine requirements for the rescue dogs. OFDA's LA team is requesting this information before they commit to bringing the dogs.
- f. The GOJ is requiring paperwork and provided forms for the "special quarantine requirements for rescue dogs" to be completed
- g. The paperwork has been passed on to OFDA to complete and return via Embassy Tokyo's USAID representative

2) Usage of USAF Bases

- a. No updates since USFJ's response below

3) USS Ronald Regan

- a. No updates since USFJ's response below

4) USN Transport Support

- a. No updates since USFJ's response below

0623, March 12, 2011, Saturday

Update: Nuclear Power Plant Fukushima

Source: NHK Japanese Public News

Government of Japan is still planning to release vapor from reactor #1. However, this requires electricity. Because the electricity is not available, the government cannot complete the release. Pressure is now 100x normal.

0526, March 12, 2011, Saturday

Fukushima nuclear plant update:

(Source: Yahoo, re-reporting from Japanese newspaper Sankei Shimbun): At 0300, Minister of Economy and Industry Kaeda held a press conference and said Tokyo Electric has decided to release a "small" amount of vapor from reactor #1 due to above average pressure. As the wind is blowing oceanward, not expected to have any effect on citizens. Prime Minister Kan is expected to visit Saturday morning to inspect. Reactor #2 showed no abnormalities, but may change.

0457, March 12, 2011, Saturday

Two American Airlines flights (AA 61 and AA 169) diverted to Sapporo/Chitose with approximately 220 passengers each reported to have been deplaning at 0300 hours. A few minutes ago, confirmation of deplanement came through. The passengers on the planes had been reported to have been held for six hours before that due to lack of customs/immigration clearance, though hotel rooms had been secured for all crew. (Source: internal email chain)

0435 hours, March 12, 2011, Saturday

Additional details on nuclear plant in Fukushima from short news article from NHK, Japanese public news, relayed at request of DOE A/S:

It is at plant #1

They also have plants #2 and #3, about which they will decide later.

Pressure: 1.5 times the average

600 kilopascal

Residents who are between 3-10 km away, if sheltered, should be safe.

The company, Tokyo Denryoku, says the situation of the residents is secured, because they are sheltered.

From Lynda Hinds, Front Office:

As discussed during the Japan Earthquake Task Force Interagency Conference Call this morning, the GOJ has officially made four requests for assistance:

- 1) Recue teams and rescue dogs
  - a. Embassy Tokyo has communicated to the GOJ that we have two search and rescue "heavy" teams with water rescue capability from OFDA (LA and Fairfax teams) totaling 200 people.
  - b. A flight has been chartered from Phoenix to transport the teams to Japan. We are still waiting for information on a specific ETA.
  - c. We are still waiting for the GOJ to respond on requirements including location for dispatch, required capabilities, number of units the GOJ can handle, and equipment needs
  - d. Ministry of Foreign Affairs (MOFA) is following up on GOJ requirements with the Chief Cabinet Secretary's office
- 2) Usage of U.S. Air Force bases

- a. The GOJ requested the use of two air bases (Misawa and Yokota) as collection and distribution ports for receiving foreign (3rd country) assistance
  - b. USFJ has provided the GOJ with authorization to use both Misawa and Yokota Air Bases
  - c. The GOJ will be using Misawa AB as the primary site for collection and distribution given its proximity to the affected areas
  - d. Yokota AB and two Japanese civilian airports (Fukushima and Hanamaki airports) will be used to support if additional capacity is needed
  - e. The GOJ's ASDF air bases in Hachinohe and Matsushima are heavily damaged and inoperable
  - f. The foreign countries that will likely be using Misawa and Yokota will be Australia, New Zealand and the ROK
- 3) GOJ helicopter landing authorization, medical assistance and refueling on CVN 76 (USS Ronald Regan)
- a. The GOJ's requests landing/lift-off authorization for helicopters belonging to the JSDF, Fire and Disaster Management Agency, National Police Agency, and Japan Coast Guard on the U.S. aircraft carrier Ronald Regan, which is en route to the disaster area off the coast of Miyagi
  - b. In addition, FDMA requests assistance for refueling of the helos and medical support for injured civilians on the CVN 76
  - c. The GOJ is still confirming the specific type of helicopters in question, number of helos, and estimates of fueling needs
  - d. As soon as the CVN 76 arrives, the Japanese side would like to start the helicopter operations on the CVN 76
  - e. JSDF would like to be in charge of coordinating the helicopter operation involving helicopters from JSDF, Police agency, Fire and Disaster Management Agency and Japan Coast Guard
  - f. The GOJ understands that between the JSDF and USFJ, there is the ACSA so believe that there will be no fees involved for refueling for JDSF helos
  - g. The GOJ would like to confirm if there will be any fees involved for refueling helicopters belonging to Police Agency, Fire and Disaster Management Agency and Japan Coast Guard
- 4) USN vessel support for transportation of JGSDF forces
- a. The GOJ (JDSF) requested a U.S. Navy vessel to transport approximately 700 troops from Otaru to Akita for relief efforts
  - b. The GOJ has found a ferry from a private company that would be able to transport them at 1900 local tomorrow evening (12 MAR), but would like to leave before then, if possible.
  - c. The GOJ is yet to provide additional details regarding specific locations for their transport requirements

0407 hours, March 12, 2011, Saturday

Nuclear plant update Fukushima:

Japanese news reports will let out some air to release pressure, which will also let out some radiation—says small amount. They will announce beforehand time of release.

New quake: magnitude 6 reported in Nagano prefecture by Japanese news.

0333 hours, March 12, 2011, Saturday

Contact regarding efforts to locate Miyagi U.S. citizen English teachers:

ConOff in Tokyo spoke by phone with AmCit (?) Cameron Peek, working at the Miyagi Prefectural Office on overnight shift, by phone. Peek gave details on his attempts to contact the unaccounted for AmCits: Three, BREUN, OI, and FALES, are in the Kesenuma/Motoyoshi area, where there is a high likelihood of tsunamis; it is also an area where many fires have been reported. This area has been recommended for evacuation—it is very unlikely they would be at their homes. Two, ANDERSON and EMERSON, were in a coastal area. One, MOLNAR, was in Sendai City, semi-coastal.

The earthquake occurred at about the time teachers would have been heading home for the day. Hence, it is possible they would have been prevented from going home by their teachers.

Peek intends to ask teachers who have/have already been contacted to look for unaccounted-for teachers after sunrise.

Fukushima nuclear plant update:

Japanese news reports that internally the pressure level is higher, therefore the risk of radiation level is higher, and authorities are debating releasing air outside to relieve pressure, which would release radiation.

0227 hours, March 12, 2011, Saturday

1800 houses reported destroyed in the town of Minami-Soma in Miyagi Prefecture. Due to this, total deaths is now expected to go over 1000. (MSN)

Gas plant explosion reported by MSN in Miyagi Prefecture, town of Takajo. Still on fire.

0215 hours, March 12, 2011, Saturday

Nuclear plant in Fukushima latest from Nikkei news:

Pressure is exceeding normal standards—therefore, radiation leak may still occur. Residents within three kilometers are asked to go to a shelter. The cooling system water level is going down. However, the U.S. is supporting; Secretary Clinton called and said U.S. airborne has brought cooling materials to the plant.

Update to numbers of AmCits in four main affected prefectures, now including Fukushima prefecture:

Aomori 420

Iwate 183

Miyagi 207

Miyagi-Sendai 483

Fukushima (Tokyo consular district) 64

Total: 1357

0154 hours, March 12, 2011, Saturday

Tokyo DCM/CG agree we wish to clarify registered AmCit numbers for northern Japan. While Consulate Sapporo estimated 4,300 for its entire district, the most affected prefectures, are Miyagi, Iwate, Fukushima, and Aomori. Registered Amcits in most highly affected prefectures:

Aomori 420  
Iwate 183  
Miyagi 207  
Miyagi-Sendai 483  
Fukushima (Tokyo consular district)  
Total:

**Nuclear plant in Fukushima:**

Tokyo Denryoku, the company running the plant, reports as of 2300 that no radiation leak has been confirmed. Two people have been injured.

Japanese news: Government announcement of emergency remains in place despite no leakage of radiation.

**Embassy children in Tokyo:**

0111 hours, all school buses reported arrived by CLO. CLO has a list and believes all children are accounted for.

**Obama/Kan:**

Japanese news reports President Obama and Prime Minister Kan spoke at 0015 local time and discussed how the U.S. will support Japan.

0134 hours, , March 12, 2011, Saturday

Transportation, subways: Japanese media reports that some subway lines (appears to be four of thirteen) are provisionally scheduled to run all night in order to help people get home (normally, they shut down after about 12:30 a.m.). However, fewer trains than normal have been running.

**AmCits in Miyagi Prefecture:**

Consul in Sapporo consulate reports he has heard from an AmCit contact for U.S. citizen teachers in Miyagi prefecture (most heavily affected prefecture. Consul writes, "bottom line - all but 8 AMCIT JETS [government of Japan sponsored English teachers] accounted for."

The actual message:

Consul General Ries, Consul Lyons,

Please refer to the attached excel document. We have made this list of the 71 JETs in Miyagi. As of 0:00 on Saturday the 12th, we have established contact with 60 people who have said they were safe. Of the remaining 11 whom we have not contacted, 8 are American.

We have established shifts for one of the two CIR Prefectural Advisors to be at the Prefectural Office at all times, and will continue these shifts until we establish contact with all 11 people.

I will re-update you before my shift ends at 12:00 pm tomorrow. If you would like earlier updates / updates at regular, please let me know. It is no trouble at all."

0116 hours, March 12, 2011, Saturday

Nikkei News reports latest casualty figures are 660 dead/missing, 627 injured.

MSN: 531 missing, 627 serious injuries in northern prefectures.



Numbers of AmCits in primary affected area in Northern Japan from American Citizen Services registry from Consul Tom Lyons in Sapporo:

Here are our warden numbers from CCD - I'd say add about 15% to each to account for unregistered folks.

Registrants without a Warden Zone 520

Hokkaido 905

Hokkaido-Sapporo 907

Aomori 420

Akita 220

Iwate 183

Miyagi 207

Miyagi-Sendai 483

Other (Traveler, etc.) 21

Short Term Registrant Zone (This Zone is assigned for Subjects who are Registering with the Post for Trips that are shorter than the number of days set by Post.) 175

Total registrants: 3771

Total registrants +15%: 4337

#### 0054 hours, March 12, 2011, Saturday

135 now official death report according to Japanese public news.

U.S. and Korea were doing joint training, and ship "Ronald Reagan" is heading to assist Japanese Self Defense Navy offshore of affected area to supply oil and assist in rescue (source: MSN)

A four car train in Miyagi prefecture cannot be contacted; believed washed off of the tracks and into the ocean by tsunami. (NHK Japanese public news)

#### 0037 hours, March 12, 2011, Saturday

From Consul in Sapporo: "I just received a call from Maj. Eric Nebeker, the USARJ Liaison to JGSDF Northern Army. Northern Army is requesting a U.S. Navy vessel to transport approximately 700 troops from Otaru to Akita for relief efforts. Preferably, they would like to show 'a U.S. ship with Japanese faces' to show the strength of the alliance during these times. They have found a ferry from a private company that would be able to transport them at 1900 local tomorrow evening, but would like to leave before then, if possible."

#### 0030 hours, March 12, 2011, Saturday

Government of Japan Minister of Defense has mobilized 8000 troops to dispatch—article not clear as to where they are being sent.

Cool-down procedures at Fukushima nuclear plant are not working; state of emergency official.

(NHK, Japanese public news)

#### 0025 hours, March 12, 2011, Saturday

From Sapporo, relaying information from Misawa AB Ops Center:

Commercial power that feeds the base is down, unknown time to restore. Critical infrastructure is working on generator power. There is minor damage to infrastructure but all buildings are good to go. No major injuries or deaths have been reported. We have 92% accountability of all our military and civilians. Our airfield is 100% functional but base support facilities are hampered by the power outage.

As for off-base, the entire area surrounding Misawa Air Base is without power. We have few reports from the local leadership but they have been very concerned about coastal areas and the tsunami. Water is not potable in the city water supply but they can boil for 20 min.

The biggest issue for both base and city will be heat. Outside air temp is 28 degrees Fahrenheit tonight. On base, we have centralized steam plants and the plants are good, our distribution system is hampered by the power outage but recoverable. In town, individual homes don't have that benefit so it's going to get cold quickly for them. Shelters are being set up in the schools as we understand it.

0018 hours, March 12, 2011

Residents within three kilometers of the nuclear power plant in Fukushima prefecture (northern Japan) have been told to evacuate (Yahoo News)

0009 hours – March 12

From Yahoo! Japan news:

300 drowned bodies reported found in Miyagi prefecture

400 houses no electricity in Tohoku (northern Japan)

Official reports total confirmed 98 deaths, 351 missing as of 2300 hours

Ministry of Foreign Affairs has officially asked the U.S. military for help: top official called Ambassador.

Also asked help from China, Russia, and 25 other countries.

0008 hours – March 12, Saturday

From Osaka consular officer:

Based on a duty calls from amcits claiming that airlines were not handling stranded passengers well, just giving them money and sending them away, and a contact at one of the airlines who said several planes from the US were being diverted to Kansai Int Airport with potentially hundreds of amcits we went out to the airport to see if there were any Americans with health or immigration issues and to see if it was as bad as we had heard.

What we saw was the opposite. KIX appeared orderly and we witness no ugly customer service incidents. The arrival and dep board showed only a few delays and cancellations. Most people were calm. Airline counters were appropriately staffed with some lines, but nothing to suggest confusion.

We spoke with two different airline's staff who both said that yes there had been some delays but that passengers were being rebooked and those that needed were being directed to hotels or being allowed to stay overnight in open vip lounges. We went to the lounges next. I counted about fifty people of mixed nationalities relaxing or sleeping. KIX did not appear busy by chicago ohare standards. In fact, definitely not comparable to a midwest snowstorm delay at all.

Customs and immigration officials said they had no issues with amcits.

(b)(5)

2240 hours – March 11

Miyagi prefecture police reported finding between 200 and 300 dead bodies. No further details.

2235 hours – March 11

Japanese news reports a fishing boat with 100 people onboard is lost at sea and presumed sunk.

Japanese news also reports that 48 people in Ofunato, Iwate prefecture, are missing.

2146 hours– March 11

Japan media reports 61 deaths:

|            |    |
|------------|----|
| Tokyo:     | 3  |
| Iwate:     | 26 |
| Miyagi:    | 8  |
| Fukushima: | 12 |
| Ibaraki:   | 5  |
| Tochigi:   | 1  |
| Chiba:     | 3  |
| Kanagawa:  | 2  |
| Unknown:   | 1  |

Japanese Customs Bureau told Emboff that Narita will fully open at 0600 local time Saturday.

2135 Tsunami warning from Japan Meteorological Agency includes major tsunami warning for most of the pacific coast of Honshu and Hokkaido islands.

2135 – March 11

Narita closed until at least 11pm (rumors are it will be longer). Some planes departing, but none arriving.

Narita airport reports that access roads into the airport are mostly closed. Public transportation to and from the airport is not operating. Blankets are being distributed to stranded passengers.

Haneda is up and running. Many U.S. planes diverted to Sapporo, Kansai (KIX), and Yokota AFB. Most of those flights are reportedly slowly making their way to Haneda. Roads to the airport are jammed, and public transportation to/from the airport is not running.

2113– March 11

Japanese news reporting current casualty totals:

Dead: 50

Missing: 39

Injured: 244+

2036– March 11

Japanese news reports 39 deaths.

General Affairs Ministry Fire Agency reported 97 fires in 9 prefectures, with 23 fires in Sendai City, near the epicenter.

Landslides have trapped an unknown number of people in Fukushima, and 12 people are reported missing.

#### 2016– March 11

JET English teachers in Japan have been requested to report their status to the main office in Tokyo by Monday (3/14) afternoon.

In Miyagi prefecture, there are 71 JET teachers, 45 of whom are confirmed safe. There are no reports of deaths or injuries.

#### 1951– March 11

Tokyo Reuters (via Yahoo)

Japanese nuclear power plants and oil refineries were shut down and a major steel plant was on fire.

Kyodo News

Sony closed 6 factories

Air force jets surveying the damage on Japan's northeast coast.

#### 1935– March 11

Japanese TV:

32 confirmed deaths

A new strong earthquake warning was put out for Tohoku (northern main island Honshu), Kanto (includes Tokyo, Niigata prefecture

Fire was put out at Miyagi prefecture nuclear plant.

Fukushima prefecture nuclear plant announced its safety.

Sendai city airport: numerous people are waiting to be rescued from the top of the building.

Japan Times/Kyodo News:

The government on Friday quickly sent the Self-Defense Forces to Miyagi Prefecture following a request from Gov. Yoshihiro Murai.

All ships docked at the Maritime Self Defense

Yokosuka base forces (U.S.?) were ordered to sail to waters off Miyagi, and after eight fighter jets took off from four bases of the Air Self-Defense Force (Japan) to check the quake damage.

The government of Japan set up a task force at the crisis management center of the Prime Minister's Office to control the situation.

#### 1919– March 11

28 confirmed dead.

Bullet train from Tokyo to Osaka now running.

Bus started running around 16:00—local buses, but not highway buses.

Tsunami in Tokyo: arrived, slightly over one meter.

(Tokyo TV news)

1901 hours– March 11

(Kaneshiro in Okinawa:) We've also been monitoring national press from Okinawa. In addition to the deaths you reported in Tokyo, our running count of additional confirmed deaths reported by NHK and TBS as of 1850 is:

Tochigi prefecture – 1 dead

Fukushima prefecture – 1 dead

Iwata prefecture – 10 dead

Chiba prefecture – 1 dead

Miyagi prefecture – 3 dead; 100 people trapped in a collapsed bldg in Ishinomaki

Ibaraki prefecture – 1 dead

Also, we noted:

Yokohama City – 10 people trapped in a collapsed building

Tokyo – 22 active fire sites

Iwate – 1 landslide

1900– March 11

Hawaii, Oregon, Washington, Washington, California, parts of Alaska: tsunami warning. Projected to hit at 800 hours eastern time first in Hawaii.

1858 – March 11

TV News reported:

Fire in the basement of the Onagawa Plant #1 of Miyagi as been reported. There is no nuclear leakage is detected yet. (Cubas)

1854 hours – March 11

FUKUOKA – 1854, March 11, 2011

METI reported at the safety meeting at 5:10 that emergency generators do not work in the reactor 1 and 2 of the Fukushima Nuke Plant #1. Nuclear reaction/activity automatically stopped by the quake. But disintegration heat has been leaking and generator for cooling it is necessary.

As of now METI reported the followings:

Stopped by quake or stopped for regular inspection:

(Miyagi) Tohoku Electric Power Onagawa Nuclear Plant #1~#6 reactors

(Fukushima) TEPCO Fukushima #1 Nuclear Plant #1~#3 reactors (#1 and #2 reactors have possible leakage.);

(Fukushima) TEPCO Fukushima #2 Nuclear Plant #1~#4 reactors

(Ibaraki) Japan Nuclear Power Tokai #2 Nuclear Plant

(Aomori) Tohoku Electric Power Higashi Doorri Nuclear Plant

(Shizuoka) Chubu Electric Power Hamaoka #3 Nuclear Plant  
(Niigata) TEPCO Kashiwazaki Kariwa Nuclear Plants #2~#4

Working:

Hamaoka #4, #5 reactors  
Kashiwazaki Kariwa #1, 5, 6, 7 reactors  
Hokkaido Electric Power #1, 2, 3 reactors  
Aomori Reprocessing Plant

NAHA – 1840, MARCH 11: Naha has accounted for our staff, including our FSN who is traveling in Tokyo. A very minor tsunami hit the Amami Islands (in our district) at 1810 and the main island of Okinawa shortly afterwards. OPG reports no damage. We also checked with the Amami city government (in our district) and they also report no damage. Tsunamis are still projected to hit southern Okinawan islands but estimates are that they will be minor. According to the police, Naha airport remains open and there is no plan to close the airport.

USFJ UPDATE ON MIL INSTALLATIONS AND PERSONNEL IN JAPAN AND REQUEST TO AFN BROADCAST OUR WARDEN MESSAGE: USFJ has also stood its command center and has been receiving reports from mil installations across Japan. As of 1835 they report:

-- no fatalities or casualties to SOFA personnel in Japan  
-- minor damage to only one installation (Misawa AB)

Also, we reached out to the Armed Forces' Network (AFN) in Okinawa and asked them to broadcast our warden message across Japan. Naha has also launched the Naha congen facebook page that waiting for clearance in order to get messaging out.

#### 1850 – March 11

26 deaths confirmed as of 1830  
Numerous missing and injured  
Iwate prefecture: supermarket collapse  
Cosmo Oil Refinery in Chiba prefecture  
Tokyo: 2 deaths, 45 injured  
New tsunami warning in the south: Fukuoka prefecture  
From Tokyo north, no more trains today, railway announced

#### 1849 hours – March 11

Nagoya Update:

Two small tsunamis (less than a foot) hit Nagoya at around 1645JST. No injuries or property damage. All staff and dependents are accounted for- including Tokyo/Pol Andrew Ou who is down here TDY.

Prefectural police in Aichi, Mie and Gifu report no/no Amcits affected by the earthquake. (Jonas Stewart)

1843 – March 11

Magnitude was 8.9 original quake

13 foot tsunami damaged buildings and washed away homes along the northeastern coast

No radiation leaks have been detected from Japan's nuclear power stations, Prime Minister Kan says.

Japanese gov't: tremendous damage

Tsunamis up to 10 meters high slammed coast, three reported killed

1841 – March 11

Background: SAPPORO: - record of times and contents of emails

1524: We just had another earthquake – looks to be in about the same location as the one Wednesday, but stronger. We felt this one in Sapporo, though it was just some mild rocking – compared with nothing during the Earthquake on Wednesday.

The big issue with this earthquake is the Tsunami – expected to be up to 10 meters. Unconfirmed reports that the runway at Sendai airport is cracked. No other damage/casualty estimates at this time.

We have attempted to call contacts in Sendai, but phones will not go through.

1550: On TV they are showing large tsunamis hitting in Kesenuma, northeast of Sendai. Looks pretty bad – cars and buildings washing away. Still no word from Sendai – phones still unable to get through.

1613: Magnitude of the earthquake has just been updated to 8.4. Local news just showed waves overcoming farmer's fields in Nattori, which is between Sendai and the coast. Sendai is the largest populated area in the most affected by the quake/tsunami.

Sendai is approximately 10 miles inland; however, Sendai's airport is between Nattori and the coast, meaning that it is likely underwater.

1621: We have reports of a tsunami of 3.5M on the southern tip of Hokkaido and flooding throughout Southern Hokkaido, but no reports of damage or casualties; They have updated the tsunami warning to "Major Tsunami Warning" for all of the East Coast of Japan north of Shizuoka and Nagoya area.

1803: Sapporo has just learned that the official estimate is so far 10 dead in Sendai, with numbers obviously expected to rise significantly. Fires are still burning in Sendai. We have heard that the government has mobilized the Self-Defense Force to respond.

Sapporo has sent out a warden message through ACS+ and posted the message on Facebook and Mixi (a Japanese version of Facebook).

We will remain alert to hear reports of AMCITs in need of assistance.

1812: Just got word from a JET that works at the Miyagi Prefecture office:

...We are currently trying to establish contact with the 72 JETs in Miyagi (not including Sendai JETs) and so far have confirmed that 40 of them are okay. 19 of the remaining 32 are American and I will let you know when we have confirmed their safety...

Comment from Sapporo - JETs and other English teachers likely make up the majority of AMCITs in the Sendai area, the area hit hardest by the quake.

#### 1840 – March 11

All - Naha has accounted for our staff, including our FSN who is traveling in Tokyo. A very minor tsunami hit the Amami Islands (in our district) at 1810 and the main island of Okinawa shortly afterwards. OPG reports no damage. We also checked with the Amami city government (in our district) and they also report no damage. Tsunamis are still projected to hit southern Okinawan islands but estimates are that they will be minor. According to the police, Naha airport remains open and there is no plan to close the airport.

USFJ UPDATE ON MIL INSTALLATIONS AND PERSONNEL IN JAPAN: USFJ has also stood its command center and has been receiving reports from mil installations across Japan. As of 1835 they report:

- no fatalities or casualties to SOFA personnel in Japan
- minimal damage to Misawa AB; no other damage to mil installations in Japan

#### 1836 – March 11

News just came that the Prime Minister will declare a state of emergency regarding the nuclear radiation leak at the Fukushima plant shortly. (Cubas)

#### 1835 – March 11

As of 1446, nuclear:  
29 facilities no troubles reported.  
11 stopped due to earthquakes  
8 stopped for inspection  
9 continue to function  
(Tokyo TV)

#### 1834 hours – March 11

While the earthquake was felt in the Osaka area there does not appear to have been any damage. We received reports that a half meter tsunami warning is in effect but don't have an update on that at this time. All personnel are accounted for. Staff at the Consulate felt the building sway but some family members at the housing compound between Osaka and Kobe did not feel it. Lastly, an airport contact said large numbers of people from Nagoya and Tokyo area were heading to Kansai area airports to catch flights. (Snider)

#### 1831 hours – March 11



TV news just reported radiation leak from the #1 plant. (Cubas)

1829 hours – March 11

Evacuation suggestion, not yet an order, Kagoshima, Oita and Miyazaki prefectures, in Kyushu.

Miyazaki port had 1.4 m tsunami, extensive flooding along the coast. Similar effects on some remote southern islands.

(Cubas)

1824 hours – March 11

Prime Minister Kan to speak in about 10 minutes on nuclear situation.

40+ injured in Tokyo, 4 unconscious

8 buried in debris in Fukushima prefecture.

1820 hours – March 11

53 or more fires in 8 prefectures.

Disaster Central (Japanese) is damaged and not functioning.

1808 hours – March 11

Total deaths confirmed thus far: 13

By prefecture:

5 Fukushima

1 Ibaraki

5 Iwate

1 Honda Factory

1 Chiba

Missing: 8, Fukushima prefecture

Tokyo: Kudankaikan building collapse or partial collapse, 25 injured.

Tokyo Big Site (conference/tourist area: 4 injured)

Still no public transportation

Ibaraki airport: ceiling fell

U.S. Costco shopping center in Machida (Tokyo outskirts) collapsed; 9 injured

1759 hours – March 11

Update on TV news:

Fukushima prefecture had second earthquake, 5:48 p.m. magnitude 5.8

Five deaths confirmed in Iwate prefecture as of 5:00 p.m.

No electricity in the Tohoku area; Tohoku is most of the main island of Honshu, northern area. About five prefectures.

Large whirlpool shown off the coast of Ibaraki prefecture.

1749 hours – March 11

Preliminary reports are around fires and tsunamis. Here in downtown Tokyo we're not seeing exterior damage on buildings. Our Embassy residential units have some interior damage – furniture toppled, etc.

We have posted a warden message and are trying to get word out via Twitter.

We're trying several means to contact you by phone.

We continue to have aftershocks.

We have no reports of official personnel, dependents, or American Citizens injured at this time.

Rail and subway are down.

There is another warning now for a major aftershock.

Paul Fitzgerald  
CG

1711 hours – March 11

Summary from Japanese news:

5:30 p.m. Jpan time

50cm tsunami in Toyama Prefecture

10 meter Tsunami reported not confirmed  
Entire East coast of Japan on tsunami watch

Public transportation not running:  
Not running: all trains, including bullet trains  
No reports of train accidents

One confirmed death

Refinery in Chiba on fire

8.4 magnitude flashed on news report.

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**From:** RMTFACTSU\_ELNRC <RMTFACTSU\_ELNRC@ofda.gov>  
**Sent:** Sunday, March 13, 2011 1:18 PM  
**To:** Marshall, Jane; LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; McIntyre, David  
**Subject:** FW: SECDEF Authority and Funding Memo to PACOM  
**Attachments:** SECDEF Memo to PACOM.jpg

**Categories:** FOIA

All,

Attached is a delegation of authority from SECDEF to the PACOM Commander for the Japan response, including the authority to:

- transport non-DOD personnel and supplies
- search and rescue by aircraft and ships
- damage assessment
- provision of medical assistance
- purchase of relief commodities
- refueling and sustainment operations

This does not mean that DOD will execute all of the above missions, but it means that they have the authority to do so. The memo notes that all support should be coordinated with USAID, and DOD purchase of relief supplies should be consistent with USAID best practices for disaster response.

The memo authorizes up to \$35m in OHDACA (DOD's humanitarian funding) for the Japan support.

If/when the DART makes specific requests to DOD for disaster assistance support, PACOM will be able to draw down on this funding.

Best,  
Kate

Kate Legates  
Steve Catlin  
Military Liaison Officers  
Pacific Tsunami and Japan Earthquake Response Management Team  
USAID/DCHA/OFDA  
[Rmtpactsu\\_mlo@ofda.gov](mailto:Rmtpactsu_mlo@ofda.gov)  
202-712-0053/1009



THE SECRETARY OF DEFENSE  
1000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-1000

MEMORANDUM FOR COMMANDER, U.S. PACIFIC COMMAND

SUBJECT: Humanitarian Assistance to the Government of Japan

Pursuant to Section 2561 of title 10, United States Code, you are authorized to support U.S. Government disaster relief operations in Japan to alleviate the devastation caused by the March 11, 2011 earthquake in Japan, consistent with the following delegated authorities.

I hereby delegate to the Commander, U.S. Pacific Command (USPACOM), or his designees, the authority to expend Overseas Humanitarian, Disaster, and Civic Aid (OHDACA) funds to render humanitarian assistance on a non-reimbursable basis to include the transportation of non-DoD personnel and supplies, search and rescue by aircraft and ships, damage assessment, provision of medical assistance and purchase of relief commodities, and refueling and sustainment operations.

All support should be undertaken in coordination with the U.S. Agency for International Development (USAID), the lead federal agency for foreign disaster response. DoD-purchased relief supplies should be consistent with USAID best practices for disaster response.

I hereby approve an exception to policy and authorize transportation of non-DoD personnel and cargo aboard U.S. military aircraft and vessels. Transportation of relief supplies and personnel may be on a non-reimbursable basis if the DoD transportation is: 1) resourced with OHDACA appropriations; or 2) already scheduled and the transportation is on a space-available, non-interference basis at no increased cost to the Department.

DoD OHDACA funding is available for this purpose and is directed for use in supporting this request, but shall not exceed \$35,000,000. For audit purposes, USPACOM is required to keep records of all transportation provided pursuant to this authority.

cc:  
USD(C)  
USD(P)  
CJCS



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**From:** RMTPACTSU\_ELNRC <RMTPACTSU\_ELNRC@ofda.gov>  
**Sent:** Sunday, March 13, 2011 1:17 PM  
**To:** Marshall, Jane; LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; McIntyre, David  
**Subject:** (SBU) 03.13.11 - USAID Administrator's Report on the Pacific Tsunami and Japan Earthquake #3  
**Attachments:** (SBU) 03.13.11 - USAID Administrator's Report on Pacific Tsunami and Japan Earthquake #3.pdf  
**Categories:** FOIA

Please find attached and pasted below the Administrator's Report on the Pacific Tsunami and Japan Earthquake #3, dated March 13, 2011. *Information in this document is sensitive but unclassified and designated for internal U.S. Government use only; please handle accordingly.*—

If you experience formatting issues in the text below, please refer to the attached document.

If you would like to be added or removed from this distribution list, please email [RMTPACTSU\\_INC@ofda.gov](mailto:RMTPACTSU_INC@ofda.gov).

**Karey Haywood and Helen Ho**  
*Information Coordinators*  
Pacific Tsunami and Japan Earthquake Response Management Team  
[RMTPACTSU\\_INC@ofda.gov](mailto:RMTPACTSU_INC@ofda.gov)  
202-712-0039

**Pacific Tsunami and Japan Earthquake Humanitarian Update #3**  
**March 13, 2011**

(b)(5)

(b)(5)

(b)(5)





**USAID**  
FROM THE AMERICAN PEOPLE

## Administrator's Report

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### Pacific Tsunami and Japan Earthquake Humanitarian Update #3 March 13, 2011

(b)(5)

(b)(5)

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**From:** RMTFACTSU\_ELNRC <RMTFACTSU\_ELNRC@ofda.gov>  
**Sent:** Sunday, March 13, 2011 1:16 PM  
**To:** Marshall, Jane; LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; McIntyre, David  
**Subject:** FW: Japan Exec Sec Memo received at OSD  
**Attachments:** Japan EQ Tsunami - Final with clearance names (2).docx

**Categories:** FOIA

FYI

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**From:** RMTFACTSU\_MLO  
**Sent:** Sunday, March 13, 2011 12:25 PM  
**To:** RMT\_FACTSU; DART\_FACTSU; ofdaPACOM  
**Subject:** Japan Exec Sec Memo received at OSD

All,

Here is the final version of the ExecSec Memo State sent to DOD for non-reimbursable support in Japan (transportation and logistics).

Best,  
Kate

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**From:** Schneider, Caroline M [mailto:SchneiderCM@state.gov]  
**Sent:** Sun 3/13/2011 12:23 PM  
**To:** RMTFACTSU\_ELNRC; RMTFACTSU\_MLO; RMTFACTSU\_STATE; Goldberg, Joshua W  
**Subject:** RE: Exec Sec Memo received at OSD

I don't have the signed copy but here's the copy as I sent it to the Watch.

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**From:** RMTFACTSU\_ELNRC [mailto:RMTFACTSU\_ELNRC@ofda.gov]  
**Sent:** Sunday, March 13, 2011 11:46 AM  
**To:** Schneider, Caroline M  
**Subject:** RE: Exec Sec Memo received at OSD

Caroline, is there an attachment?

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**From:** Schneider, Caroline M [mailto:SchneiderCM@state.gov]  
**Sent:** Sunday, March 13, 2011 11:44 AM  
**To:** RMT\_FACTSU; Goldberg, Joshua W  
**Cc:** Task Force 1  
**Subject:** FW: Exec Sec Memo received at OSD

FYI.

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**From:** Moore, Anna W  
**Sent:** Sunday, March 13, 2011 11:43 AM  
**To:** SES-O\_CMS; TaskForce-1

**Cc:** SES-O\_SWO; Matier, Paul T  
**Subject:** Exec Sec Memo received at OSD

All,  
The Memo was washfaxed and OSD confirmed receipt.  
Best,

*Anna Moore*  
*State Department Operations Center*  
*202.647.1512*

**UNCLASSIFIED**

**MEMORANDUM FOR MICHAEL L. BRUHN  
EXECUTIVE SECRETARY  
DEPARTMENT OF DEFENSE**

**SUBJECT: Request for DOD Support for USG Disaster Assistance in Support of  
the Government of Japan**

(b)(5)

(b)(5),(b)(6)

Approved:

Drafted: Japan Task Force

Cleared: EAP: Joe Donovan - ok  
S/ES-O: Paul Matier - ok  
S/ES-O/CMS: Karen Zareski - ok  
D(S): Casey Mace - ok  
D(N): Maya Seiden - ok  
P: Nancy Leon - ok  
M: Suzanne McPartland - ok  
PM: Scott Page - ok  
RM: Donna Boardley - ok  
L: Kevin Gleeson - ok  
F: Paula Lynch - ok  
USAID/OFDA/RMT: MBrennan/Kate Legates - ok  
Embassy Japan: DATT Cooper/John Beed - ok  
DOD/OSD: NClark - ok

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**Subject:** 2011 Pacific Basin Earthquake/Tsunami ESF-8 Conference Call  
**Location:** 877-700-1237; PC: (b)(6)  
**Start:** Tue 3/15/2011 11:00 AM  
**End:** Tue 3/15/2011 12:00 PM  
**Recurrence:** (none)  
**Meeting Status:** Accepted  
**Organizer:** OS Secretarys Operations Center  
**Categories:** FOIA

**AGENDA:**

**2011 Pacific Basin Earthquake/Tsunami ESF-8 Conference Call**

**Phone: 877-700-1237**

**Passcode:** (b)(6)

**Objective: Discussion of current response operations and future actions.**

HHS – Opening Comment

- Quick summary on any HHS issues/concerns

Regional Updates:

IRTC

- Region IX
- Region X

EMG Updates:

EMG OPS/FIELD OPS/OFRD OPS

EMG Logs

EMG Plans

EMG A/F

Other OPDIVs/STAFF DIVs:

FDA update

Supporting Agencies:

DOS update

NRC update

USDA update

EPA update

Other supporting Agencies update

Questions:

Adjournment & Closing Comments:

Time for the next conference call: TBD



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**From:** RMTFACTSU\_ELNRC <RMTFACTSU\_ELNRC@ofda.gov>  
**Sent:** Sunday, March 13, 2011 11:23 AM  
**To:** Marshall, Jane; LIA11 Hoc; LIA01 Hoc; LIA07 Hoc; McIntyre, David  
**Subject:** 2400 Mar 13 - Latest update on Japan earthquake  
**Attachments:** 2011-03-12 running earthquake news updates with times 2400 - Mar 13.docx

**Categories:** FOIA

See below:

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**From:** Ou, Andrew H  
**Sent:** Sunday, March 13, 2011 11:04 AM  
**To:** Ou, Andrew H; Sim, Hyon B; Mears, Jeremy M; Lee, Ti-Ying; Ryan, Emmett Jerome; Hotz, Raymond E; Forsberg, Aaron P; Whitney, Thomas C; Chen, Perry Y; Burluson, Edward C; Wakahiro, Gary S; Utschig, Andrew S; Bernier-Toth, Michelle; Fitzgerald, Paul M; Zareski, Karen B; Shelbourn, Brian L; Cubas, Jason R; Christopher, William W; Kaneshiro, Claire K; Greene, Raymond F; Stewart, Jonas D; Ries, John N; Dong, Edward K; Jenks, Darrell A; Washburn, Lisa L; Tokyo-Visa-Officers-DL; Roos, John; Luke, Robert S; Ries, John N; Dong, Edward K; Stewart, Jonas D; Greene, Raymond F; Cubas, Jason R; Fuller, Matthew G; Basalla, Suzanne I; Hinds, Lynda J; (b)(6); Cipullo, Timothy L; Cherry, Ronald C; Dresser, Heather L (EAP/J); TOKYO POL All; Wood, Robert A; Nawn, Jeff  
**Cc:** Zumwalt, James P; Chipman, Alan R; Engstrom, Aaron; Forbes, James A; Martin, Timothy W; Rathweg-Weitz, Abbey H; Whitten, Richard V; Young, Joseph M; Operations Center; Young, Joseph M; Lyons, Thomas H; CA-Taskforce; Snider, Marc A; Kaneshiro, Claire K; SES-O; SES-O\_CMS; Lyons, Thomas H; Snider, Marc A; Yoo, Donny H; Tomlinson, Christina; Roberts, Richard M; Kaneshiro, Claire K; AVECILLA, Juan T; Chadwick, Michael J; Dieker, Mark S; CA-Taskforce; Ponce, Timothy F; Korff, Meena F; TaskForce-1; CA-Taskforce; Brown, Benjamin A; Wuebbels, Mark C; Osaka-Kobe All State Americans; Sapporo ALL; Naha All; 'lia.hac@nrc.gov'; Fukuoka Americans; Nagoya-Americans-DL; Yokohama-FSI-DL; TOKYO ECON Americans; Tilman, Justin E; 'justin.tilman@nasa.gov'; Sakurai, Joy M; Stewart, Bruce J; Sauer, David M; (b)(6); Cipullo, Timothy L  
**Subject:** 2400 Mar 13 - Latest update on Japan earthquake

23:56, March 13, 2011 Sunday: Iwate prefectural government contact told Sapporo Consulate General that one Amcirt JET was missing: Dickson Montgomery who was assigned in Rikuzen Hakata, a small town on the Iwate coast.

23:55, March 13, 2011 Sunday: State Dept. Task Force asks that offers from the U.S. private sector to assist with relief efforts be forwarded to OFDA at the following email: [rmtfactsu\\_elc@ofda.gov](mailto:rmtfactsu_elc@ofda.gov). Please copy the State Dept. Task Force ("zTask Force 1 Mailbox" in the GAL) for their situational awareness.

23:41, March 13, 2011 Sunday: A Washington-based American Airlines executive reports that he is contacting the FAA and the NSC regarding the power plant situation. All of its flights to/from Tokyo (except Los Angeles) fly over the affected area, therefore AA has "heightened concern."

23:20, March 13, 2011 Sunday: According to NHK News, TEPCO reports that the pumping system for sending water to reactors #1, #2, and #4 of Fukushima Nuclear Power Plant #2 (Daini) is not working due to tsunami damage, and the cooling system is therefore not functioning. NHK reports that TEPCO will change the pumping system monitors of each unit sometime in the early morning hours.

23:15, March 13, 2011 Sunday: NHK reports that not all traffic lights have power generators, according to the police. During the rolling black-outs, policemen will be directing traffic, but not at all intersections. During the blackout period, the police are discouraging the use of cars and motorcycles. If you must drive them, they recommend to driving slowly and cautiously in those areas.

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**From:** Ou, Andrew H

**Sent:** Sunday, March 13, 2011 11:12 PM

**To:** Sim, Hyon B; Mears, Jeremy M; Lee, Ti-Ying; Ryan, Emmett Jerome; Hotz, Raymond E; Forsberg, Aaron P; Whitney, Thomas C; Chen, Perry Y; Burleson, Edward C; Wakahiro, Gary S; Utschig, Andrew S; Bernier-Toth, Michelle; Fitzgerald, Paul M; Zareski, Karen B; Shelbourn, Brian L; Cubas, Jason R; Christopher, William W; Kaneshiro, Claire K; Greene, Raymond F; Stewart, Jonas D; Ries, John N; Dong, Edward K; Jenks, Darrell A; Washburn, Lisa L; Tokyo-Visa-Officers-DL; Roos, John; Luke, Robert S; Ries, John N; Dong, Edward K; Stewart, Jonas D; Greene, Raymond F; Cubas, Jason R; Fuller, Matthew G; Basalla, Suzanne I; Hinds, Lynda J; [REDACTED] (b)(6); Cipullo, Timothy L; Cherry, Ronald C; Dresser, Heather L (EAP/J); TOKYO POL All; Wood, Robert A; Nawn, Jeff

**Cc:** Zumwalt, James P; Chipman, Alan R; Engstrom, Aaron; Forbes, James A; Martin, Timothy W; Rathweg-Weitz, Abbey H; Whitten, Richard V; Young, Joseph M; Operations Center; Young, Joseph M; Lyons, Thomas H; CA-Taskforce; Snider, Marc A; Kaneshiro, Claire K; SES-O; SES-O\_CMS; Lyons, Thomas H; Snider, Marc A; Yoo, Donny H; Tomlinson, Christina; Roberts, Richard M; Kaneshiro, Claire K; AVECILLA, Juan T; Chadwick, Michael J; Dieker, Mark S; CA-Taskforce; Ponce, Timothy F; Korff, Meena F; TaskForce-1; CA-Taskforce; Brown, Benjamin A; Wuebbels, Mark C; Osaka-Kobe All State Americans; Sapporo ALL; Naha All; 'lia.hac@nrc.gov'; Fukuoka Americans; Nagoya-Americans-DL; Yokohama-FSI-DL; TOKYO ECON Americans; Tilman, Justin E; 'justin.tilman@nasa.gov'; Sakurai, Joy M; Stewart, Bruce J; Sauer, David M; [REDACTED] (b)(6); Cipullo, Timothy L

**Subject:** 2312 Mar 13 - Latest update on Japan earthquake

22:35, March 13, 2011 Sunday: Jiji.com reports that the Japanese Self Defense Force (SDF) has rescued 6,500 people on the March 13 alone and that 9,700 people were rescued since the earth quick hit. US carrier Ronald Reagan also joined the rescue efforts in the afternoon on the 13th. The number of SDF rescue forces will increase from the current 50,000 to 100,000 people within a week.

22:35, March 13, 2011 Sunday: Asahi has announced the schedule (Japanese only for now) for rolling black-outs starting tomorrow at 6:20AM. We believe that no black-out is planned for central Tokyo. See the link: <http://www.asahi.com/national/update/0313/TKY201103130277.html>

22:16, March 13, 2011 Sunday: NHK reported that President Shimizu of Tokyo Electric Power Company (TEPCO) said at a press conference at 8:30 pm that TEPCO is considering using seawater to cool off the reactor Unit #2 of Fukushima Daiichi Nuclear Power Plant.

22:15, March 13, 2011 Sunday: According to Jiji press reports, Fukushima prefecture will start radiation exposure screening at all evacuation stations, hopefully as early as the 15<sup>th</sup>. The prefectural requested more instruments and staff to measure radiation from the central government. They are planning to establish 80 teams of investigators to check for radiation exposure. There are about 470 or 480 evacuation stations in the prefecture. The teams will visit all of those sites and conduct screening for those who request it.

22:00, March 13, 2011, Sunday: Mike Daschbach, Andrew Ou, and Eriko Marks assume duty at Joint Task Force.

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**From:** Sim, Hyon B

**Sent:** Sunday, March 13, 2011 10:03 PM

**To:** Sim, Hyon B; Mears, Jeremy M; Lee, Ti-Ying; Ryan, Emmett Jerome; Hotz, Raymond E; Forsberg, Aaron P; Whitney, Thomas C; Chen, Perry Y; Burleson, Edward C; Wakahiro, Gary S; Utschig, Andrew S; Bernier-Toth, Michelle; Fitzgerald, Paul M; Zareski, Karen B; Shelbourn, Brian L; Cubas, Jason R; Christopher, William W; Kaneshiro, Claire K; Greene, Raymond F; Stewart, Jonas D; Ries, John N; Dong, Edward K; Jenks, Darrell A; Washburn, Lisa L; Tokyo-Visa-Officers-DL; Roos, John; Luke, Robert S; Ries, John N; Dong, Edward K; Stewart, Jonas D; Greene, Raymond F; Cubas, Jason R; Fuller, Matthew G; Basalla, Suzanne I; Hinds, Lynda J; [REDACTED] (b)(6); Cipullo, Timothy L; Cherry, Ronald C; Dresser, Heather L (EAP/J); TOKYO POL All; Wood, Robert A

**Cc:** Zumwalt, James P; Chipman, Alan R; Engstrom, Aaron; Forbes, James A; Martin, Timothy W; Rathweg-Weitz, Abbey H; Whitten, Richard V; Young, Joseph M; Operations Center; Young, Joseph M; Lyons, Thomas H; CA-Taskforce; Snider, Marc A; Kaneshiro, Claire K; SES-O; SES-O\_CMS; Lyons, Thomas H; Snider, Marc A; Yoo, Donny H; Tomlinson, Christina; Roberts, Richard M; Kaneshiro, Claire K; AVECILLA, Juan T; Chadwick, Michael J; Dieker, Mark S; CA-Taskforce; Ponce,

Timothy F; Korff, Meena F; TaskForce-1; CA-Taskforce; Brown, Benjamin A; Wuebbels, Mark C; Osaka-Kobe All State Americans; Sapporo ALL; Naha All; 'lia.hac@nrc.gov'; Fukuoka Americans; Nagoya-Americans-DL; Yokohama-FSI-DL; TOKYO ECON Americans; Tilman, Justin E; 'justin.tilman@nasa.gov'; Sakurai, Joy M; Stewart, Bruce J; Sauer, David M; (b)(6); Cipullo, Timothy L

**Subject:** 2200 Mar 13 - Latest update on Japan earthquake

21:44, March 13, 2011, Sunday: According to Yahoo Japan, TEPCO announced it was getting ready to flood Fukushima NPP No. 1, reactor No. 2 with sea water to help cool it down. This brings to three the number of reactors TEPCO is trying to cool using sea water (NPP No. 1, Reactors No. 1, 2 and 3).

21:41, March 13, 2011, Sunday: According to Yahoo Japan, 1,710,000 households are still without power, and an additional 440,000 households were without gas service. Power and gas companies were distributing portable kerosene burners and cans of kerosene at evacuation facilities.

21:39, March 13, 2011, Sunday: According to Mainichi, 1,500 are dead and 340,000 are displaced. Most of the unaccounted for are from the towns of Minami-Sanriku in Miyagi Prefecture (10,000 unaccounted, total population 17,000) and Otsuchi in Iwate Prefecture (10,000 unaccounted, total population 16,000).

21:38, March 13, 2011, Sunday: According to Reuters, France recommended its citizens leave the Tokyo region of Japan on Sunday, citing the risk of further earthquakes and uncertainty about the situation at its damaged NPPs. "It seems reasonable to advise those who do not have a particular reason to stay in the Tokyo region to leave the Kanto (Tokyo) region for a few days," a statement on the French embassy website in Japan said. "We strongly advise our nationals not to travel to Japan and we strongly recommend delaying any voyage planned," it added.

21:22, March 13, 2011, Sunday: According to Kyodo news, TEPCO announced that radiation released from the NPPs will NOT affect humans.

21:20, March 13, 2011, Sunday: According to Kyodo news, TEPCO will avoid rolling blackouts in central Tokyo.

21:09, March 13, 2011, Sunday: Both Alan Remick from Department of Energy (DOE) and Joe Hughart from Health and Human Services (HHS) have arrived at the Hotel (b)(6) and will be heading over to the Ministry of Foreign Affairs (MOFA) shortly for meetings with their Nuclear and Industrial Safety Agency (NISA) counterparts. MOFA Nuclear Division's Kazumi Yamada confirmed she shared the seven questions from DOE with NISA this evening, ahead of the planned meeting.

21:00, March 13, 2011, Sunday: According to Manichi, the DPJ and LDP have agreed to reconvene the Diet after a "natural break" from March 14-18 (there was a call for a formal break in Diet activity, defined by resolution). Among the top issues on the Diet agenda are the possible need for emergency legislation permitting a short-term tax increase to pay for the costs of recovery operations, as well as other measures to temporarily increase GOJ revenue and a three-month extension of the tax cut package scheduled to expire in March.

21:00, March 13, 2011, Sunday: According to Manichi, Japanese company executives are expressing concern that the rolling blackouts scheduled to begin on March 14 may seriously affect many industries, possibly including such "lifeline" services as supermarkets. Automobile companies such as Honda and Suzuki which have factories in the Kanto area are also likely to be heavily affected. Large department stores such as Mitsukoshi are also considering temporarily closing their stores, as they will not be able to depend upon generator power for such long periods.

21:00, March 13, 2011, Sunday: According to Yahoo News, Tohoku Power Company (covering North-East Japan) announced that it will not be conducting rolling black-outs on March 14.

Hyon Bo Sim  
Second Secretary and Political Officer  
Embassy of the United States of America, Tokyo, Japan

<http://tokyo.usembassy.gov>  
telephone: (03) 3224-5499  
mobile: (b)(6)  
fax: (03) 3224-5322  
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SBU  
This email is UNCLASSIFIED.