

**DEPARTMENT OF ENERGY SITUATION REPORT**

**Earthquake & Tsunami in Japan**

4 April 2011

1800 (EDT) UPDATE

*Note: Beginning with the 1800 March 31 SITREP, each entry is labeled with the time and date of the latest SITREP that updated the information. Paragraphs with no indicated time were prepared prior to the 1800 March 31 SITREP and were included as the latest information available. Less frequent information updates are available from Japanese agencies. (0600, 4/2 SITREP)*

**POWER PLANT UPDATE AND OTHER NUCLEAR ISSUES**

(NOTE: JST = EDT + 13 hours; EDT = GMT/UTC - 4 hours).

Per TEPCO, there is currently a large amount of radioactive waste water in the turbine buildings of the Fukushima Daiichi reactors (the turbine building of Unit 2 has extremely high level radioactive waste water). In accordance with GoJ regulations, TEPCO has decided to discharge to the sea approximately 10,000 tons of the accumulated low level radioactive water and a total of 1,500 tons of the low level radioactive subsurface water stored in the sub drain pits of Unit 5 and 6. Per TEPCO's evaluation, the impact on the discharge of the low radioactive waste water to the sea if a person eats adjacent fish and seaweeds every day, that person will receive approximately 0.6 mSv of effective radioactive doses per year for adults (equal to one-fourth of the annual radioactive dose to which the general public is exposed in nature). At 1900 JST of April 4, TEPCO began discharging to the sea the low radioactive waste water stored in the Central Radioactive Waste Disposal Facility and the low level radioactive subsurface water stored in the sub drain pits. (1800, 4/4 SITREP)

Per the New York Times, TEPCO is rushing storage tanks to Fukushima to store the radioactive water, though the tanks may not arrive until mid-April, a company spokesman said. TEPCO also plans to moor a giant artificial island off the coast to store contaminated water, though getting the island in place will take at least a week. (1800, 4/4 SITREP)

Per the Nuclear Energy Institute, TEPCO's attempts to seal a crack in a concrete enclosure for cabling in Unit 2 are ongoing after initial efforts failed. TEPCO injected a color tracer into the enclosure in an effort to track the flow of water. That test confirmed the radioactive water is from multiple sources. TEPCO is planning to install underwater silt barriers near the intake for Unit 2 to help contain the contaminated water. The silt-blocking fence will take several days to prepare according to Hidehiko Nishiyama, deputy director-general of the Nuclear and Industrial Safety Agency (NISA). (1800, 4/4 SITREP)

**Updates on Cooling Efforts and Cooling Water Management:**

Per the IAEA, as of 21:15 JST April 4, fresh water continues to be injected into the Unit 1 reactor pressure vessel through the feed-water line (NRC says fire extinguisher line citing TEPCO) using a pump powered with offsite electric power. Per the IAEA, as of 21:15 JST April 4, fresh water continues to be injected into the Units 2 and 3 reactor pressure vessels through the fire extinguisher line using a pump powered with offsite electric power. (1800, 4/4 SITREP)

**Updates on Electrical Power Restoration Efforts:**

Per IAEA, Japanese authorities reported that for units 1, 2 and 3, external power supply is now being used to power the pumps that are injecting fresh water into the reactors, thus replacing temporary electrical pumps. The switch to external power supply occurred on 2 April at 2302 EDT for Unit 1; 2312 EDT for Unit 2; and 2318 EDT for Unit 3. Some lighting has been reactivated in the turbine buildings of Units 1, 2, 3 and 4. (0600, 4/4 SITREP)

**Radiation Detection Updates:**

Per the Nuclear Energy Institute, radiation dose rates at the Daiichi site continue to fall. Recent readings showed 12.4 millirem per hour at the main gate, 7.4 millirem per hour at the west gate and 78 millirem per hour on the side of the administration building facing the reactors. (1800, 4/4 SITREP)

Cabinet Secretary Yukio Edano also told a news conference on Sunday April 3 that recent checkups have found no problems in the thyroid of children in Fukushima area, but cautioned that the Japanese government expects that it will likely be several months before radiation will stop being released from the Fukushima Daiichi nuclear plant. (1800, 4/3 SITREP)

According to JAIF, Japan's health ministry reported on Saturday April 2 that test results of tap water show that radiation levels are within safety standards in all municipalities, although recommendations for restrictions on drinking water for infants only, as a precaution, are still in place in the village of Ii-tate in Fukushima prefecture. (1800, 4/3 SITREP)

**(Official Use Only) Field Measurements Update (Updated each SITREP):**

Recent events of past 24 hours:

- ◆ **Field Monitoring and Assessment**
  - AMS UH-1 (1): Flew along eastern flanks of mountains on west side of Tohuka Expressway north to Koryama to north side of Fukushima
  - AMS UH-1 (2): Surveyed coast south of Mito

- AMS C-12: Flew in valley west of Fukushima Daiichi NPP, from south near Shirasaka to mountains on west side, north to Shiroy, and east to ocean. *Did not fly in afternoon due to high winds.*
- AMS HH-60: Reassigned by USAF
- Ground teams: Continued surveys of military installations in Tokyo area in support of aerial mapping. Teams conducted beta/gamma surveys and HPGe in-situ gamma spectrum measurements

Planned operations over the next 24 hours:

- Aerial Monitoring
  - AMS UH-1: Re-flight along eastern flank of mountains on the west side of Tohoku Expressway north to Koriyama to the north side of Fukushima
  - AMS C-12: Conduct survey near shoreline and over ocean north of plant. When complete, fly the north coast in toward Sendai.
- Ground Monitoring
  - Complete beta/gamma exposure rate surveys. Radio nuclide evaluations are to include in-situ measurement assessment of gamma isotopes.
  - Continue monitoring activities at the US Embassy Japan and the Embassy Resident Towers in Tokyo, CMOC TOC at Yokota AB, and Yokosuka Naval Base.
  - Continuing work to implement the Early Warning Array utilizing Infields and SMC.

**Updates by Reactor Unit** (Updated each SITREP)

**Fukushima Dai-ichi Unit 1 reactor (NRC priority 1):**

Per the IAEA, as of 21:15 JST April 4, fresh water continues to be injected into the reactor pressure vessel through the feed-water line (NRC says fire extinguisher line citing TEPCO) at an indicated flow rate of 6 m<sup>3</sup>/h using a pump powered with offsite electric power. (1800, 4/4 SITREP)

Per JAIF at 0600 JST 4 April, reactor parameters are: RPV pressure (A) 0.304 MPa Gauge (G), (B) 0.603 MPa G; water level 1.70/1.65 meters below the top of the fuel rods; containment vessel pressure 0.150 MPa absolute (abs); RPV feedwater nozzle 242.6 °C; SFP thermography 25 °C at 0750 3 April (1800, 4/4 SITREP)

Per NRC at 0430 EDT 3 April, Spent Fuel Pool (SFP) has 292 assemblies with last transfer of 64 assemblies from reactor to SFP in March 2010. Per NISA, a test water spray over the SFP using concrete pump truck was carried out on 2 April to confirm the appropriate position for water spray. Intermittent steam-like substance emitting from SFP 1, 2, 3, 4 from injection/spray. (Source: JAIF) (1800, 4/4 SITREP)

From 3 April Kyodo news, NISA stated that TEPCO will inject nitrogen into the containment vessel of the No. 1 reactor on Tuesday or later to help prevent the risk of more hydrogen explosions caused by overheating of the reactor. (0600, 4/3 SITREP)

On March 24, the NRC estimated that Unit 1 had 70% core damage. The reactor vessel and primary containment are intact.

**Fukushima Dai-ichi Unit 2 reactor (NRC priority 2):**

Per the IAEA, as of 21:15 JST April 4, fresh water continues to be injected into the reactor pressure vessel through the fire extinguisher line at an indicated flow rate of 8 m<sup>3</sup>/h using a pump powered with offsite electric power. (1800, 4/4 SITREP)

Per JAIF 0600 JST 4 April, RPV pressure (A) -0.011 MPa G, (B) -0.016 MPa G; water level 1.50 meters below the top of the fuel rods; containment vessel pressure 0.100 MPa abs.; the indicated temperature at the feed water nozzle of the RPV is 138.9 °C and bottom head is not reported; SFP temperature is 48°C. (1800, 4/4 SITREP)

Per NRC update 0430 EDT, 4 April, rad levels greater than 100R/hr at discharge to sea (Source: IAEA 4/3)

**Fukushima Dai-ichi Unit 3 (NRC priority 3):**

Per the IAEA, as of 21:15 JST April 4, fresh water continues to be injected into the reactor pressure vessel through the fire extinguisher line at an indicated flow rate of 7 m<sup>3</sup>/h using a pump powered with offsite electric power. (1800, 4/4 SITREP)

Per JAIF at 0330 JST April 4, RPV pressure is (A) 0.007 MPa G (B) -0.081 MPa G; reactor water level is (A) 1.8 m (B) 2.25m below the top of the fuel rods; containment vessel pressure 0.1073 MPa abs.; SFP thermography 56 °C as of 0750 April 3 (1800, 4/4 SITREP).

Per IAEA at 21:15 JST on April 3, the indicated temperature at the feed water nozzle of the RPV is about 114 °C (validity still under investigation) and at the bottom of RPV is about 90 °C. (1800, 4/4 SITREP)

As of April 1, 1100 JST, water level in trench is 1.55m below floor level. (1800, 4/3 SITREP)

Fresh water injection to the unit 3 Spent Fuel Pool via the Cooling and Purification Line continues.

On March 24, the NRC estimated that Unit 3 had 33% core damage. Unit #3 SFP contains 514 elements.

**Fukushima Dai-ichi Unit 4 reactor (NRC priority 4):**

Per JAIF, the SFP thermography was 42 °C at 0750 April 3. Per NISA, freshwater spray to the Spent Fuel Pool using Concrete Pump Truck(50t/h) took place at 0825 UTC on April 1. Unit 4 is shutdown with the core removed to the spent fuel pool in December for maintenance on the reactor. Unit #4 SFP contains 1331 elements.

**Fukushima Dai-ichi Unit 5 reactor (NRC priority 5):**

Per JAIF, as of 0800 JST 4 April, the SFP water temp was 36.8°C. (1800, 4/4 SITREP)

Per NISA as of NISA March 30: Reactor pressure 0.108 MPa abs, reactor water level 2.161 m above the top of the fuel rods, reactor water temperature is 29.9°C. Power was switched to off-site power on March 21. Unit 5 was in a refueling outage at the time of the earthquake. Unit #5 SFP contains 946 elements.

**Fukushima Dai-ichi Unit 6 reactor (NRC priority 6):**

Per JAIF, as of 0800 JST 4 April, SFP water temp was 21°C. (1800, 4/4 SITREP) Per NISA as of 0600 March 31: Reactor pressure 0.104 MPa, Reactor water temp 32.6°C, reactor water level 1.703 m above the top of the fuel rods. Power supply to Unit 6 was switched from temporary power to permanent supply on March 25. Unit 6 was in a refueling outage at the time of the earthquake. Reactor is in cold shutdown conditions (less than 100°C). Cooling of the reactor cores continues. Unit #6 SFP contains 876 elements.

**Fukushima Daiichi Common Spent Fuel Pool**

At 1000 on 18 March, it was confirmed that water level in the pool was secured. Japanese authorities have confirmed that fuel assemblies there are fully covered by water. The IAEA reported on April 4, 2011, that the Common Spent Fuel Pool temperature was 32 °C at 23:10 UTC on 2 April.

**Other Information**

**UPDATE ON US ASSISTANCE (Per 4/4 10:19 email from J. Tilden)**

DOE INL is providing one specially modified TALON robot, three radiation sensors, five radiation-hardened cameras, and one GammaCam, with appropriate instructions (video and written) to be shipped to the GoJ tomorrow and arrival in Japan by the end of the work week. (1800, 4/4 SITREP)

Per TEPCO-NISA's request, DOE SRS is providing six stainless steel ~16,000 gallon storage tanks and one ~1000 gallon high activity trailer, all of which can support water characterization and process development efforts. Further, a specialized pump from Hanford was also offered. Transportation, likely commercial, for this equipment is being arranged with no arrival date yet established. (1800, 4/4 SITREP)

NNSA Office of Emergency Response is providing two portable radiation detectors early this week to GoJ, with another two to four detectors being shipped later this week. (1800, 4/4 SITREP)

Currently, the GOJ is becoming more focused in its requirements and their outreach. As of now, the US Embassy is developing what will be the primary, validated list of equipment/support needs, vetted by both GOJ/TEPCO and various USG entities. The NRC-led, Industry Consortium working group will be subordinate to this, continuing to develop/evaluate and update a broader list of equipment needs articulated by various GOJ entities that may or may not be yet validated as a requirement. DOE will have an

overarching "Transfer of Title" document completed this week for all DOE or NNSA equipment transfers. (1800, 4/4 SITREP)

#### **ENERGY INFRASTRUCTURE:**

No update.

#### **CONTACTS WITH GOJ OFFICIALS:**

An interagency group met on Monday, April 4 at 1900 JST with U.S. Embassy officials, DOE and NRC. Participants included Deputy Chief Cabinet Secretary Fukuyama, special advisor to the Prime Minister Goshi Hosono, Diet member Akihisa Nagashima, and representatives from the Ministry of Foreign Affairs and the Ministry of Defense. Other key participants included representatives from TEPCO, NISA, METI, MEXT, JSDF and the Nuclear Safety Commission. (1800, 4/1 SITREP)

#### **Media Reports**

**"Japan seeks Russian help to end nuclear crisis"** By Chizu Nomiyama and Shinichi Saoshiro

TOKYO (Reuters) - Japan has asked Russia to send a special radiation treatment ship used to decommission nuclear submarines to help in treating radioactive liquids. The ship, a joint venture between Japan and Russia, was designed to help decommission nuclear submarines in Russia's Pacific fleet in Vladivostok, ensuring radioactive waste was not dumped into the Sea of Japan.

Small levels of radiation from the plant have been detected as far away as Europe and the United States and several countries have banned milk and produce from the vicinity. Singapore extended a ban on Japanese food imports on Monday after detecting radiation in more fruit and vegetable imports. While Kan asked the European Union on Monday for a calm response to Japanese imports. The EU has urged radiation testing of Japanese food and feed imports."

<http://www.reuters.com/article/2011/04/04/us-japan-idUSTRE72A0SS20110404>

**"Tokyo Electric struggles to pin down source of seawater pollution" (Kyodo, April 4, 2011)**

Tokyo Electric Power Co. used colored powder Monday to trace the source of highly radioactive water leaking into the sea near the troubled Fukushima Daiichi nuclear power plant, while mulling the use of silt-barriers in the sea to prevent the further spread of radiation.

<http://english.kyodonews.jp/news/2011/04/82995.html>

**"Japan to release radioactive water into sea" (Reuters, April 4, 2011)**

Japanese engineers on Monday were forced to release radioactive water into the sea while resorting to desperate measures such as using bath salts to try to find the source of the leaks at a crippled nuclear power complex.

<http://www.reuters.com/article/2011/04/04/us-japan-idUSTRE72A0SS20110404>

**“Radiation levels drop or remain flat” (NHK, 1316 JST, April 4, 2011)**

Radiation levels continue to drop or remain flat on Monday morning in many locations around the disabled Fukushima Daiichi nuclear power plant.

[http://www3.nhk.or.jp/daily/english/04\\_16.html](http://www3.nhk.or.jp/daily/english/04_16.html)

**“Fukushima puts voluntary ban on shiitake” (NHK, 1247 JST, April 4, 2011)**

The Fukushima prefectural government has urged farmers in Iwaki City to halt shipments of shiitake after one sample of the mushrooms tested was discovered to contain radioactive substances exceeding the legal limit.

[http://www3.nhk.or.jp/daily/english/04\\_14.html](http://www3.nhk.or.jp/daily/english/04_14.html)

**CONTACT INFORMATION:**

**Nuclear Incident Team in the Emergency Operations Center**

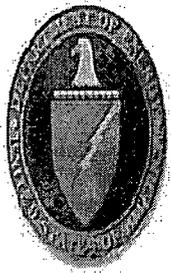
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**Office of the Deputy Secretary 202-586-5500**

**Watch Schedule April 4:**

Karyn Durbin                      1600-2000/4 April  
Michael Worley

Parrish Staples                      0400-0800/5 April  
Ronald Hagen

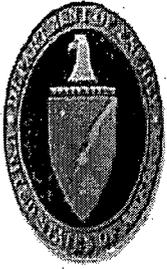


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# Japan Earthquake Response April 4, 2011 // 1800 EDT



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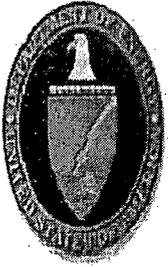
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**Contact: DOE/NNSA Nuclear Incident  
Team:**

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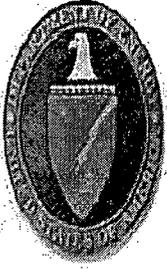


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# Current Status

- ♦ No major changes in airborne radiation levels at the Fukushima Daiichi Power Plant
- ♦ Additional power plant status in accompanying text SITREP
  - External power supply now being used to power pumps injecting fresh water into reactor Units 1, 2 and 3, thus replacing temporary electrical pumps
  - Unit 1: Reactor water level stable, core damage est. 70%. Freshwater injection continues. Electrical power line connected. Pumping freshwater in spent fuel pool.
  - Unit 2: Reactor water level stable, core damage est. 33%. Freshwater injection continues. Electrical power line connected. Pumping freshwater in spent fuel pool.
  - Unit 3: Reactor water level stable, core damage est. 33%. Freshwater injection continues. Electrical power line connected. Pumping freshwater in spent fuel pool. trucks pumping water into spent fuel pools.
  - Unit 4: Spraying continues periodically for the spent fuel pool. Power restored. Trucks pumping water into spent fuel pool.
- ♦ On a trial basis, synthetic resin was sprayed to prevent the spread of radioactive dust near the common spent fuel pool.
- ♦ At 1900 JST. of April 4, TEPCO began discharging to the sea the low radioactive waste water stored in the Central Radioactive Waste Disposal Facility and the low level radioactive subsurface water stored in the sub drain pits
- ♦ The Japanese national government is now encouraging evacuation for local residents within the 20-30 km radius of the site boundary. This is a slight change from the previous voluntary evacuation with shelter in place for the 20-30 km zone.

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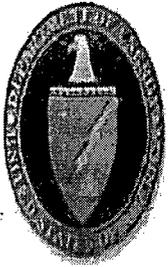
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# Current Status (continued)

- ◆ TEPCO continues to address issues with water in trenches outside turbine buildings of Units 1, 2 and 3
  - A 20 cm crack has been found in a pit connected to the Unit 2 turbine building and is leaking radioactive water into the ocean with rad levels exceeding 1000 mSv/hr. TEPCO attempted to use polymeric and other materials on April 3 to seal the leak, but was unsuccessful. TEPCO is currently injecting white dye to trace the path of radioactive water from points of origin through the complex and into the ocean
  - TEPCO constructing a water treatment facility to reduce activity in water discharged to the sea and considering using a large floating platform to store up to 10,000 tons of radioactive water.



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# DOE/NNSA Emergency Response

## ◆ Command, Control, Coordination:

- **Nuclear Incident Team (NIT):** Coordinating overall emergency response
- **Policy Working Group (PWG):** Coordinating overall policy
- **Senior Energy Official:** Primary Manager of deployed field teams
- **Liaisons:** DART, USPACOM, USAID, NRC

## ◆ Modeling

- **National Atmospheric Release Advisory Center (NARAC):** conducting predictive radioactive atmospheric dispersion modeling

## ◆ Monitoring and Sampling

- **Consequence Management Response Team (CMRT):** Conducting ground monitoring, air sampling and initial results analysis
- **Aerial Measuring System (AMS):** Conducts aerial detection for mapping radiological ground material deposits
- Currently 3 platforms: 1 Fixed, 2 Rotary

## ◆ Assessment

- **Consequence Management Home Team (CMHT):** Scientific assessment of data updated daily from ground measurements and AMS flights

## ◆ Medical Consultation

- **Radiation Emergency Assistance Center/Training Site (REACTS):** Providing medical advice about radiological exposure

## Deployed\* (39)

### Yokota AB

- (2) SEO
- (1) SEO Staff
- (24) CMRT
- (7) AMS

### US Embassy Tokyo

- (4) DART LNO

### USPACOM HQ

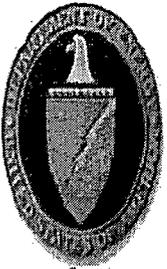
- (1) LNO

### Upcoming personnel changes:

Several personnel enroute to/from Japan 3-6 April.

\*The number deployed does not currently reflect DOE/NNSA personnel assisting in nuclear energy (NE) aspects of the response.

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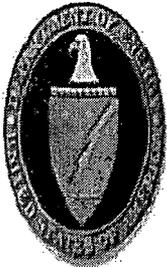
# Significant Events: Past 24 Hrs.

## International Engagement:

- ◆ Met with MOFA and MEXT to develop a bilateral aerial monitoring and data sharing plan
  - GOJ plans to issue a press release highlighting joint activities on or about 5 April
- ◆ Continued coordination on providing High Purity Germanium detectors to GOJ for sample analysis; ongoing coordination for US laboratory analysis of Japanese collected soil samples

## Nuclear Incident Team:

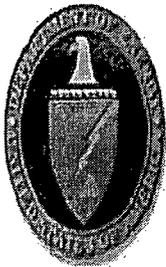
- ◆ Provided ground monitoring and aerial measuring data spreadsheets to CDC, FDA, HHS, USDA, EPA, NRC, DHS, NR, DIA and WH
- ◆ Continued Coordination of rotation for deployed personnel



# Significant Events: Past 24 Hrs.

## Operations:

- ◆ Modeling
  - NARAC: Continued work on products normalizing NARAC models to measurements taken in the field. Preliminary assessment of time correlated deposition and further assessment of dose rate measurements correlated to actual weather patterns
- ◆ Field Monitoring and Assessment
  - AMS UH-1 (1): Flew along eastern flanks of mountains on west side of Tohuka Expressway north to Koryama to north side of Fukushima
  - AMS UH-1 (2): Surveyed coast south of Mito
  - AMS C-12: Flew in valley west of Fukushima Daiichi NPP, from south near Shirasaka to mountains on west side, north to Shiroy, and east to ocean. *Did not fly in afternoon due to high winds.*
  - AMS HH-60: Reassigned by USAF
  - Ground teams: Continued surveys of military installations in Tokyo area in support of aerial mapping. Teams conducted beta/gamma surveys and HPGe in-situ gamma spectrum measurements
- ◆ Medical Consult
  - Nothing substantial to report

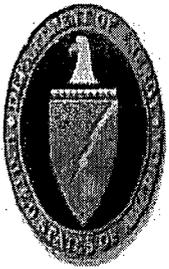


# Mission Summary

Type	Last 24 Hours	Total
AMS Flight Hours	15	221.5
Field Measurements	1330	97,883
Air Samples	10	143
Soil Samples	0	1

\* Duplicate data removed from aggregate total

Field measurements are a combination of DOE, DoD, and GOJ data including automated downloads from several remotely monitored stations. Figures accurate as of 1800 EDT 4 APR 11.



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# Data Providers

## ◆ Japan

- Ministry of Foreign Affairs (MOFA)
- Nuclear Safety Technology Center (NUSTEC)
- Tokyo Electric Power Company (TEPCO)
- Ministry of Agriculture, Forestry and Fisheries (MAFF)
- Ministry of Education, Culture, Sports, Science, and Technology (MEXT)
- Ministry of Health, Welfare and Labor
- Nuclear and Industrial Safety Agency (NISA)
- Nuclear Safety Commission

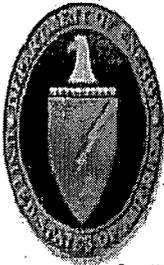
## ◆ Consequence Management Response Team

- CMRT/CMOC
- AMS
- AFRAT

## ◆ External US

- Japan Emergency Command Center, US Embassy, Tokyo
- USAF, BSC Commander
- USAF, WC-135 Constant Phoenix
- Futenma Marine Corps Air Station
- Nuclear Regulatory Commission
- Naval Reactors

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# Guide to Interpretation

## US EPA Derived Response Levels (DRLs) for Evacuation and Relocation

### ■ Early Phase DRL

If a person is in danger of receiving an external radiation dose of 1 Rem over 4 days, the EPA recommends evacuation until radiation levels decrease. This area is indicated by red.

### ■ First Year DRL

If a person is in danger of receiving an external radiation dose greater than 2 Rem during the first year, the EPA recommends relocation until radiation levels decrease. This is not an urgent action because the dose is received over a full year. This area is indicated by orange.

### ■ Fifty Year DRL

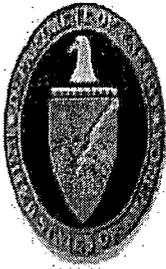
If a person is in danger of receiving an external radiation dose greater than 5 Rem over 50 years, the EPA recommends relocation until radiation levels decrease. This is not an urgent action because the dose is received over fifty years. This area falls within the second year DRL.

### ■ Second Year DRL

If a person is in danger of receiving an external radiation dose of greater than 0.5 Rem in the second year (or any subsequent year), the EPA recommends relocation until radiation levels decrease. This area is indicated by yellow.

These calculations account for multiple variables. For instance, radiation is most intense in the first days following its release therefore dose reduction may be met by evacuating early in the response.

Protective actions are frequently expressed in dose rates. The dose rate is an indicator that residents would accumulate the threshold dose if they stayed in the area the entire time expressed (e.g. 1 year, 2 years, 50 years).



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# Guide to Interpretation

## Areas at Risk for Agricultural Contamination

Aerial measurements can indicate areas where agricultural monitoring and sampling should occur, although they cannot directly determine the amount of contamination of agricultural products grown in these areas.

AMS monitoring results in areas beyond 25 miles from the Fukushima Daiichi reactors show areas where dose rates are many times higher than historical background.

The measured external dose rates in these areas are not high enough to warrant evacuation or relocation of the population, however, lower levels of radioactive contamination in agricultural products provide more of a risk because the radioactive material can be ingested into the body. Agricultural monitoring in these areas may be warranted.

- ◆ Areas 10 to 100 times historical background are indicated by green.
- ◆ Areas 2 to 10 times historical background are indicated by light blue.
- ◆ Areas at or near historical background are indicated by dark blue.

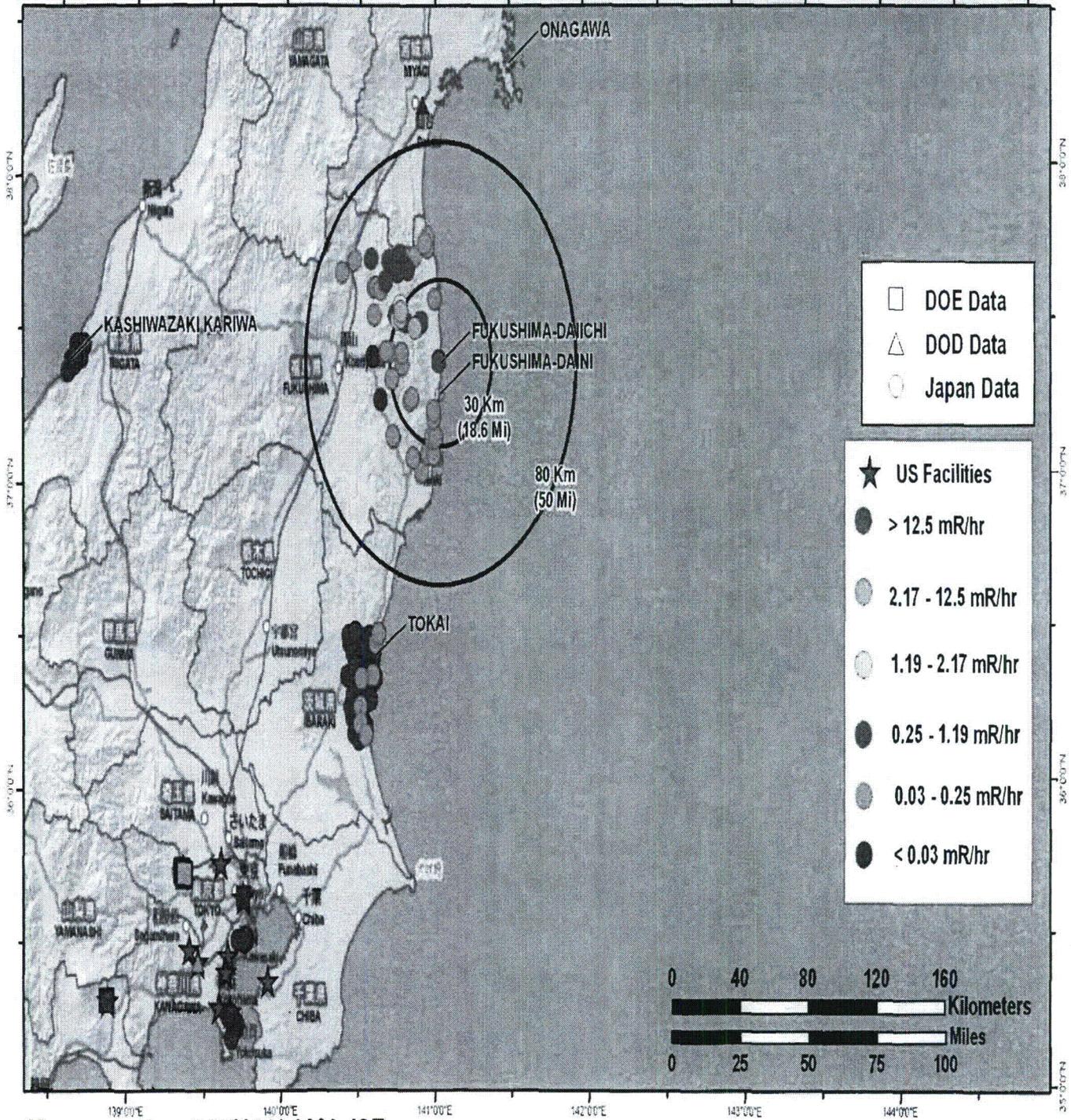
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# Field Monitoring Results

April 4 01:00 to April 5 01:00 JST

## FUKUSHIMA DAIICHI JAPAN



Map created on 04052011 0200 JST  
Name: NIT 24hrsMonitoringResults 04Apr2011 0100

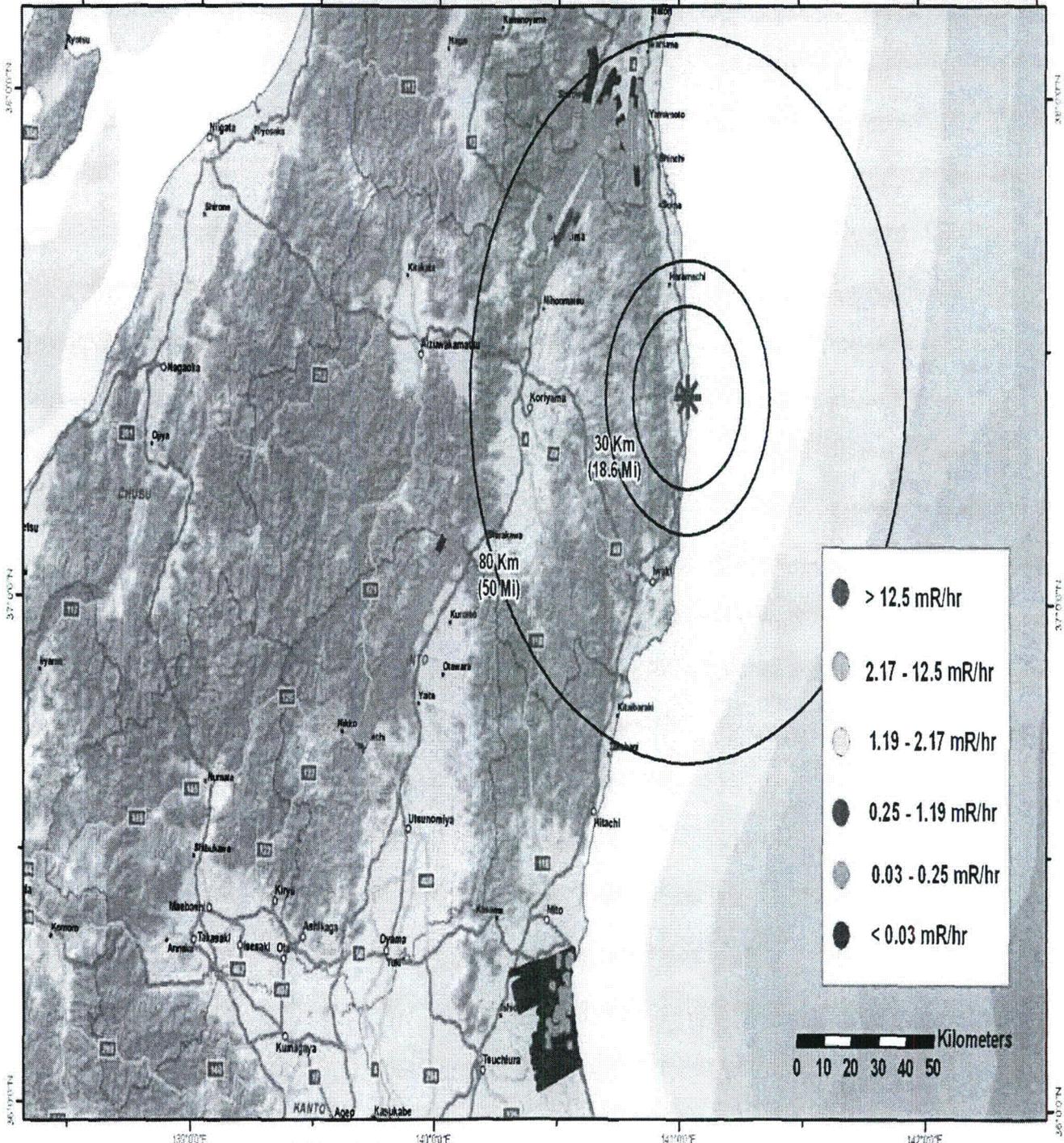
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Nuclear Incident Team DOE NIT  
Contact (b)(6)



# Aerial Monitoring Results Combined Flights (April 04, 2011)

## FUKUSHIMA DAIICHI JAPAN



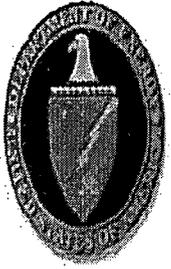
Map created on 04042011 2300 JST  
Name: NIT Combined Aerial Results 04Apr2011

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# Aerial and Ground Monitoring Data Assessment

- ◆ An assessment of measurements gathered through 4 April continues to show:
  - Radiation levels consistently below actionable levels for evacuation or relocation outside of 25 miles
  - Radiological material has not deposited in significant quantities since 19 March
  
- ◆ An assessment of measurements gathered at US military installations in the Tokyo area through 4 April shows:
  - Radiation levels far below actionable levels for evacuation or relocation
  - All aerial measurements at US facilities were less than 32  $\mu\text{R/hr}$  - a level that poses no known health risk
  - Monitoring of these locations will continue although no increases in deposited radiation are anticipated

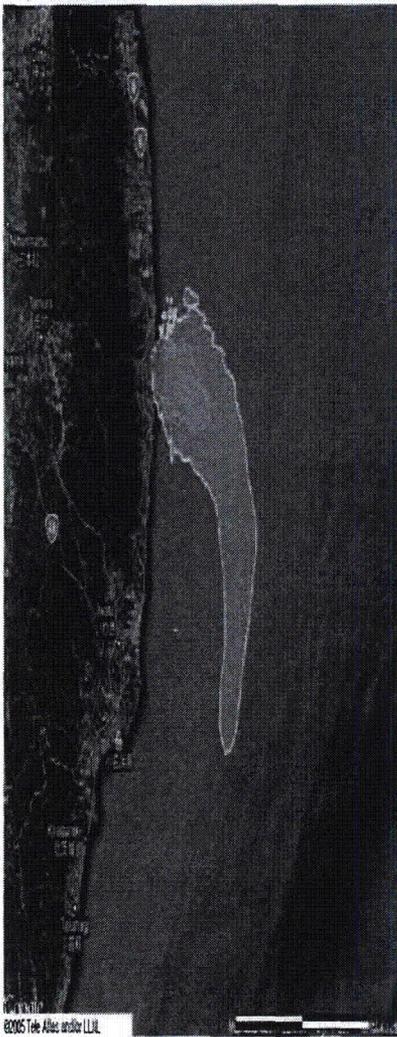
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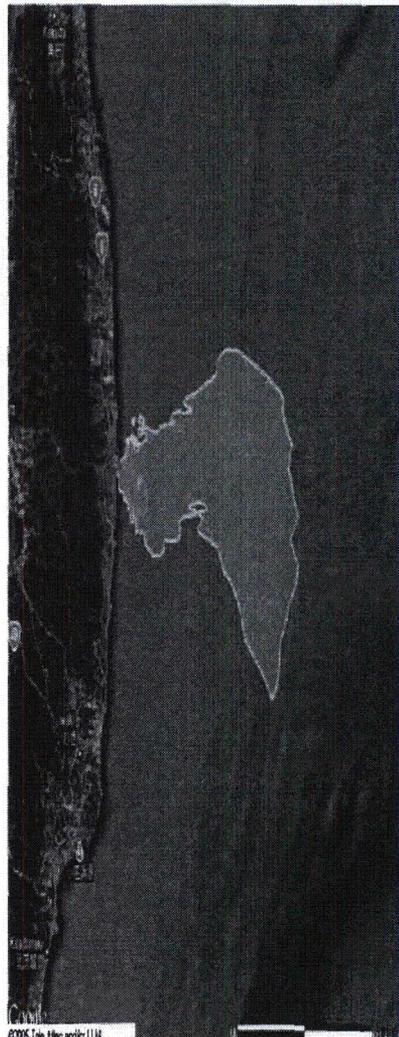
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# Forecasted Weather April 5-6, 2011

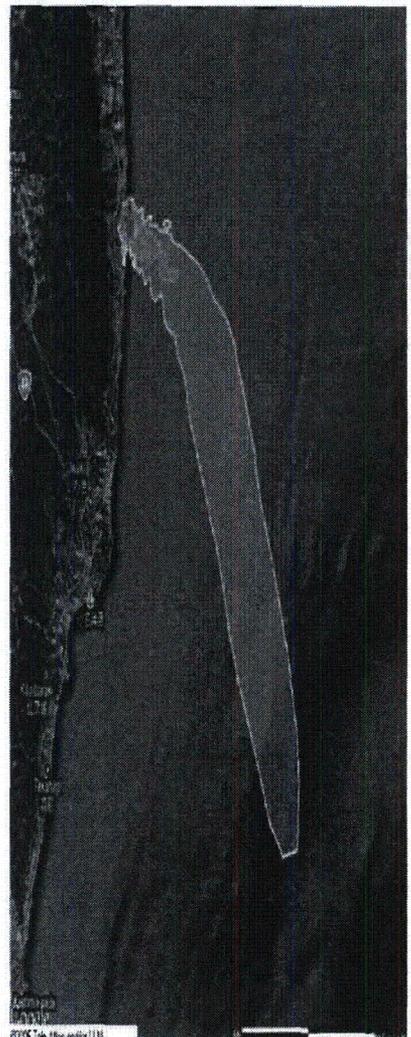
04/05/2011 08:00:00 JST



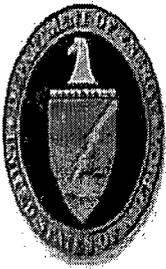
04/05/2011 20:00:00 JST



04/06/2011 08:00:00 JST



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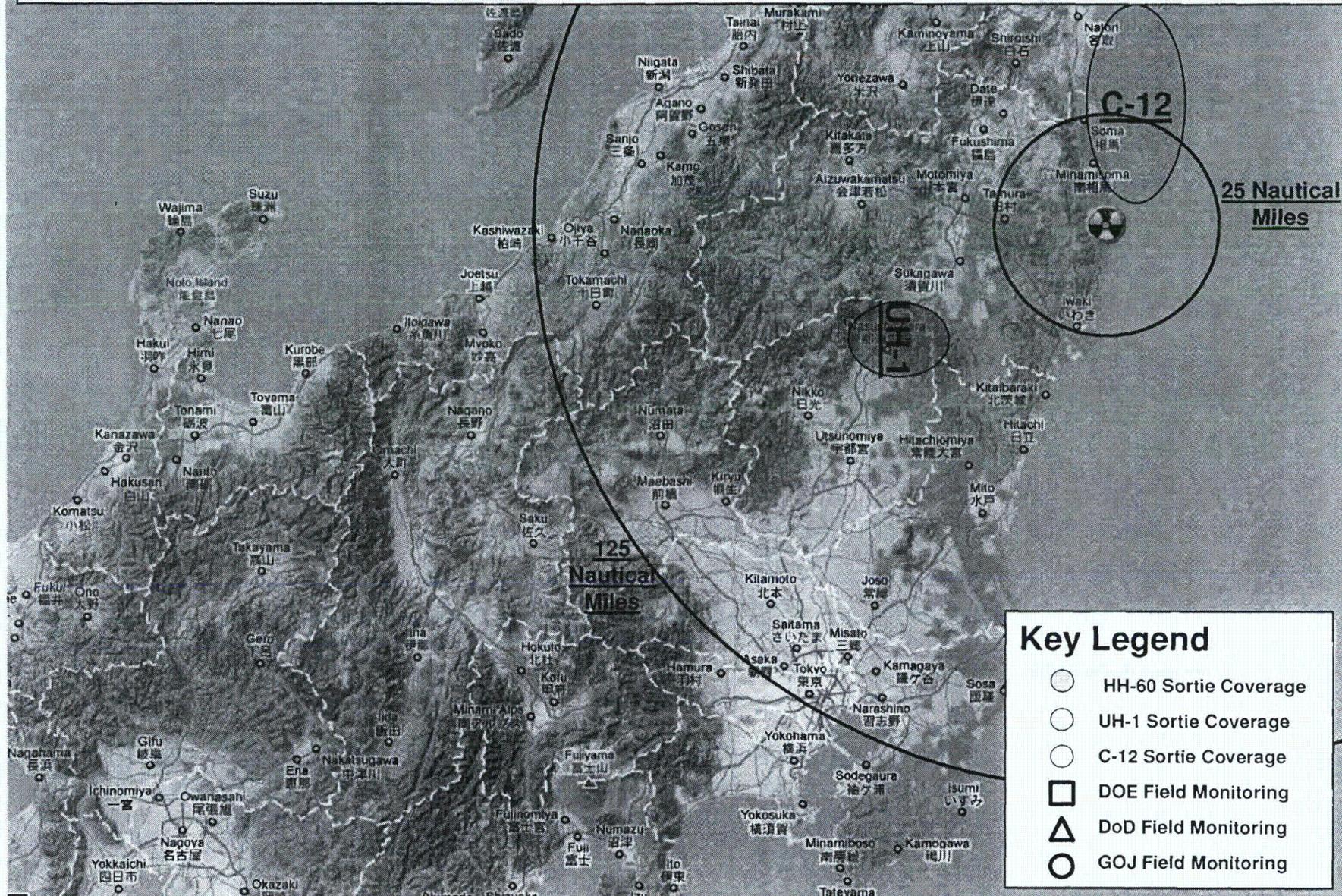
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# Planned Operations: Next 24 Hrs

- ◆ Aerial Monitoring
  - AMS UH-1: Re-flight along eastern flank of mountains on the west side of Tohuka Expressway north to Koriyama to the north side of Fukushima
  - AMS C-12: Conduct survey near shoreline and over ocean north of plant. When complete, fly the north coast in toward Sendai.
- ◆ Ground Monitoring
  - Complete beta/gamma exposure rate surveys. Radio nuclide evaluations are to include in-situ measurement assessment of gamma isotopes.
  - Continue monitoring activities at the US Embassy Japan and the Embassy Resident Towers in Tokyo, CMOC TOC at Yokota AB, and Yokosuka Naval Base.
  - Continuing work to implement the Early Warning Array utilizing Infields and SMC.

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# Planned Aerial/Field Monitoring Operations April 5, 2011 Operational Period



**DEPARTMENT OF ENERGY SITUATION REPORT**  
**Earthquake & Tsunami in Japan**

5 April 2011  
0600 (EDT) UPDATE

*Note: Beginning with the 1800 March 31 SITREP, each entry is labeled with the time and date of the latest SITREP that updated the information. Paragraphs with no indicated time were prepared prior to the 1800 March 31 SITREP and were included as the latest information available. Less frequent information updates are available from Japanese agencies. (0600, 4/2 SITREP)*

(NOTE: JST = EDT + 13 hours; EDT = GMT/UTC - 4 hours).

**POWER PLANT UPDATE AND OTHER NUCLEAR ISSUES**

Per TEPCO, there is currently a large amount of radioactive waste water in the turbine buildings of the Fukushima Daiichi reactors (the turbine building of Unit 2 has extremely high level radioactive waste water). In accordance with GoJ regulations, TEPCO has decided to discharge to the sea approximately 10,000 tons of the accumulated low level radioactive water and a total of 1,500 tons of the low level radioactive subsurface water stored in the sub drain pits of Unit 5 and 6. Per TEPCO's evaluation, the impact on the discharge of the low radioactive waste water to the sea if a person eats adjacent fish and seaweeds every day, that person will receive approximately 0.6 mSv of effective radioactive doses per year for adults (equal to one-fourth of the annual radioactive dose to which the general public is exposed in nature). At 1900 JST of April 4, TEPCO began discharging to the sea the low radioactive waste water stored in the Central Radioactive Waste Disposal Facility and the low level radioactive subsurface water stored in the sub drain pits. By noon Tuesday [2300 EDT 4/4], an estimated 3,430 tons of low level radioactive water was discharged into the Pacific Ocean. (0600, 4/5 SITREP)

Per the New York Times, TEPCO is rushing storage tanks to Fukushima to store the radioactive water, though the tanks may not arrive until mid-April, a company spokesman said. TEPCO also plans to moor a giant artificial island off the coast to store contaminated water, though getting the island in place will take at least a week. (1800, 4/4 SITREP)

Per the Nuclear Energy Institute, TEPCO's attempts to seal a crack in a concrete enclosure for cabling in Unit 2 are ongoing after initial efforts failed. TEPCO injected a color tracer into the enclosure in an effort to track the flow of water. That test confirmed the radioactive water is from multiple sources. TEPCO is planning to install underwater silt barriers near the intake for Unit 2 to help contain the contaminated water. The silt-blocking fence will take several days to prepare according to Hidehiko Nishiyama, deputy director-general of the Nuclear and Industrial Safety Agency (NISA). (1800, 4/4 SITREP)

Per Reuters, Japan has asked Russia to send the "Suzuran," a special radiation treatment ship used to decommission nuclear submarines by which treating radioactive liquids, Japanese media said. The ship, a joint venture between Japan and Russia, was designed to help decommission nuclear submarines in Russia's Pacific fleet in Vladivostok, ensuring radioactive waste was not dumped into the Sea of Japan. (0600, 4/5 SITREP)

**Update on Reactor Containment Vessels:**

According to the NRC's 4/4 1800 EDT Status Update, damage is suspected in the primary containment vessel of Unit 1 and there is a slow leakage. (0600, 4/5 SITREP)

**Updates on Cooling Efforts and Cooling Water Management:**

Per the IAEA, as of 21:15 JST April 4, fresh water continues to be injected into the Unit 1 reactor pressure vessel through the feed-water line (NRC says fire extinguisher line citing TEPCO) using a pump powered with offsite electric power. Per the IAEA, as of 21:15 JST April 4, fresh water continues to be injected into the Units 2 and 3 reactor pressure vessels through the fire extinguisher line using a pump powered with offsite electric power. (1800, 4/4 SITREP)

**Updates on Electrical Power Restoration Efforts:**

Per IAEA, Japanese authorities reported that for units 1, 2 and 3, external power supply is now being used to power the pumps that are injecting fresh water into the reactors, thus replacing temporary electrical pumps. The switch to external power supply occurred on 2 April at 2302 EDT for Unit 1; 2312 EDT for Unit 2; and 2318 EDT for Unit 3. Some lighting has been reactivated in the turbine buildings of Units 1, 2, 3 and 4. (0600, 4/4 SITREP)

**Radiation Detection Updates:**

Per JAIF as of 1500 JST on April 4, Radiation levels were 0.75mSv/h at the south side of the office building and 53µSv/h at the West gate. As of 1000 JST on April 4, 121 µSv/h at the Main gate. No significant change from previous report. (0600, 4/5 SITREP)

Per the Nuclear Energy Institute, radiation dose rates at the Daiichi site continue to fall. Recent readings showed 12.4 millirem per hour at the main gate, 7.4 millirem per hour at the west gate and 78 millirem per hour on the side of the administration building facing the reactors. (1800, 4/4 SITREP)

**(Official Use Only) Field Measurements Update (Updated each SITREP):**

**Recent events of past 24 hours:**

- **Field Monitoring and Assessment**

- AMS UH-1 (1): Survey along eastern flanks of mountains on west side of Tohoku Expressway north to Koriyama to north side of Fukushima
- AMS UH-1 (2): No mission today
- AMS C-12: Survey N and NE of Fukushima Daiichi plant near shoreline primarily over water
- Ground teams: Completed beta/gamma exposure rate surveys. Radio nuclide evaluations are to include in-situ measurement assessment of gamma isotopes. Continued monitoring activities at US Embassy Japan and Embassy Resident Towers in Tokyo, CMOE TOC at Yokota AB, and Yokuska Naval Base

**Planned operations over the next 24 hours:**

- Aerial Monitoring
  - AMS UH-1: Fly from Fukushima Daiichi plant south to 30 km line along coast
  - AMS C-12: Fly west of Fukushima Daiichi plant between 40-60 km
  - Flights are being coordinated with GOJ MEXT
    - All areas inside of 80 km from plant will be surveyed in period 6-12 April
    - AMS will fly inside 60 km line; MEXT will fly outside 60 km line
- Ground Monitoring
  - Complete beta/gamma exposure rate surveys. Radio nuclide evaluations are to include in-situ measurement assessment of gamma isotopes.
  - Continue monitoring activities at the US Embassy Japan and the Embassy Resident Towers in Tokyo, CMOE TOC at Yokota AB, and Yokuska Naval Base.
  - Continuing work to implement the Early Warning Array utilizing Infields and SMC.

**Updates by Reactor Unit** (Updated each SITREP)

**Fukushima Dai-ichi Unit 1 reactor (NRC priority 1):**

Per the IAEA, as of 21:15 JST April 4, fresh water continues to be injected into the reactor pressure vessel through the feed-water line (NRC says fire extinguisher line citing TEPCO) at an indicated flow rate of 6 m<sup>3</sup>/h using a pump powered with offsite electric power. (1800, 4/4 SITREP)

Per JAIF at 0600 JST 5 April, reactor parameters are: RPV pressure (A) 0.308 MPa Gauge (G); (B) 0.619 MPa G; water level 1.70/1.65 meters below the top of the fuel rods; containment vessel pressure 0.150 MPa absolute (abs); RPV feedwater nozzle 233.5 °C; SFP thermography 18 °C at 0720 4 April (0600, 4/5 SITREP)

Per NRC at 0430 EDT 3 April, Spent Fuel Pool (SFP) has 292 assemblies with last transfer of 64 assemblies from reactor to SFP in March 2010. Per NISA, a test water spray over the SFP using concrete pump truck was carried out on 2 April to confirm the

appropriate position for water spray. Intermittent steam-like substance emitting from SFP 1, 2, 3, 4 from injection/spray. (Source: JAIF) (1800, 4/4 SITREP)

**Fukushima Dai-ichi Unit 2 reactor (NRC priority 2):**

Per the IAEA, as of 21:15 JST April 4, fresh water continues to be injected into the reactor pressure vessel through the fire extinguisher line at an indicated flow rate of 8 m<sup>3</sup>/h using a pump powered with offsite electric power. (1800, 4/4 SITREP)

Per JAIF 0600 JST 5 April, RPV pressure (A) -0.018 MPa G, (B) -0.018 MPa G; water level 1.50 meters below the top of the fuel rods; containment vessel pressure 0.100 MPa abs (0600, 4/5 SITREP)

**Fukushima Dai-ichi Unit 3 (NRC priority 3):**

Per the IAEA, as of 0540 JST April 5, fresh water continues to be injected into the reactor pressure vessel through the fire extinguisher line at an indicated flow rate of 7 m<sup>3</sup>/h using a pump powered with offsite electric power. (1800, 4/4 SITREP)

Per JAIF 0540 JST April 5, RPV pressure is (A) 0.011 MPa G (B) -0.081 MPa G; reactor water level is 1.85m below the top of the fuel rods; containment vessel pressure 0.100 MPa abs.; (0600, 4/5 SITREP)

Per IAEA at 2115 JST on April 3, the indicated temperature at the feed water nozzle of the RPV is about 114 °C (validity still under investigation) and at the bottom of RPV is about 90 °C. (1800, 4/4 SITREP)

**Fukushima Dai-ichi Unit 4 reactor (NRC priority 4):**

Per JAIF, the SFP thermography was 30 °C at 0720 April 4. (0600, 4/5 SITREP) Per NISA, freshwater spray to the Spent Fuel Pool using Concrete Pump Truck(50t/h) took place at 0825 UTC on April 1. Unit 4 is shutdown with the core removed to the spent fuel pool in December for maintenance on the reactor. Unit #4 SFP contains 1331 elements.

**Fukushima Dai-ichi Unit 5 reactor (NRC priority 5):**

Per JAIF, as of 0800 JST 4 April, the SFP water temp was 35.5°C. (0600, 4/5 SITREP) Per NISA as of NISA March 30: Reactor pressure 0.108 MPa abs, reactor water level 2.161 m above the top of the fuel rods, reactor water temperature is 29.9°C. Power was switched to off-site power on March 21. Unit 5 was in a refueling outage at the time of the earthquake. Unit #5 SFP contains 946 elements.

**Fukushima Dai-ichi Unit 6 reactor (NRC priority 6):**

Per JAIF, as of 0700 JST 5 April, SFP water temp was 28.5°C. (0600, 4/5 SITREP) Per NISA as of 0600 March 31: Reactor pressure 0.104 MPa, Reactor water temp 32.6°C, reactor water level 1.703 m above the top of the fuel rods. Power supply to Unit 6 was switched from to temporary power to permanent supply on March 25. Unit 6 was in a refueling outage at the time of the earthquake. Reactor is in cold shutdown conditions (less than 100°C). Cooling of the reactor cores continues. Unit #6 SFP contains 876 elements.

### Fukushima Daiichi Common Spent Fuel Pool

At 1000 on 18 March, it was confirmed that water level in the pool was secured. Japanese authorities have confirmed that fuel assemblies there are fully covered by water. The IAEA reported on April 4, 2011, that the Common Spent Fuel Pool temperature was 32 °C at 23:10 UTC on 2 April.

### Other Information

#### **UPDATE ON USG COORDINATION**

USG and GOJ interagency crisis management teams met at 1900 on April 4, led on the U.S. side by the DCM, NRC team lead Chuck Casto, RADM Thomas Rowden, and USFJ Deputy Commander BG Blake Crowe. The Japanese side was led by Diet Member and Special Advisor to the Prime Minister Goshi Hosono who chaired for the Japanese side, along with Deputy Chief Cabinet Secretary Tetsuro Fukuyama. The Japanese side included senior Cabinet Secretariat officials and representatives of MOD, MOFA, METI, MEXT, MLIT, MHLW, NSC, NISA, and TEPCO. The Japanese side reported on progress to date by project teams on reactor confinement, spent fuel transfer and remote control equipment. The GOJ also reported that three additional project teams are already working at TEPCO on construction of a long-term, stable cooling system for the reactors; collection and recycling of radioactive waste water; and environmental impact of radioactivity. The U.S. side described a USG effort to harmonize and track requests and offers of assistance and provided a draft spread sheet and a one-page form proposed to be used for documenting future requests. The GOJ indicated it would review the information and prioritize its requests, while reiterating that the bilateral Crisis Management Team meeting should continue to serve as the central clearinghouse for GOJ requests. (0600, 4/5 SITREP)

According to NRC's April 4<sup>th</sup> 1800 EDT Status Update, it was discussed in the Agency Deputies meeting that DOE is the lead for interagency technical support to Japan. (0600, 4/5 SITREP)

According to NRC's April 4<sup>th</sup> 1800 EDT Status Update, a white paper is being developed for the return of U.S. citizens to the Tokyo area. The paper will be finalized by April 6<sup>th</sup>. (0600, 4/5 SITREP)

#### **UPDATE ON US ASSISTANCE (updated per 4/5 21:44 email from J. Tilden)**

No additional information on estimated arrival of Putzmeister concrete pump. (0600 4/5 SITREP)

DOE INL is providing one specially modified TALON robot, three radiation sensors, five radiation-hardened cameras, and one GammaCam, with appropriate instructions (video

and written) to be shipped to the GoJ on Tuesday 4/5 and arrival in Japan by the end of the work week. (0600, 4/5 SITREP)

Per TEPCO-NISA's request, DOE SRS is providing five stainless steel ~16,000 gallon storage tanks and one ~1000 gallon high activity trailer, all of which can support water characterization and process development efforts. Further, a specialized pump from Hanford was also offered. Transportation, likely commercial, for this equipment is being arranged with no arrival date yet established. (0600, 4/5 SITREP)

NNSA Office of Emergency Response is providing two portable radiation detectors early this week to GoJ, with another two to four detectors being shipped later this week. (1800, 4/4 SITREP)

Currently, the GOJ is becoming more focused in its requirements and their outreach. As of now, the US Embassy is developing what will be the primary, validated list of equipment/support needs, vetted by both GOJ/TEPCO and various USG entities. The NRC-led, Industry Consortium working group will be subordinate to this, continuing to develop/evaluate and update a broader list of equipment needs articulated by various GOJ entities that may or may not be yet validated as a requirement. DOE will have an overarching "Transfer of Title" document completed this week for all DOE or NNSA equipment transfers. (1800, 4/4 SITREP)

#### **ENERGY INFRASTRUCTURE:**

No update.

#### **CONTACTS WITH GOJ OFFICIALS:**

An interagency group met on Monday, April 4 at 1900 JST with U.S. Embassy officials, DOE and NRC. Participants included Deputy Chief Cabinet Secretary Fukuyama, special advisor to the Prime Minister Goshi Hosono, Diet member Akihisa Nagashima, and representatives from the Ministry of Foreign Affairs and the Ministry of Defense. Other key participants included representatives from TEPCO, NISA, METI, MEXT, JSDF and the Nuclear Safety Commission. (1800, 4/1 SITREP)

#### **Media Reports**

**"Removal of 60,000 tons of radioactive water eyed at Fukushima plant" (Kyodo News, April 5)**

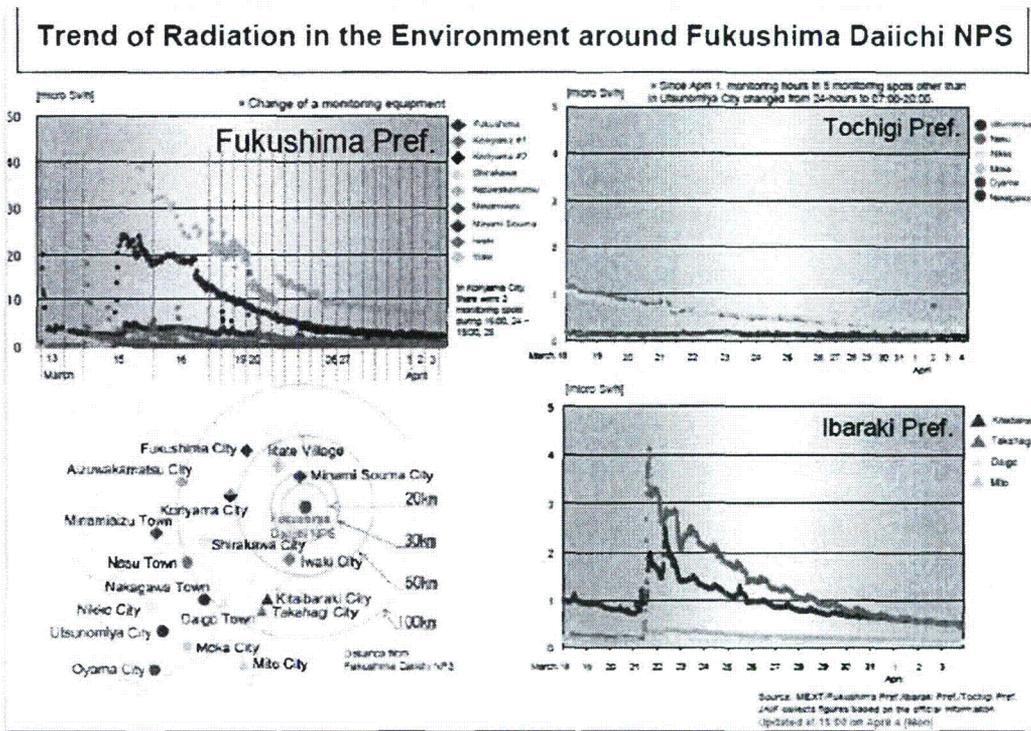
A total of 60,000 tons of radioactive water is believed to be flooding the basement of reactor buildings and underground trenches connected to them at the crisis-hit Fukushima nuclear plant, the industry minister said Tuesday. TEPCO began dumping low-level radioactive water Monday as an emergency step to secure room for the storage of more highly contaminated water. TEPCO aims to dispose of a total of 11,500 tons of low-level tainted water by this weekend. By noon Tuesday, an estimated 3,430 tons of such low

radioactive water had been discharged into the Pacific Ocean from the plant on the coast, TEPCO said.

The Nuclear and Industrial Safety Agency said the 60,000 tons of water -- 20,000 tons each from the Nos. 1-3 reactor buildings and trenches -- will be stored in tanks at the units, a facility for nuclear waste disposal at the site, an artificial floating island called a "megafloat," U.S. Navy barges and provisional tanks. The provisional tanks will be shipped to the Fukushima plant by the end of this month, it added.

<http://english.kvodonews.jp/news/2011/04/83228.html>

**“Trend of Radiation in the Environment around Fukushima Daiichi NPS”** (Graphic at Japan Atomic Industry Forum, April 5).



[http://www.jaif.or.jp/english/news\\_images/pdf/ENGNEWS01\\_1301966088P.pdf](http://www.jaif.or.jp/english/news_images/pdf/ENGNEWS01_1301966088P.pdf)

**“Japan seeks Russian help to end nuclear crisis”** By Chizu Nomiya and Shinichi Saoshiro

TOKYO (Reuters) - Japan has asked Russia to send a special radiation treatment ship used to decommission nuclear submarines to help in treating radioactive liquids. The ship, a joint venture between Japan and Russia, was designed to help decommission

nuclear submarines in Russia's Pacific fleet in Vladivostock, ensuring radioactive waste was not dumped into the Sea of Japan.

Small levels of radiation from the plant have been detected as far away as Europe and the United States and several countries have banned milk and produce from the vicinity. Singapore extended a ban on Japanese food imports on Monday after detecting radiation in more fruit and vegetable imports. While Kan asked the European Union on Monday for a calm response to Japanese imports. The EU has urged radiation testing of Japanese food and feed imports.”

<http://www.reuters.com/article/2011/04/04/us-japan-idUSTRE72A0SS20110404>

“Japan to release radioactive water into sea” (Reuters, April 4, 2011)

Japanese engineers on Monday were forced to release radioactive water into the sea while resorting to desperate measures such as using bath salts to try to find the source of the leaks at a crippled nuclear power complex.

<http://www.reuters.com/article/2011/04/04/us-japan-idUSTRE72A0SS20110404>

**CONTACT INFORMATION:**

**Nuclear Incident Team in the Emergency Operations Center**

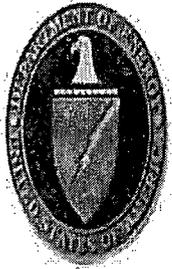
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**Office of the Deputy Secretary 202-586-5500**

**Watch Schedule April 5:**

Parrish Staples                      0400-0800/5 April  
Ronald Hagen

Rhys Williams                      1600-2000/5 April  
Craig Welling



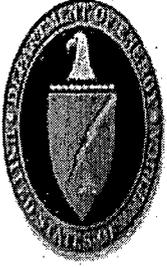
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# Japan Earthquake Response April 5, 2011 // 0600EDT



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AR/13



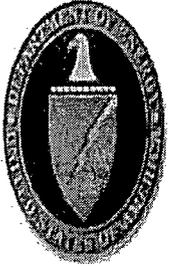
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prior clearance from U.S. DOE**

**Contact: DOE/NNSA Nuclear Incident  
Team:**

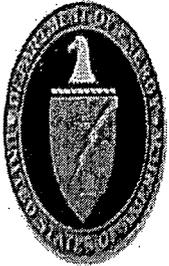
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# Current Status

- ◆ No major changes in airborne radiation levels at the Fukushima Daiichi Power Plant
- ◆ Status of reactors 1-4 (water/pressure levels, status of water pumps, and electrical connectivity) provided in accompanying text SITREP
- ◆ The Japanese national government is now encouraging evacuation for local residents within the 20-30 km radius of the site boundary. This is a slight change from the previous voluntary evacuation with shelter in place for the 20-30 km zone.
- ◆ On a trial basis, synthetic resin was sprayed to prevent the spread of radioactive dust near the common spent fuel pool.
- ◆ TEPCO continues to address issues with water in trenches outside turbine buildings of Units 1, 2 and 3
  - A 20 cm crack was found in a pit connected to the Unit 2 turbine building and is leaking radioactive water into the ocean with rad levels exceeding 1000 mSv/hr. TEPCO attempted to use polymeric and other materials on April 3 to seal the leak, but was unsuccessful. TEPCO is currently injecting white dye to trace the path of radioactive water from points of origin through the complex and into the ocean
  - TEPCO constructing a water treatment facility to reduce activity in water discharged to the sea and considering using a large floating platform to store up to 10,000 tons of radioactive water.
- ◆ Large Putzmeister concrete pump being flown to JPN
- ◆ Water Storage and Disposal
  - At 1900 JST of April 4, TEPCO began discharging to the sea the low radioactive waste water stored in the Central Radioactive Waste Disposal Facility and the low level radioactive subsurface water stored in the sub drain pits
  - GOJ requested on behalf of TEPCO 5 Savannah River Site storage tanks and high activity trailer
  - GOJ requested Russia to send ship "Suzuran" used to decommission nuclear submarines to treat and store radioactive water



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# DOE/NNSA Emergency Response

- ◆ **Command, Control, Coordination:**
  - **Nuclear Incident Team (NIT):** Coordinating overall emergency response
  - **Policy Working Group (PWG):** Coordinating overall policy
  - **Senior Energy Official:** Primary Manager of deployed field teams
  - **Liaisons:** DART, USPACOM, USAID, NRC
- ◆ **Modeling**
  - **National Atmospheric Release Advisory Center (NARAC):** conducting predictive radioactive atmospheric dispersion modeling
- ◆ **Monitoring and Sampling**
  - **Consequence Management Response Team (CMRT):** Conducting ground monitoring, air sampling and initial results analysis
  - **Aerial Measuring System (AMS):** Conducts aerial detection for mapping radiological ground material deposits
  - Currently 3 platforms: 1 Fixed, 2 Rotary
- ◆ **Assessment**
  - **Consequence Management Home Team (CMHT):** Scientific assessment of data updated daily from ground measurements and AMS flights
- ◆ **Medical Consultation**
  - **Radiation Emergency Assistance Center/Training Site (REAC/TS):** Providing medical advice about radiological exposure

## Deployed\* (39)

### Yokota AB

- (2) SEO
- (1) SEO Staff
- (24) CMRT
- (7) AMS

### US Embassy Tokyo

- (4) DART LNO

### USPACOM HQ

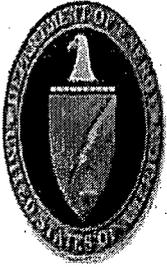
- (1) LNO

### Upcoming personnel changes:

Several personnel enroute to/from Japan 3-6 April.

\*The number deployed does not currently reflect DOE/NNSA personnel assisting in nuclear energy (NE) aspects of the response.

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# Significant Events: Past 24 Hrs.

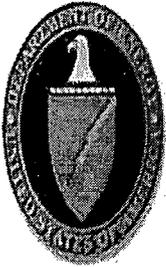
## International Engagement:

- ◆ GOJ to issue a press release regarding planned bilateral aerial monitoring activities on or about 5 April
- ◆ US Embassy met with MOFA and MEXT to request approval for placing early warning sensors at specific locations
- ◆ 2 High Purity Germanium (HPGe) detectors being shipped to GOJ to support sample analysis
- ◆ JPN shipping approximately 90 soil samples (on Thurs) to Savannah River Site for lab analysis
- ◆ MG Bansho, JSDF received briefing and tour from CMRT

## Nuclear Incident Team:

- ◆ Provided ground monitoring and aerial measuring data spreadsheets to CDC, FDA, HHS, USDA, EPA, NRC, DHS, NR, DIA and WH
- ◆ Continued Coordination of rotation for deployed personnel

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# Significant Events: Past 24 Hrs.

## Operations:

### ◆ Modeling

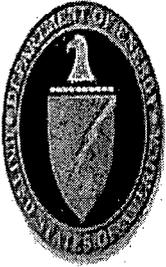
- NARAC: Continued work on products normalizing NARAC models to measurements taken in the field. Preliminary assessment of time correlated deposition and further assessment of dose rate measurements correlated to actual weather patterns

### ◆ Field Monitoring and Assessment

- AMS UH-1 (1): Survey along eastern flanks of mountains on west side of Tohuka Expressway north to Koriyama to north side of Fukushima
- AMS UH-1 (2): No mission today
- AMS C-12: Survey N and NE of Fukushima Daiichi plant near shoreline primarily over water
- Ground teams: Completed beta/gamma exposure rate surveys. Radio nuclide evaluations are to include in-situ measurement assessment of gamma isotopes. Continued monitoring activities at US Embassy Japan and Embassy Resident Towers in Tokyo, CMOC TOC at Yokota AB, and Yokuska Naval Base

### ◆ Medical Consult

- Nothing substantial to report



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# Data Inputs

(as of 6 Apr)

## ♦ Monitoring

- Approx 232 hours total Aerial Measurement System (AMS) fixed and rotary-wing flights
- Approx 100,000 total Field Measurements taken by DOE, DoD, and GOJ fixed stations and deployed teams

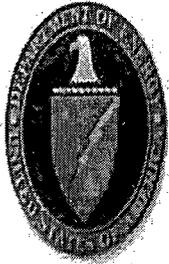
## ♦ Sampling

- 240 total Air Samples taken at US facilities throughout JPN undergoing lab analysis in US
- 1 US soil sample at LLNL for lab analysis

### Organizations Providing Data

- **Consequence Management Response Team**
  - CMRT/CMOC
  - AMS
  - AFRAT
- **External US**
  - Japan Emergency Command Center, US Embassy, Tokyo
  - USAF, BSC Commander
  - USAF, WC-135 Constant Phoenix
  - Futenma Marine Corps Air Station
  - Nuclear Regulatory Commission
  - Naval Reactors
- **Japan**
  - Ministry of Foreign Affairs (MOFA)
  - Nuclear Safety Technology Center (NUSTEC)
  - Tokyo Electric Power Company (TEPCO)
  - Ministry of Agriculture, Forestry and Fisheries (MAFF)
  - Ministry of Education, Culture, Sports, Science, and Technology (MEXT)
  - Ministry of Health, Welfare and Labor
  - Nuclear and Industrial Safety Agency (NISA)
  - Nuclear Safety Commission

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# Guide to Interpretation

## US EPA Derived Response Levels (DRLs) for Evacuation and Relocation

### ■ Early Phase DRL

If a person is in danger of receiving an external radiation dose of 1 Rem over 4 days, the EPA recommends evacuation until radiation levels decrease. This area is indicated by red.

### ■ First Year DRL

If a person is in danger of receiving an external radiation dose greater than 2 Rem during the first year, the EPA recommends relocation until radiation levels decrease. This is not an urgent action because the dose is received over a full year. This area is indicated by orange.

### ■ Fifty Year DRL

If a person is in danger of receiving an external radiation dose greater than 5 Rem over 50 years, the EPA recommends relocation until radiation levels decrease. This is not an urgent action because the dose is received over fifty years. This area falls within the second year DRL.

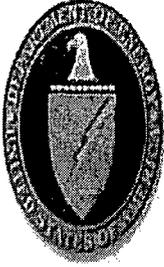
### ■ Second Year DRL

If a person is in danger of receiving an external radiation dose of greater than 0.5 Rem in the second year (or any subsequent year), the EPA recommends relocation until radiation levels decrease. This area is indicated by yellow.

These calculations account for multiple variables. For instance, radiation is most intense in the first days following its release therefore dose reduction may be met by evacuating early in the response.

Protective actions are frequently expressed in dose rates. The dose rate is an indicator that residents would accumulate the threshold dose if they stayed in the area the entire time expressed (e.g. 1 year, 2 years, 50 years).

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# Guide to Interpretation

## Areas at Risk for Agricultural Contamination

Aerial measurements can indicate areas where agricultural monitoring and sampling should occur, although they cannot directly determine the amount of contamination of agricultural products grown in these areas.

AMS monitoring results in areas beyond 25 miles from the Fukushima Daiichi reactors show areas where dose rates are many times higher than historical background.

The measured external dose rates in these areas are not high enough to warrant evacuation or relocation of the population, however, lower levels of radioactive contamination in agricultural products provide more of a risk because the radioactive material can be ingested into the body. Agricultural monitoring in these areas may be warranted.

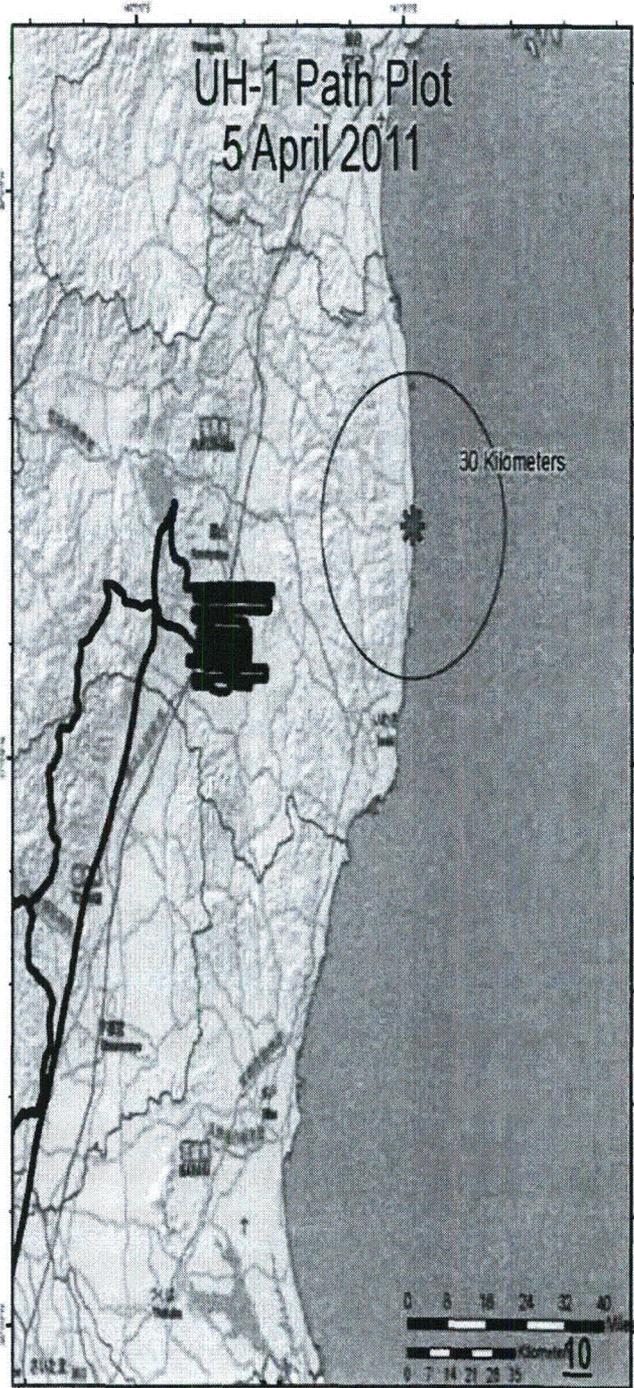
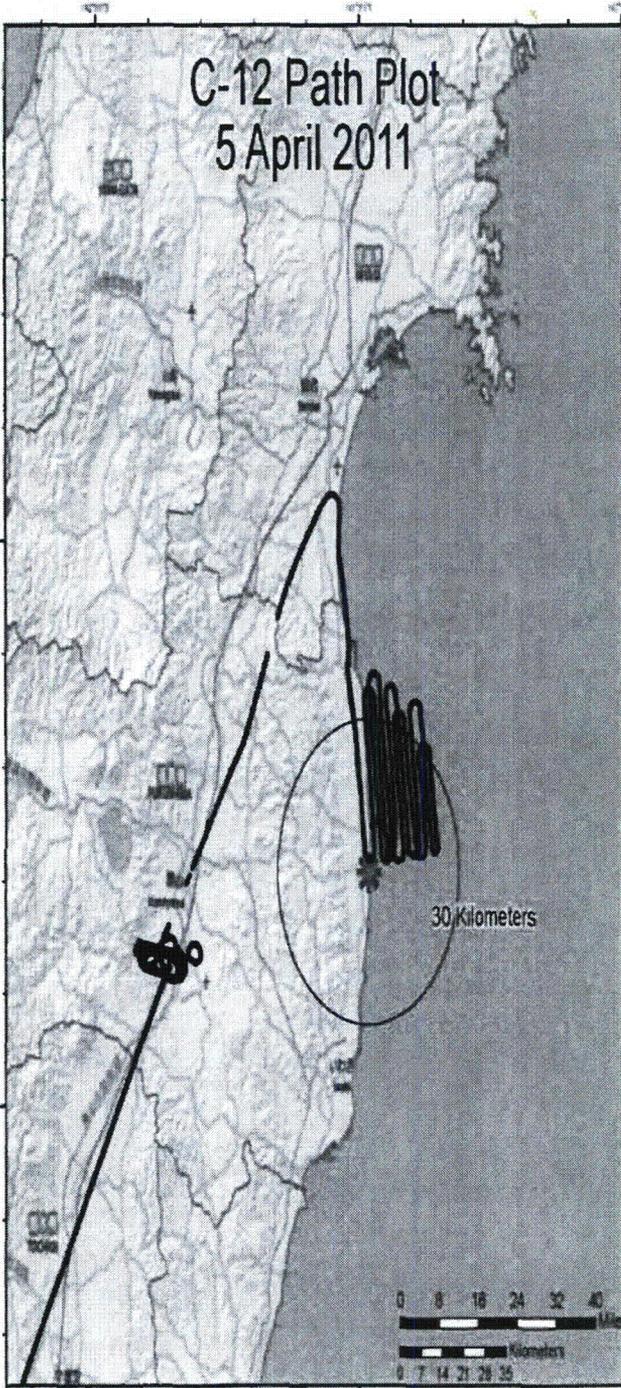
- ◆ Areas 10 to 100 times historical background are indicated by green.
- ◆ Areas 2 to 10 times historical background are indicated by light blue.
- ◆ Areas at or near historical background are indicated by dark blue.

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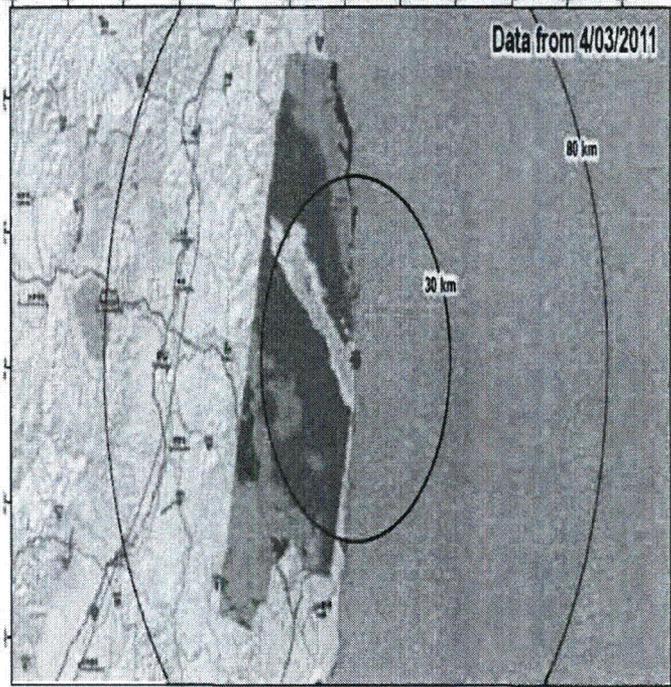
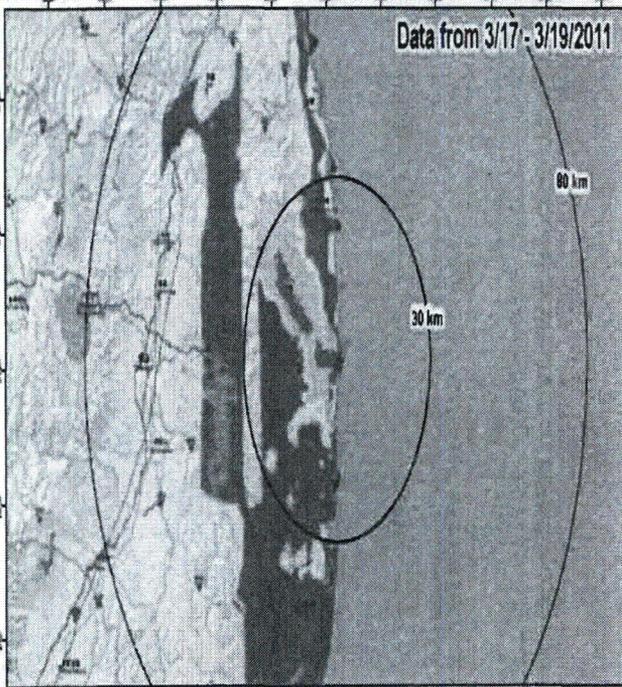
# Flight Path Map



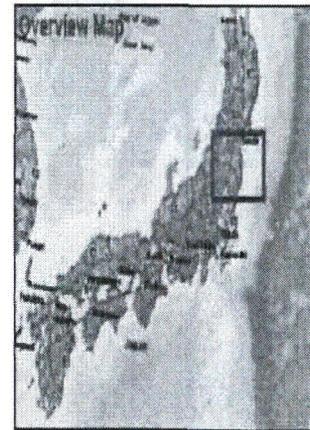
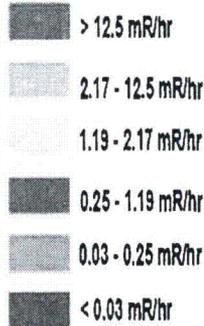
# Aerial Monitoring Survey Areas

## Overview Aerial Monitoring Contoured Results 03/17 - 04/03/2011

FUKUSHIMA DAIICHI  
JAPAN



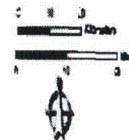
Aerial Data (3/17 - 4/03/2011)  
Exposure Rate at 1 meter (mR/hr)



Not For Public Distribution

This map was produced by the Geographic Information Systems department of NNSA's Remote Sensing Laboratory (RSL) at Nellis AFB, Las Vegas, Nevada. HSP Gold 2010, ESRI World Street Map, and CMHT databases were used for map generation.

RSL map identification number is:  
AMS ComparisonResultsContoured 04042011.mxd



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Nuclear Incident Team, DOE-NIT

Contact

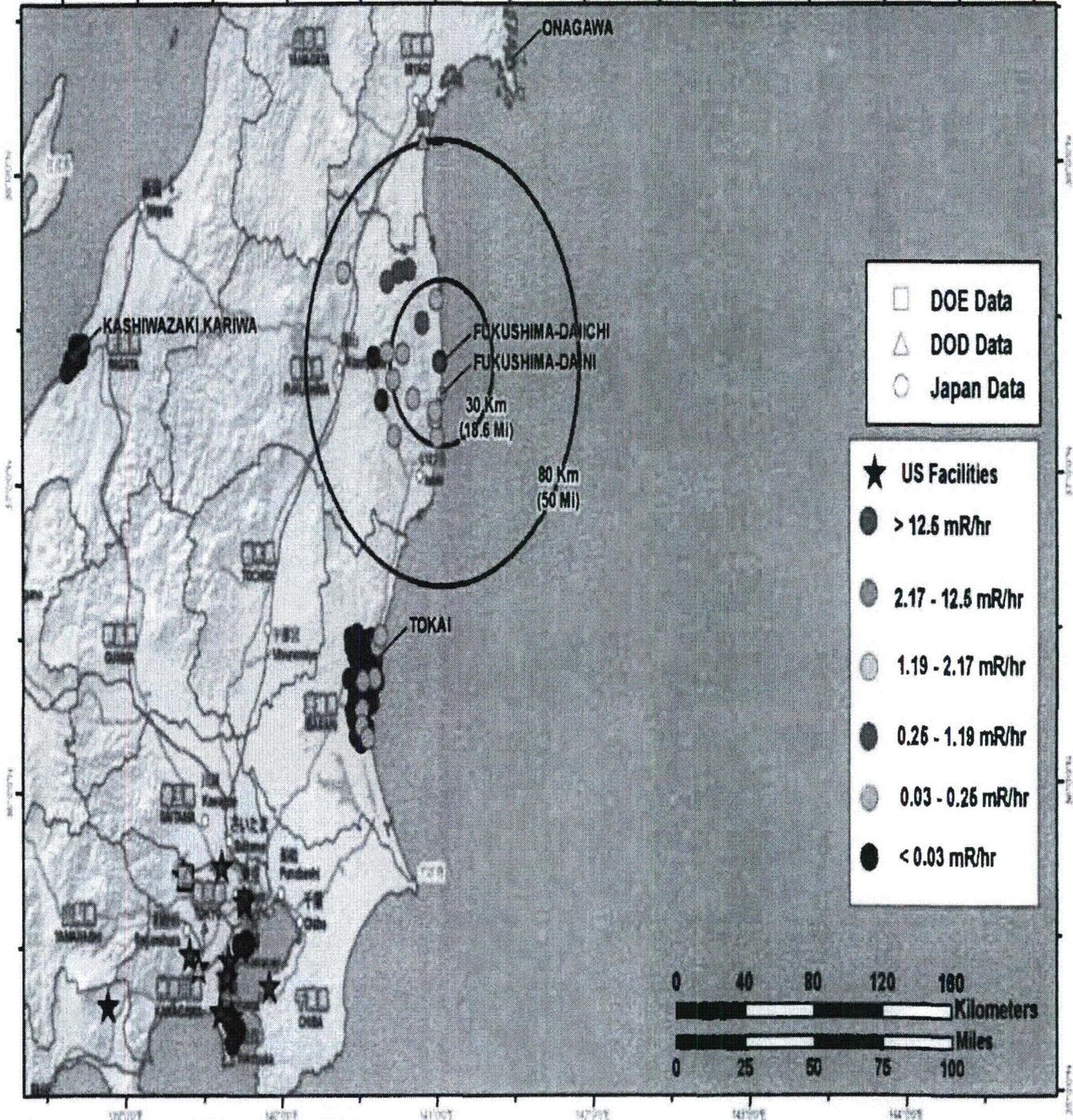
(b)(6)



# Field Monitoring Results

April 4 13:00 to April 5 13:00 JST

## FUKUSHIMA DAIICHI JAPAN



Map created on 04052011 1400 JST

Name: NIT 24hrsMonitoringResults 04Apr2011 1300

UNCLASSIFIED

Nuclear Incident Team DOE NIT

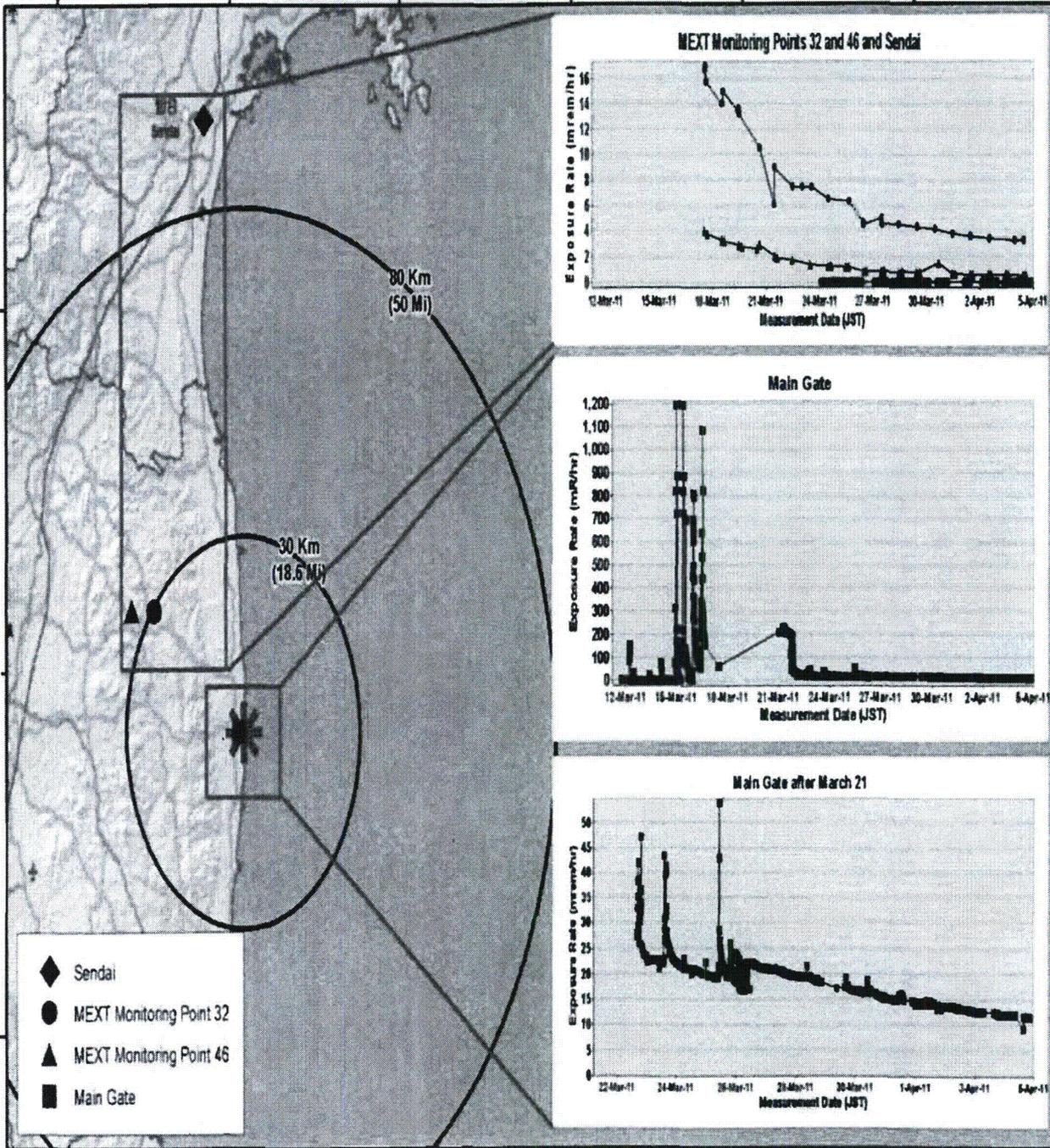
Contact

(b)(6)



# Exposure Rate Trends Extending Northwest

FUKUSHIMA DAIICHI  
JAPAN



Map created on 04042011 1930 JST  
Name: NIT MonTrend 04Apr2011 w/PAGs North

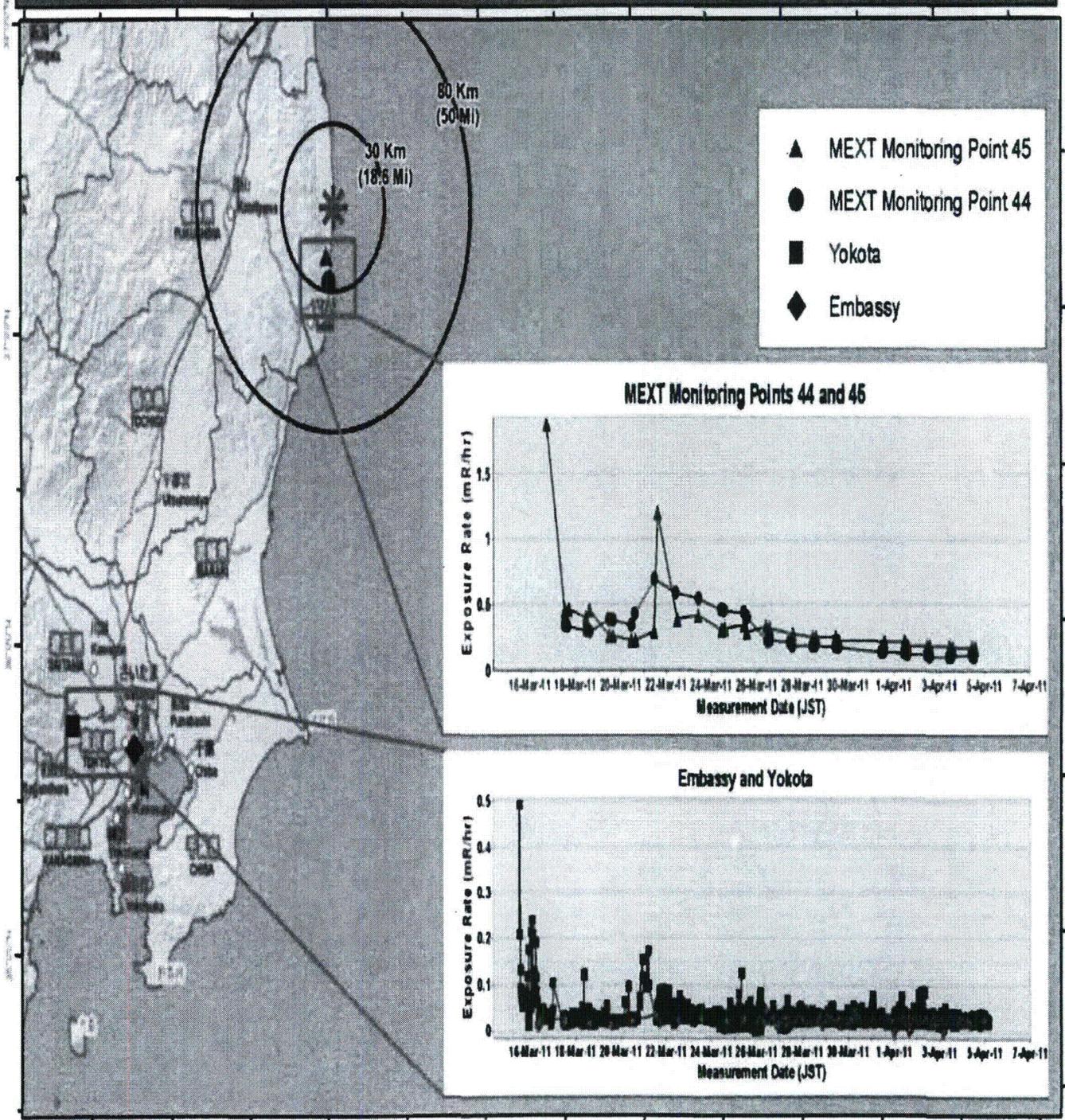
UNCLASSIFIED

Nuclear Incident Team DOE NIT  
Contact (b)(6)



# Exposure Rate Trends Extending South to Yokota AB

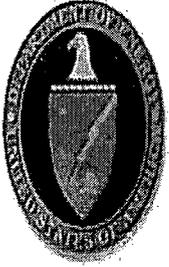
FUKUSHIMA DAIICHI  
JAPAN



Map created on 04052011 2000 JST  
Name: NIT MonTrend 04Apr2011 wPAG's South

UNCLASSIFIED

Nuclear Incident Team DOE NIT  
Contact (b)(6)



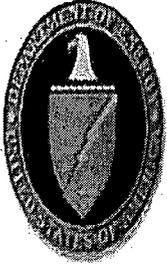
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# Aerial and Ground Monitoring Data Assessment

- ◆ An assessment of measurements gathered through 4 April continues to show:
  - Radiation levels consistently below actionable levels for evacuation or relocation outside of 25 miles
  - Radiological material has not deposited in significant quantities since 19 March
  
- ◆ An assessment of measurements gathered at US military installations in the Tokyo area through 4 April shows:
  - Radiation levels far below actionable levels for evacuation or relocation
  - All aerial measurements at US facilities were less than 32  $\mu\text{R/hr}$  - a level that poses no known health risk
  - Monitoring of these locations will continue although no increases in deposited radiation are anticipated

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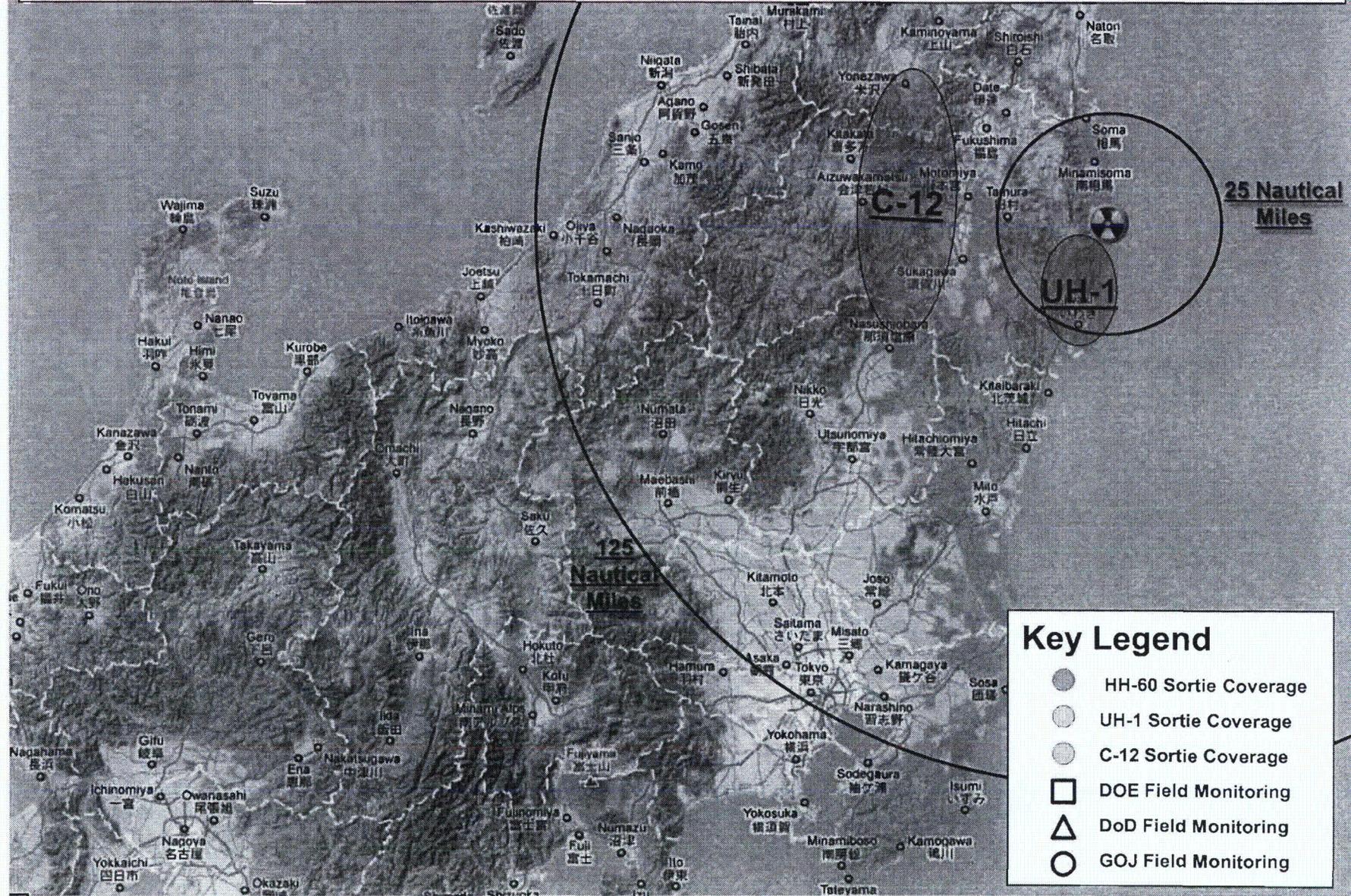
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# Planned Operations: Next 24 Hrs

- ◆ Aerial Monitoring
  - AMS UH-1: Fly from Fukushima Daiichi plant south to 30 km line along coast
  - AMS C-12: Fly west of Fukushima Daiichi plant between 40-60 km
  - Flights are being coordinated with GOJ MEXT
    - All areas inside of 80 km from plant will be surveyed in period 6-12 April
    - AMS will fly inside 60 km line; MEXT will fly outside 60 km line
- ◆ Ground Monitoring
  - Complete beta/gamma exposure rate surveys. Radio nuclide evaluations are to include in-situ measurement assessment of gamma isotopes.
  - Continue monitoring activities at the US Embassy Japan and the Embassy Resident Towers in Tokyo, CMOC TOC at Yokota AB, and Yokuska Naval Base.
  - Continuing work to implement the Early Warning Array utilizing Infields and SMC.
- ◆ Ambassador Roos visiting Yokota and will meet with CMRT

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# Planned Aerial/Field Monitoring Operations April 6, 2011 Operational Period



**DEPARTMENT OF ENERGY SITUATION REPORT**  
**Earthquake & Tsunami in Japan**

5 April 2011  
01800 (EDT) UPDATE

*Note: Beginning with the 1800 March 31 SITREP, each entry is labeled with the time and date of the latest SITREP that updated the information. Paragraphs with no indicated time were prepared prior to the 1800 March 31 SITREP and were included as the latest information available. Less frequent information updates are available from Japanese agencies. (0600, 4/2 SITREP)*

(NOTE: JST = EDT + 13 hours; EDT = GMT/UTC - 4 hours).

**POWER PLANT UPDATE AND OTHER NUCLEAR ISSUES**

Per TEPCO, there is currently a large amount of radioactive waste water in the turbine buildings of the Fukushima Daiichi reactors (the turbine building of Unit 2 has extremely high level radioactive waste water). In accordance with GoJ regulations, TEPCO has decided to discharge to the sea approximately 10,000 tons of the accumulated low level radioactive water and a total of 1,500 tons of the low level radioactive subsurface water stored in the sub drain pits of Unit 5 and 6. Per TEPCO's evaluation, the impact on the discharge of the low radioactive waste water to the sea if a person eats adjacent fish and seaweeds every day, that person will receive approximately 0.6 mSv of effective radioactive doses per year for adults (equal to one-fourth of the annual radioactive dose to which the general public is exposed in nature). At 1900 JST of April 4, TEPCO began discharging to the sea the low radioactive waste water stored in the Central Radioactive Waste Disposal Facility and the low level radioactive subsurface water stored in the sub drain pits. By noon Tuesday [2300 EDT 4/4], an estimated 3,430 tons of low level radioactive water was discharged into the Pacific Ocean. (0600, 4/5 SITREP)

According to NHK reporting, Tokyo Electric Power Company started infusing liquid glass into gravel below the pit near the Number 2 reactor at 3 PM JST on Tuesday. TEPCO spotted a crack in the pit 3 days ago while trying to find the source of the leakage of contaminated water into the Pacific Ocean. Since then, the utility has tried to seal the pit with concrete, or to plug piping leading into it with a polymer mixture. A test using a dye agent showed the possibility that the radioactive water is leaking from a cracked pipe, and then seeping through gravel into the concrete pit.

TEPCO is planning to board up the breached sections of an offshore dike to prevent the tainted water from spreading further into the sea. It is also considering building underwater silt barriers at 3 locations, including one near a water intake for the Number 2 reactor. Tuesday, April 05, 2011 18:57 (JST)

Per Reuters, Japan has asked Russia to send the "Suzuran," a special radiation treatment ship used to decommission nuclear submarines by which treating radioactive liquids,

Japanese media said. The ship, a joint venture between Japan and Russia, was designed to help decommission nuclear submarines in Russia's Pacific fleet in Vladivostok, ensuring radioactive waste was not dumped into the Sea of Japan. (0600, 4/5 SITREP)

**Update on Reactor Containment Vessels:**

According to the NRC's 4/4 1800 EDT Status Update, damage is suspected in the primary containment vessel of Unit 1 and there is a slow leakage. (0600, 4/5 SITREP)

**Updates on Cooling Efforts and Cooling Water Management:**

Per the IAEA, as of 21:15 JST April 4, fresh water continues to be injected into the Unit 1 reactor pressure vessel through the feed-water line (NRC says fire extinguisher line citing TEPCO) using a pump powered with offsite electric power. Per the IAEA, as of 21:15 JST April 4, fresh water continues to be injected into the Units 2 and 3 reactor pressure vessels through the fire extinguisher line using a pump powered with offsite electric power. (1800, 4/4 SITREP)

**Radiation Detection Updates:**

Per the Nuclear Energy Institute, radiation dose rates at the Daiichi site continue to fall. Recent readings showed 12.4 millirem per hour at the main gate, 7.4 millirem per hour at the west gate and 78 millirem per hour on the side of the administration building facing the reactors. (1800, 4/4 SITREP)

Per JAIF as of 1500 JST on April 5, Radiation levels were 0.72mSv/h at the south side of the office building, 112 µSv/h at the Main gate and 49 µSv/h at the West gate.

**(Official Use Only) Field Measurements Update (Updated each SITREP):**

Recent events of past 24 hours:

- Field Monitoring and Assessment
  - AMS UH-1 (1): Survey along eastern flanks of mountains on west side of Tohuka Expressway north to Koriyama to north side of Fukushima
  - AMS UH-1 (2): No mission today
  - AMS C-12: Survey N and NE of Fukushima Daiichi plant near shoreline primarily over water
  - Ground teams: Completed beta/gamma exposure rate surveys. Radionuclide evaluations are to include in-situ measurement assessment of gamma isotopes. Continued monitoring activities at US Embassy Japan and Embassy Resident Towers in Tokyo, CMOC TOC at Yokota AB, and Yokosuka Naval Base

Planned operations over the next 24 hours:

- Aerial Monitoring
  - AMS UH-1: Fly from Fukushima Daiichi plant south to 30 km line along coast
  - AMS C-12: Fly west of Fukushima Daiichi plant between 40-60 km
  - Flights are being coordinated with GOJ MEXT
    - All areas inside of 80 km from plant will be surveyed in period 6-12 April
    - AMS will fly inside 60 km line; MEXT will fly outside 60 km line
- Ground Monitoring
  - Complete beta/gamma exposure rate surveys. Radionuclide evaluations are to include in-situ measurement assessment of gamma isotopes.
  - Continue monitoring activities at the US Embassy Japan and the Embassy Resident Towers in Tokyo, Yokota AB, and Yokosuka Naval Base.
  - Continuing work to implement the Early Warning Array
- ~~Ambassador Roos visiting Yokota and will meet with CMRT~~

**Updates by Reactor Unit** (Updated each SITREP)

~~No reactor parameter value updates were available as of 1800 EDT on April 5.~~

**Fukushima Dai-ichi Unit 1 reactor (NRC priority 1):**

Per the IAEA, as of 1715 UTC April 3, fresh water continues to be injected into the reactor pressure vessel through the feed-water line at an indicated flow rate of 6 m<sup>3</sup>/h using a pump powered with offsite electric power (See above)

Per JAIF at 0600 JST 5 April, reactor parameters are: RPV pressure (A) 0.308 MPa Gauge (G), (B) 0.619 MPa G; water level 1.70/1.65 meters below the top of the fuel rods; containment vessel pressure 0.150 MPa absolute (abs); RPV feedwater nozzle 233.5 °C; SFP thermography 18 °C at 0720 4 April

Per NISA, a test water spray over the SFP using concrete pump truck was carried out on 2 April to confirm the appropriate position for water spray (1800, 4/4 SITREP).  
As of April 1, 1100 JST water level in trench is 1.14m below floor level.  
As of March 24, the NRC estimated that Unit 1 had 70% core damage.  
The reactor vessel and primary containment are intact.  
Unit #1 contains 292 elements.

**Fukushima Dai-ichi Unit 2 reactor (NRC priority 2):**

Per the IAEA, as of 21:15 JST April 4, fresh water continues to be injected into the reactor pressure vessel through the fire extinguisher line at an indicated flow rate of 8 m<sup>3</sup>/h using a pump powered with offsite electric power. (1800, 4/4 SITREP)

Per JAIF 0600 JST 5 April, RPV pressure (A) -0.018 MPa G, (B) -0.018 MPa G; water level 1.50 meters below the top of the fuel rods; containment vessel pressure 0.100 MPa abs, the indicated temperature at the feed water nozzle of the RPV is 138.9 °C and bottom head is not reported; SFP temperature is 48°C.

As of April 1, 1100 JST, water level in the trench is 1.04 meters below floor level.  
On March 24, the NRC estimated that Unit 2 had 33% core damage.

Unit#2 SFP contains 587 elements.

**Fukushima Dai-ichi Unit 3 (NRC priority 3):**

Per the IAEA, as of 2115 JST April 4, fresh water continues to be injected into the reactor pressure vessel through the fire extinguisher line at an indicated flow rate of 7 m<sup>3</sup>/h using a pump powered with offsite electric power.

Per JAIF 0540 JST 5 April, RPV pressure (A) 0.011 MPa G, (B) -0.081 MPa G; containment vessel pressure 0.1078 MPa absolute (abs); water level 1.85 meters below the top of the fuel rods; containment vessel pressure 0.1078 MPa abs  
Per IAEA at 2115 JST on April 3, the indicated temperature at the feed water nozzle of the RPV is about 114 °C (validity still under investigation) and at the bottom of RPV is about 90 °C.

As of April 1, 1100 JST, water level in trench is 1.55m below floor level.  
Fresh water injection to the unit 3 Spent Fuel Pool via the Cooling and Purification Line continues. SFP thermography 56 °C as of 0750 April 3 (1800, 4/4 SITREP).  
On March 24, the NRC estimated that Unit 3 had 33% core damage.  
Unit #3 SFP contains 514 elements.

**Fukushima Dai-ichi Unit 4 reactor (NRC priority 4):**

Unit 4 is shutdown with the core removed to the spent fuel pool in December for maintenance on the reactor.

Per JAIF, the SFP thermography was 30 °C at 0720 April 4.

~~Per TEPCO water spray by the concrete pump truck to Unit 4 was conducted from 1735 to 1822 on April 5th.~~

Unit #4 SFP contains 1331 elements.

**Fukushima Dai-ichi Unit 5 reactor (NRC priority 5):**

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

Per NISA as of NISA March 30: Reactor pressure 0.108 MPa abs, reactor water level 2.161 m above the top of the fuel rods, reactor water temperature is 29.9°C .

Per JAIF, as of 0700 JST 4 April, the SFP water temp was 35.5°C. Unit #5 SFP contains 946 elements.

**Fukushima Dai-ichi Unit 6 reactor (NRC priority 6):**

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

Per NISA as of 06:00 March 31: Reactor pressure 0.104 MPa, Reactor water temp 32.6°C, reactor water level 1.703 m above the top of the fuel rods.

Per JAIF, as of 0700 JST 5 April, SFP water temp was 28.5°C. Unit #6 SFP contains 876 elements.

**Fukushima Daiichi Common Spent Fuel Pool**

At 1000 on 18 March, it was confirmed that water level in the pool was secured. Japanese authorities have confirmed that fuel assemblies there are fully covered by water.

The IAEA reported on April 4, 2011, that the Common Spent Fuel Pool temperature was 32 °C at 23:10 UTC on 2 April.

**Other Information**

**UPDATE ON USG COORDINATION**

According to communications from the NSS, Richard Reed and AMB Jeff Bader will host an Assistant Secretary-level interagency policy committee (IPC) meeting on the ongoing situation in Japan via SVTC tomorrow, April 6, from 3:45-5:00pm. The objective of the IPC is to review taskings from Friday's PC and yesterday's DC, and to map the way ahead. Agencies should be prepared to report the status of progress on previous DC taskings. (1800, 4/5 SITREP)

USG and GOJ interagency crisis management teams met at 1900 on April 4, led on the U.S. side by the DCM, NRC team lead Chuck Casto, RADM Thomas Rowden, and USFJ Deputy Commander BG Blake Crowe. The Japanese side was led by Diet Member and Special Advisor to the Prime Minister Goshi Hosono who chaired for the Japanese side, along with Deputy Chief Cabinet Secretary Tetsuro Fukuyama. The Japanese side included senior Cabinet Secretariat officials and representatives of MOD, MOFA, METI, MEXT, MLIT, MHLW, NSC, NISA, and TEPCO. The Japanese side reported on progress to date by project teams on reactor confinement, spent fuel transfer and remote control equipment. The GOJ also reported that three additional project teams are already working at TEPCO on construction of a long-term, stable cooling system for the reactors; collection and recycling of radioactive waste water; and environmental impact of radioactivity. The U.S. side described a USG effort to harmonize and track requests and offers of assistance and provided a draft spread sheet and a one-page form proposed to be used for documenting future requests. The GOJ indicated it would review the information and prioritize its requests, while reiterating that the bilateral Crisis Management Team meeting should continue to serve as the central clearinghouse for GOJ requests. (0600, 4/5 SITREP)

According to NRC's April 4<sup>th</sup> 1800 EDT Status Update, it was discussed in the Agency Deputies meeting that DOE is the lead for interagency technical support to Japan. (0600, 4/5 SITREP)

According to NRC's April 4<sup>th</sup> 1800 EDT Status Update, a white paper is being developed for the return of U.S. citizens to the Tokyo area. The paper will be finalized by April 6<sup>th</sup>. (0600, 4/5 SITREP)

**UPDATE ON US ASSISTANCE (updated per 4/5 21:44 email from J. Tilden)**

No additional information on estimated arrival of Putzmeister concrete pump. (0600 4/5 SITREP)

DOE INL is providing one specially modified TALON robot, three radiation sensors, five radiation-hardened cameras, and one GammaCam, with appropriate instructions (video and written). The Talon robot and hardened radiation cameras have been to be shipped to Japan with arrival expected on Friday, April 8. Video of equipment operational details for all equipment was recorded and will be available tomorrow. (E-mail from J. Tilden)

Per TEPCO-NISA's request, DOE SRS is providing five stainless steel ~16,000 gallon storage tanks and one ~1000 gallon high activity trailer, all of which can support water characterization and process development efforts. Further, a specialized pump from Hanford was also offered. Transportation, likely commercial, for this equipment is being arranged with no arrival date yet established. (0600, 4/5 SITREP)

#### **ENERGY INFRASTRUCTURE:**

**ELECTRICITY:** As of April 4th 12:00 AM JST, Japan's Ministry of Economic, Trade, and Industry reports that of the households that can receive power, 170,000 households remain without electricity in Japan. These customers are all located in Tohoku Electric Power Company's service area. There are no rolling blackouts scheduled for today or tomorrow (April 5 & 6) in the Tokyo Electric Power Company's (TEPCO) service area. Moving forward, rotating blackouts may still be implemented for select areas in TEPCO's service areas.

**PETROLEUM:** According to a report yesterday (April) from Japan's Ministry of Economic, Trade, and Industry, three oil refineries' operations remain suspended. Those refineries are the JX Sendai (145,000 b/d), JX Kashima (189,000 b/d), and Cosmo Chiba (220,000 b/d). Since the earthquake three refineries have restarted operations, the Kyokutou (175,000 b/d), TonenGeneral Kawasaki (335,000 b/d), and JX Negishi (270,000 b/d).

#### **CONTACTS WITH GOJ OFFICIALS:**

As per US Embassy reporting, at a coordination meeting led by the PM's Special Advisor Hosono, the Japanese side raised the issue of reimbursement for our nuclear-related assistance. According to Mitsugu Saito of the cabinet secretariat, the GOJ is hoping to receive a list of our reimbursement requests as soon as possible. The first supplementary budget request will go to the Diet within a month. There may be only one or two weeks to incorporate final proposals once the decision is made to submit the budget request. This is not necessarily the last chance to get our reimbursement requests into the budget, since another supplementary budget proposal is likely to follow in the future. Saito said the decision was made only yesterday afternoon to designate METI as the overall coordinator for the budget aspects of the assistance the GOJ is receiving. No office in METI has been identified yet to have the lead. For now, the cabinet secretariat will be the Embassy's POC. (1800, 4/5 SITREP)

#### **Media Reports**

Japan set a legal limit Tuesday for the permitted level of radioactive iodine in seafood as safety concerns spread overseas in the wake of continuing leaks of contaminated water into the Pacific Ocean from the crippled Fukushima Daiichi nuclear power plant.

The limit of 2,000 becquerels per kilogram set by the Ministry of Health, Labor and Welfare for radioactive iodine in marine products such as fish and shellfish is the same as that already adopted for vegetables, Chief Cabinet Secretary Yukio Edano told a press conference. The imposition of the limit followed the detection by Japanese authorities of 4,080 becquerels per kilogram of radioactive iodine in young sand lance caught Friday off Kitaibaraki in Ibaraki Prefecture, which prompted the health ministry to consider setting a limit for fish and clams. Chief Cabinet Secretary Yukio Edano dismissed the need for an immediate ban on shipments of marine products from the affected areas, but he pledged to toughen inspections to ensure that contaminated products do not reach markets. The government will make further efforts to provide sufficient information to other countries through diplomatic channels regarding its efforts to contain the leak of radioactive substances from the plant, the top government spokesman added. (Kyodo News, April 5)

**“Removal of 60,000 tons of radioactive water eyed at Fukushima plant”** (Kyodo News, April 5)

A total of 60,000 tons of radioactive water is believed to be flooding the basement of reactor buildings and underground trenches connected to them at the crisis-hit Fukushima nuclear plant, the industry minister said Tuesday. TEPCO began dumping low-level radioactive water Monday as an emergency step to secure room for the storage of more highly contaminated water. TEPCO aims to dispose of a total of 11,500 tons of low-level tainted water by this weekend. By noon Tuesday, an estimated 3,430 tons of such low radioactive water had been discharged into the Pacific Ocean from the plant on the coast, TEPCO said.

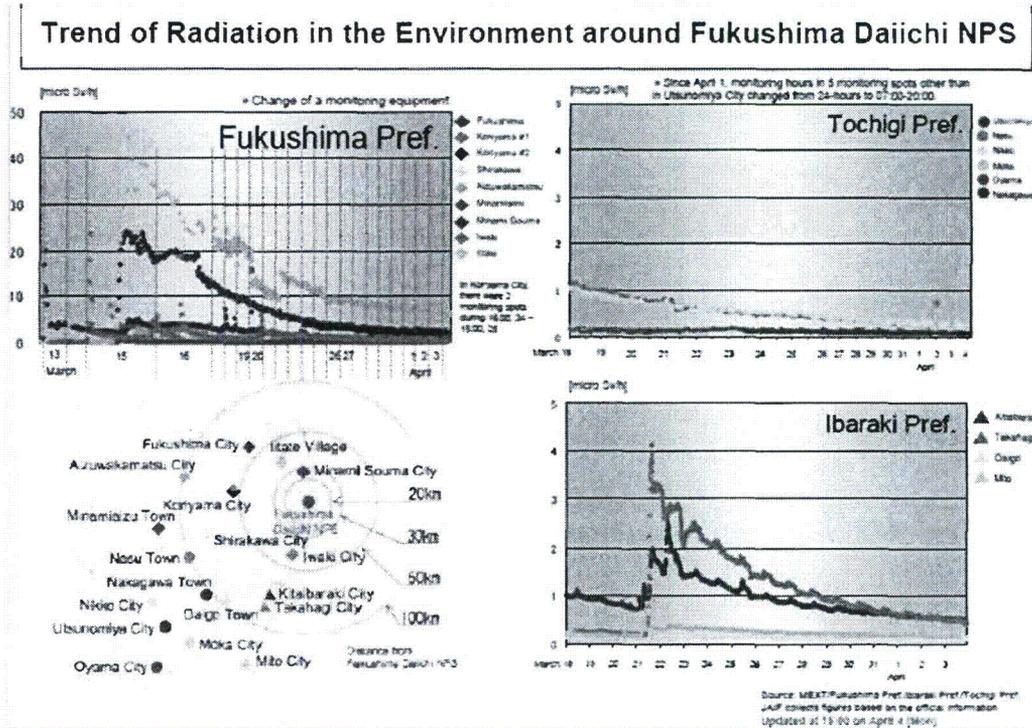
The Nuclear and Industrial Safety Agency said the 60,000 tons of water -- 20,000 tons each from the Nos. 1-3 reactor buildings and trenches -- will be stored in tanks at the units, a facility for nuclear waste disposal at the site, an artificial floating island called a "megafloat," U.S. Navy barges and provisional tanks. The provisional tanks will be shipped to the Fukushima plant by the end of this month, it added.

<http://english.kyodonews.jp/news/2011/04/83228.html>

Per the New York Times, TEPCO is rushing storage tanks to Fukushima to store the radioactive water, though the tanks may not arrive until mid-April, a company

spokesman said. TEPCO also plans to moor a giant artificial island off the coast to store contaminated water, though getting the island in place will take at least a week. (1800, 4/4 SITREP)

“Trend of Radiation in the Environment around Fukushima Daiichi NPS” (Graphic at Japan Atomic Industry Forum, April 5).



[http://www.jaif.or.jp/english/news\\_images/pdf/ENGNEWS01\\_1301966088P.pdf](http://www.jaif.or.jp/english/news_images/pdf/ENGNEWS01_1301966088P.pdf)

According to NHK reporting, the Japanese government has decided to suspend discussions on revising Japan's nuclear policy until the crisis at the Fukushima Daiichi power plant is over. The Cabinet Office's Atomic Energy Commission met on Tuesday for the first time since the March 11th earthquake and tsunami crippled the plant. The commission said it is taking the accident at the nuclear plant under the gravest consideration and that it has shaken the country's basic confidence in atomic power generation. Last year in December the commission launched discussions for revising the national outline on the use of nuclear energy. The current outline was formed in 2005. It covers basic policies on the use, research, development and promotion of nuclear power. The commission says it will decide its next step depending on developments at Fukushima and how the national debate on Japan's energy policy evolves. The commission chief, Shunsuke Kondo, said there is no denying that there are defects in Japan's nuclear safety standards. He added that the commission's existence itself could be

questioned in the future and ruled out any new moves by the regulatory body until the Fukushima crisis is resolved. Kondo suggested that the accident at the plant will have a major impact on the government's policy on the use of nuclear power in Japan. Tuesday, April 05, 2011 16:52 (JST)

According to NHK reporting, Radiation measurements have exceeded levels at which people are advised to stay indoors in a town outside the 30-kilometer radius of the damaged Fukushima Daiichi nuclear plant. The science ministry continues to monitor radiation levels in areas where residents have not been advised by the government to evacuate or stay indoors. The monitoring detected 10.3 millisieverts of radiation at one location in Namie Town, some 30 kilometers northwest of the plant. The amount is calculated on the assumption that a person has remained outdoors for 11 consecutive days through Sunday. The finding is higher than the 10 millisieverts the government views as the criteria for remaining indoors. The Nuclear and Industrial Safety Agency (NISA) says that as the radiation level was only detected in a limited area, it does not intend to expand the indoor advisory zone at present. Monday, April 04, 2011 21:21 (JST)

According to the Kyodo News Service, a plan to cover damaged reactor buildings at the crisis-hit Fukushima nuclear plant with special sheets to halt radiation leakage cannot offer a quick remedy, as the sheeting will be installed in September at the earliest due to high-level radioactivity hampering work at the site, government sources said Tuesday.

The government had asked Tokyo Electric Power Co., operator of the Fukushima Daiichi power station crippled by the March 11 quake and tsunami, to study the installment of radiation-shielding sheets, and a major construction firm commissioned to examine the idea said the construction will not start until June, the sources told Kyodo News.

They said workers need to wait until radiation levels drop at the site, where hydrogen explosions have blown away the roofs and upper walls of three reactor buildings.

At the gathering, a specialist from the U.S. Nuclear Regulatory Commission said the structure of the special sheets should guarantee that spent nuclear fuel pools in the reactor buildings will not be damaged even if the sheeting is toppled by quakes or typhoons, according to the sources.

Specialists in the government are planning to stem possible surges in radiation levels or further explosions in the reactor buildings to be wrapped by the sheets, by attaching materials that absorb radioactive materials to the inner side of the sheeting and installing air vents with filters to let out hydrogen, they said.

The costs of building framed structures around the Nos. 1-4 reactor buildings and wrapping them with the special sheets are estimated to reach 80 billion yen.

**CONTACT INFORMATION:  
Nuclear Incident Team in the Emergency Operations Center**

(b)(6)

**Office of the Deputy Secretary 202-586-5500**

**Watch Schedule April 5:**

Rhys Williams                      1600-2000/5 April  
Craig Welling

**Watch Schedule April 6:**

Chris Behan                        0400-0800  
Brian Robinson

James Conner                      1600-2000  
Carl Sink

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**From:** OST02 HOC  
**Sent:** Tuesday, April 05, 2011 6:51 PM  
**To:** LIA07 Hoc; Jones, Cynthia; Giitter, Joseph; RST01 Hoc; PMT01 Hoc; PMT02 Hoc; PMT11 Hoc; Hoc, PMT12  
**Subject:** FW: Japan Earthquake 5 April 2011 1800 EDT Situation Report  
**Attachments:** SITREP\_APR5 1800.docx; Japan\_Earthquake\_Response\_04052011\_1800.pdf

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

**From:** HOO Hoc [mailto:HOO.Hoc@nrc.gov]  
**Sent:** Tuesday, April 05, 2011 6:47 PM  
**To:** LIA07 Hoc; OST01 HOC; OST02 HOC; OST03 HOC  
**Subject:** FW: Japan Earthquake 5 April 2011 1800 EDT Situation Report

-----  
**From:** (b)(6)

**Sent:** Tuesday, April 05, 2011 6:45:47 PM

**To:** (b)(6) A-

(b)(6)

AR/15

(b)(6) Cc: [redacted] Adams, Ian; Adamson, Paul; Al Bouty; Alldridge, David; Allen, George; Aragon, Antonio; Black, Steven K. (IN) (IN); Calbos, Philip; Ciganer, Patrick; Connery, Joyce; Deeney, Chris; Durbin, Karyn; Elkind, Jonathan; FBI; Fremont, Douglas; Freshwater, David; Golub, Sal; Goodrum, Steve; Hanrahan, Robert; Harrington, Anne; Heinrich, Ann; Higgins, Paul (LAB) (IN); Huizenga, David; Jackson, Todd; Johnson, Shane; Kelly, John E (NE); Kreykes, Jon (IN); Krol, Joseph; LaVera, Damien; LeChien, Keith; Lee Harvis; Looney, Heather; Lyons, Peter; Miller, Neile; Miotla, Dennis; Mueller, Stephanie; Mustin, Tracy; NACCC; Niedzielski-Eichner, Phillip; O'Connor, Tom (NE-HQ); Owens, Missy; Pavetto, Carl; PRLH Navy; PWG; Rasar, Kimberly; Reynolds, Tom; Shrum, Scott; Smith-Kevern, Rebecca; Sunshine, Alexander; Thompson, Michael; Tilden, Jay; Underwood, Jefferson; USFJ; Visosky, Mark; White, William; Whitney, Mark; Willis, Sandra; Wright, Rasheem

Subject: Japan Earthquake 5 April 2011 1800 EDT Situation Report Auto forwarded by a Rule

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

This information is provided for your internal use and should be shared only with those who have a need to know.

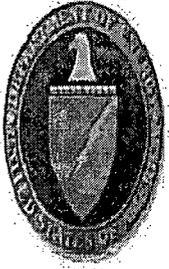
Nuclear Incident Team (NIT)

Office of Emergency Response (NA-42)

National Nuclear Security Administration U.S. Department of Energy

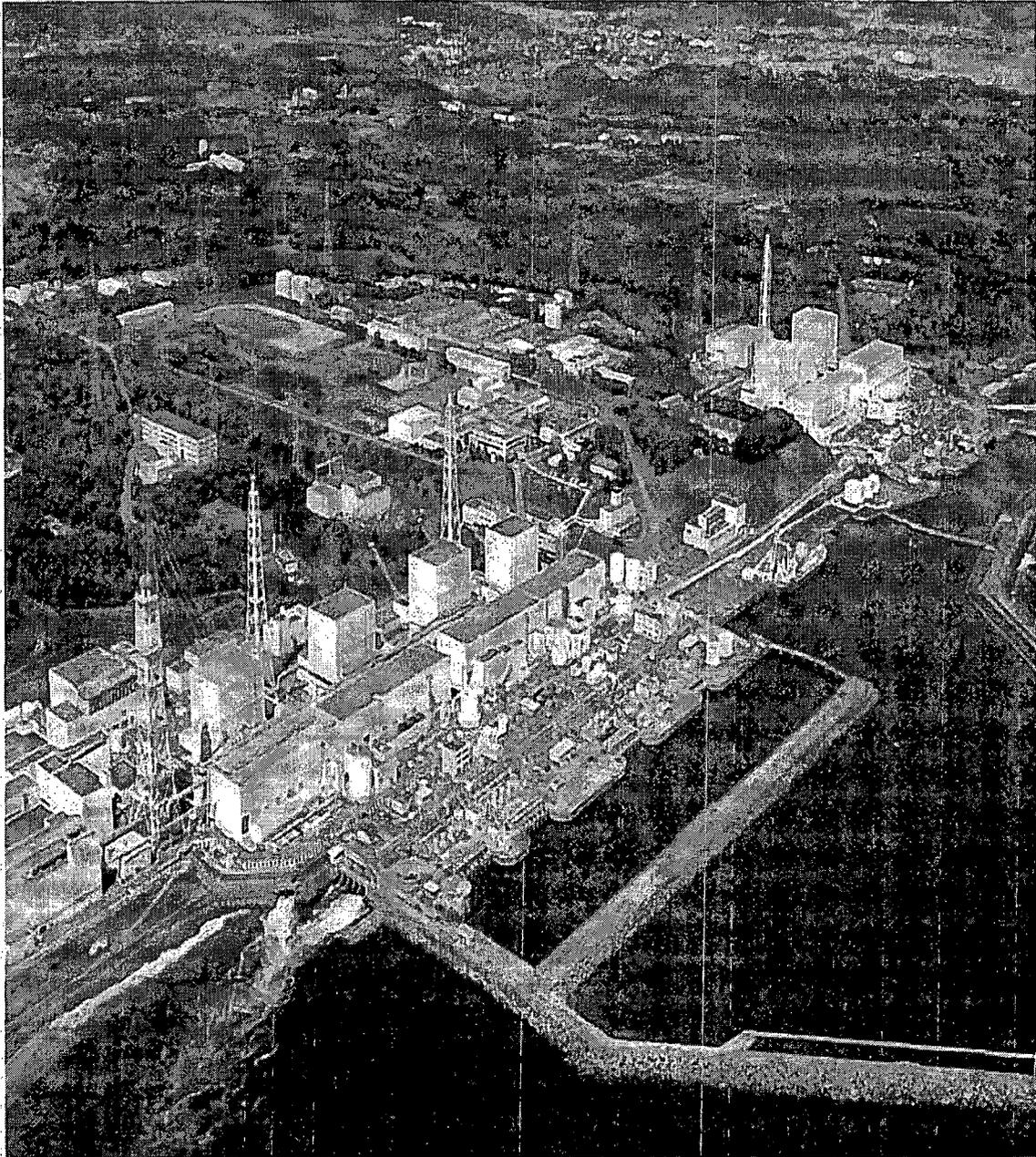
[redacted] (b)(6)

[redacted] (b)(6)



# Japan Earthquake Response

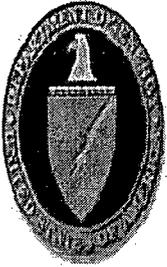
## April 5, 2011 // 1800EDT



Official Use Only

1

AR/116

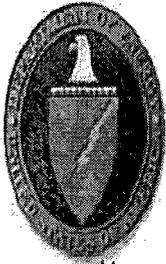


**This information is for limited  
distribution to those with a  
NEED TO KNOW  
and should not be forwarded outside  
your agency or organization without  
prior clearance from U.S. DOE**

**Contact: DOE/NNSA Nuclear Incident  
Team:**

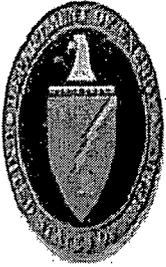
(b)(6)

~~Official Use Only~~



# Current Status

- ◆ No major changes in airborne radiation levels at the Fukushima Daiichi Power Plant
- ◆ Status of reactors 1-4 (water/pressure levels, status of water pumps, and electrical connectivity) provided in accompanying text SITREP
- ◆ The Japanese national government is now encouraging evacuation for local residents within the 20-30 km radius of the site boundary. This is a slight change from the previous voluntary evacuation with shelter in place for the 20-30 km zone.
- ◆ On a trial basis, synthetic resin was sprayed to prevent the spread of radioactive dust near the common spent fuel pool.
- ◆ TEPCO continues to address issues with water in trenches outside turbine buildings of Units 1, 2 and 3
  - A 20 cm crack was found in a pit connected to the Unit 2 turbine building and is leaking radioactive water into the ocean. TEPCO currently attempting to infuse liquid glass to seal the leak. A test using a dye agent showed the possibility that the radioactive water is leaking from a cracked pipe, and then seeping through gravel into the concrete pit.
  - TEPCO constructing a water treatment facility to reduce activity in water discharged to the sea and considering using a large floating platform to store up to 10,000 tons of radioactive water.
- ◆ Large Putzmeister concrete pump being flown to JPN
- ◆ Water Storage and Disposal
  - At 1900 JST of April 4, TEPCO began discharging to the sea the low radioactive waste water stored in the Central Radioactive Waste Disposal Facility and the low level radioactive subsurface water stored in the sub drain pits. By noon Tuesday, an estimated 3,430 tons of low level radioactive water was discharged into the Pacific Ocean.
  - GOJ requested on behalf of TEPCO 5 Savanna River Site storage tanks and high activity trailer
  - GOJ requested Russia to send ship "Suzuran" used to decommission nuclear submarines to treat and store radioactive water



# DOE/NNSA Emergency Response

## ◆ Command, Control, Coordination:

- **Nuclear Incident Team (NIT):** Coordinating overall emergency response
- **Policy Working Group (PWG):** Coordinating overall policy
- **Senior Energy Official:** Primary Manager of deployed field teams
- **Liaisons:** DART, USPACOM, USAID, NRC

## ◆ Modeling

- **National Atmospheric Release Advisory Center (NARAC):** conducting predictive radioactive atmospheric dispersion modeling

## ◆ Monitoring and Sampling

- **Consequence Management Response Team (CMRT):** Conducting ground monitoring, air sampling and initial results analysis
- **Aerial Measuring System (AMS):** Conducts aerial detection for mapping radiological ground material deposits
- Currently 3 platforms: 1 Fixed, 2 Rotary

## ◆ Assessment

- **Consequence Management Home Team (CMHT):** Scientific assessment of data updated daily from ground measurements and AMS flights

## ◆ Medical Consultation

- **Radiation Emergency Assistance Center/Training Site (REAC/TS):** Providing medical advice about radiological exposure

## Deployed\* (39)

### Yokota AB

- (2) SEO
- (1) SEO Staff
- (24) CMRT
- (7) AMS

### US Embassy Tokyo

- (4) DART LNO

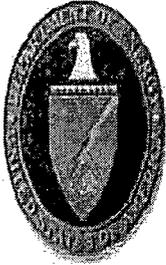
### USPACOM HQ

- (1) LNO

### Upcoming personnel changes:

Several personnel enroute to/from Japan 3-6 April.

*\*The number deployed does not currently reflect DOE/NNSA personnel assisting in nuclear energy (NE) aspects of the response.*



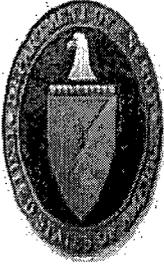
# Significant Events: Past 24 Hrs.

## International Engagement:

- ◆ US Embassy met with MOFA and MEXT to request approval for placing early warning sensors at specific locations
- ◆ 2 High Purity Germanium (HPGe) detectors being shipped to GOJ to support sample analysis
- ◆ Japan shipping more than 90 soil samples (on Friday) to Savannah River Site for lab analysis
- ◆ MG Bansho, JSDF received briefing and tour from CMRT

## Nuclear Incident Team:

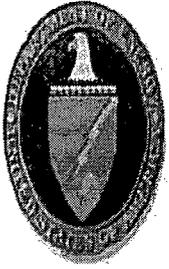
- ◆ Provided ground monitoring and aerial measuring data spreadsheets to CDC, FDA, HHS, USDA, EPA, NRC, DHS, NR, DIA, NCMI, and WH
- ◆ Continued coordination of rotation for deployed personnel



# Significant Events: Past 24 Hrs.

## Operations:

- ◆ Modeling
  - NARAC: Continued work on products normalizing NARAC models to measurements taken in the field. Preliminary assessment of time correlated deposition and further assessment of dose rate measurements correlated to actual weather patterns
- ◆ Field Monitoring and Assessment
  - AMS UH-1 (1): Survey along eastern flanks of mountains on west side of Tohuka Expressway north to Koriyama to north side of Fukushima
  - AMS UH-1 (2): No mission today
  - AMS C-12: Survey N and NE of Fukushima Daiichi plant near shoreline primarily over water
  - Ground teams: Completed beta/gamma exposure rate surveys. Radionuclide evaluations are to include in-situ measurement assessment of gamma isotopes. Continued monitoring activities at US Embassy Japan and Embassy Resident Towers in Tokyo, CMOC TOC at Yokota AB, and Yokosuka Naval Base
- ◆ Medical Consult
  - Nothing substantial to report



# Data Inputs

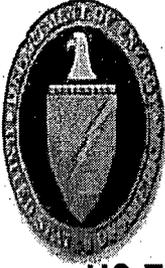
## ♦ Monitoring

- 232 hours total flying time for Aerial Measuring System (AMS) fixed and rotary-wings
- Approximately 100,000 total field measurements taken by DOE, DoD, and GOJ fixed stations and deployed teams

## ♦ Sampling

- 240 total air samples taken at US facilities throughout Japan undergoing lab analysis in US
- 1 US soil sample at LLNL for lab analysis

<u>Organizations Providing Data</u>	
♦	<b>Consequence Management Response Team</b>
•	CMRT
•	AMS
•	AFRAT
♦	<b>External US</b>
•	Japan Emergency Command Center, US Embassy, Tokyo
•	USAF, BSC Commander
•	USAF, WC-135 Constant Phoenix
•	Futenma Marine Corps Air Station
•	Nuclear Regulatory Commission
•	Naval Reactors
♦	<b>Japan</b>
•	Ministry of Foreign Affairs (MOFA)
•	Nuclear Safety Technology Center (NUSTEC)
•	Tokyo Electric Power Company (TEPCO)
•	Ministry of Agriculture, Forestry and Fisheries (MAFF)
•	Ministry of Education, Culture, Sports, Science, and Technology (MEXT)
•	Ministry of Health, Welfare and Labor
•	Nuclear and Industrial Safety Agency (NISA)
•	Nuclear Safety Commission



# Guide to Interpretation

## US EPA Derived Response Levels (DRLs) for Evacuation and Relocation

### ■ Early Phase DRL

If a person is in danger of receiving an external radiation dose of 1 Rem over 4 days, the EPA recommends evacuation until radiation levels decrease. This area is indicated by red.

### ■ First Year DRL

If a person is in danger of receiving an external radiation dose greater than 2 Rem during the first year, the EPA recommends relocation until radiation levels decrease. This is not an urgent action because the dose is received over a full year. This area is indicated by orange.

### ■ Fifty Year DRL

If a person is in danger of receiving an external radiation dose greater than 5 Rem over 50 years, the EPA recommends relocation until radiation levels decrease. This is not an urgent action because the dose is received over fifty years. This area falls within the second year DRL.

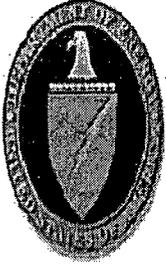
### ■ Second Year DRL

If a person is in danger of receiving an external radiation dose of greater than 0.5 Rem in the second year (or any subsequent year), the EPA recommends relocation until radiation levels decrease. This area is indicated by yellow.

These calculations account for multiple variables. For instance, radiation is most intense in the first days following its release therefore dose reduction may be met by evacuating early in the response.

Protective actions are frequently expressed in dose rates. The dose rate is an indicator that residents would accumulate the threshold dose if they stayed in the area the entire time expressed (e.g. 1 year, 2 years, 50 years).

Official Use Only



# Guide to Interpretation

## Areas at Risk for Agricultural Contamination

Aerial measurements can indicate areas where agricultural monitoring and sampling should occur, although they cannot directly determine the amount of contamination of agricultural products grown in these areas.

AMS monitoring results in areas beyond 25 miles from the Fukushima Daiichi reactors show areas where dose rates are many times higher than historical background.

The measured external dose rates in these areas are not high enough to warrant evacuation or relocation of the population, however, lower levels of radioactive contamination in agricultural products provide more of a risk because the radioactive material can be ingested into the body. Agricultural monitoring in these areas may be warranted.

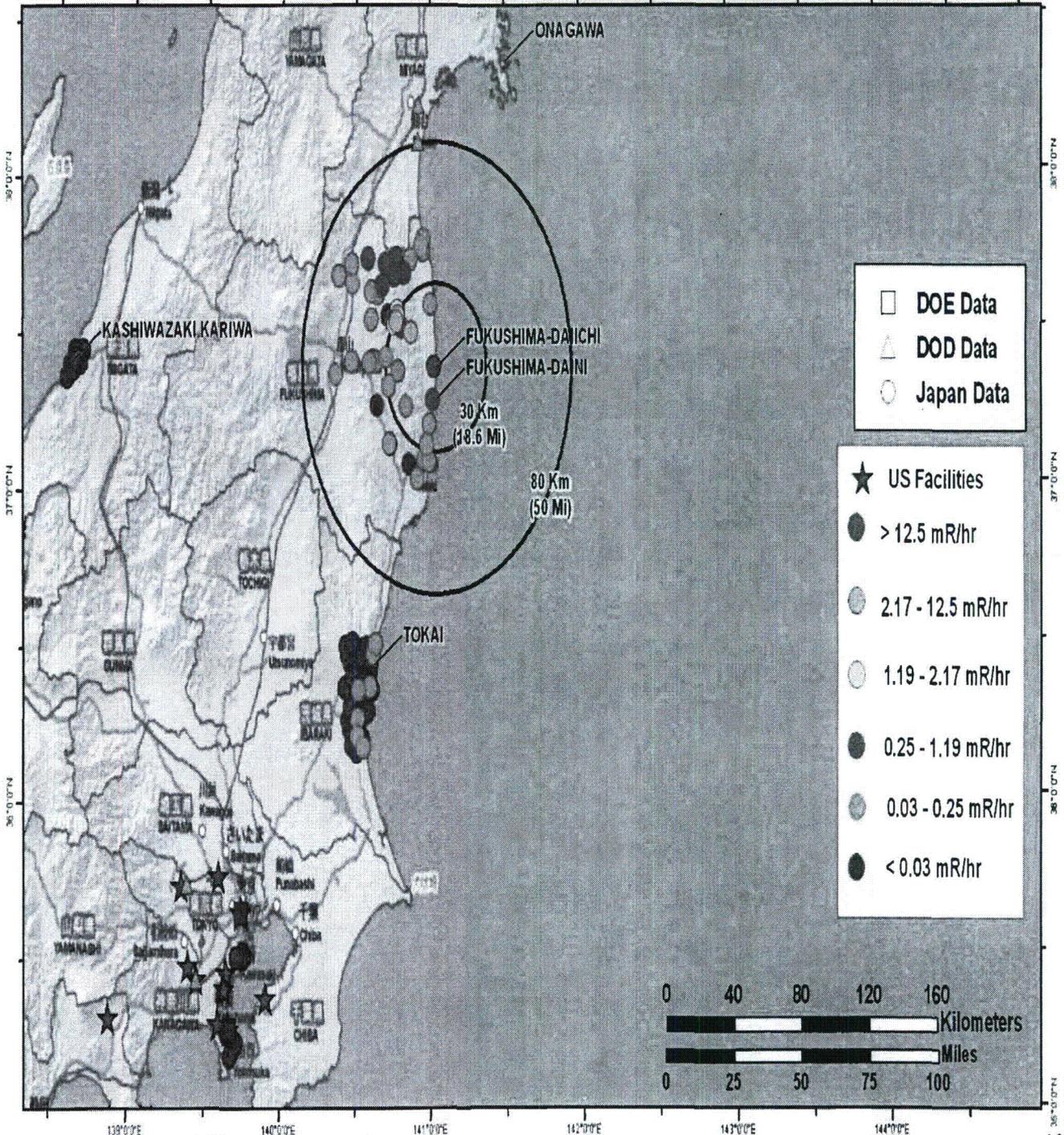
- ◆ Areas 10 to 100 times historical background are indicated by green.
- ◆ Areas 2 to 10 times historical background are indicated by light blue.
- ◆ Areas at or near historical background are indicated by dark blue.



# Field Monitoring Results

April 5 01:00 to April 6 01:00 JST

# FUKUSHIMA DAIICHI JAPAN



Map created on 04062011 0350 JST

Name: NIT 24hrsMonitoringResults 05Apr2011 0100

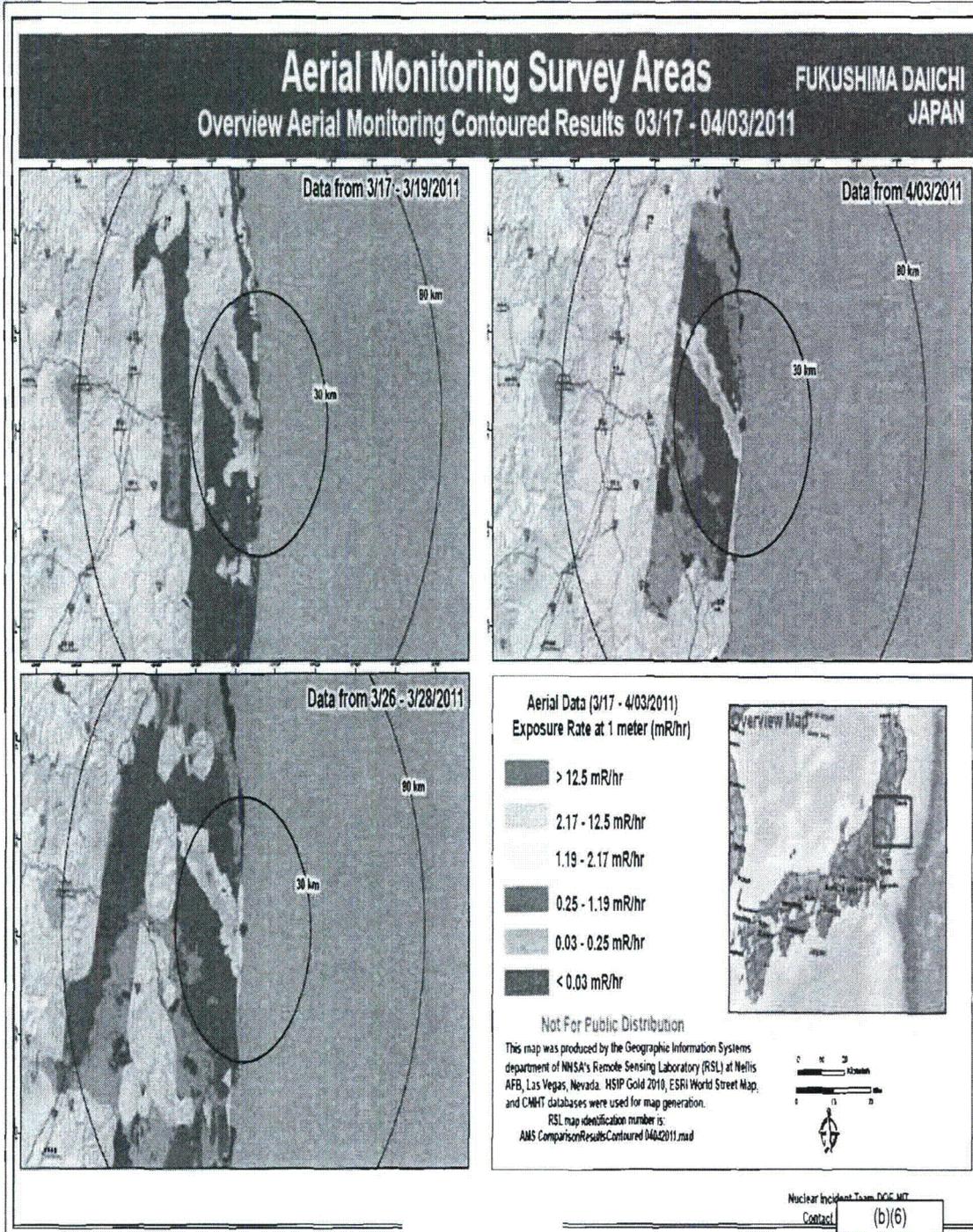
UNCLASSIFIED

Nuclear Incident Team DOE NIT

Contact (b)(6)

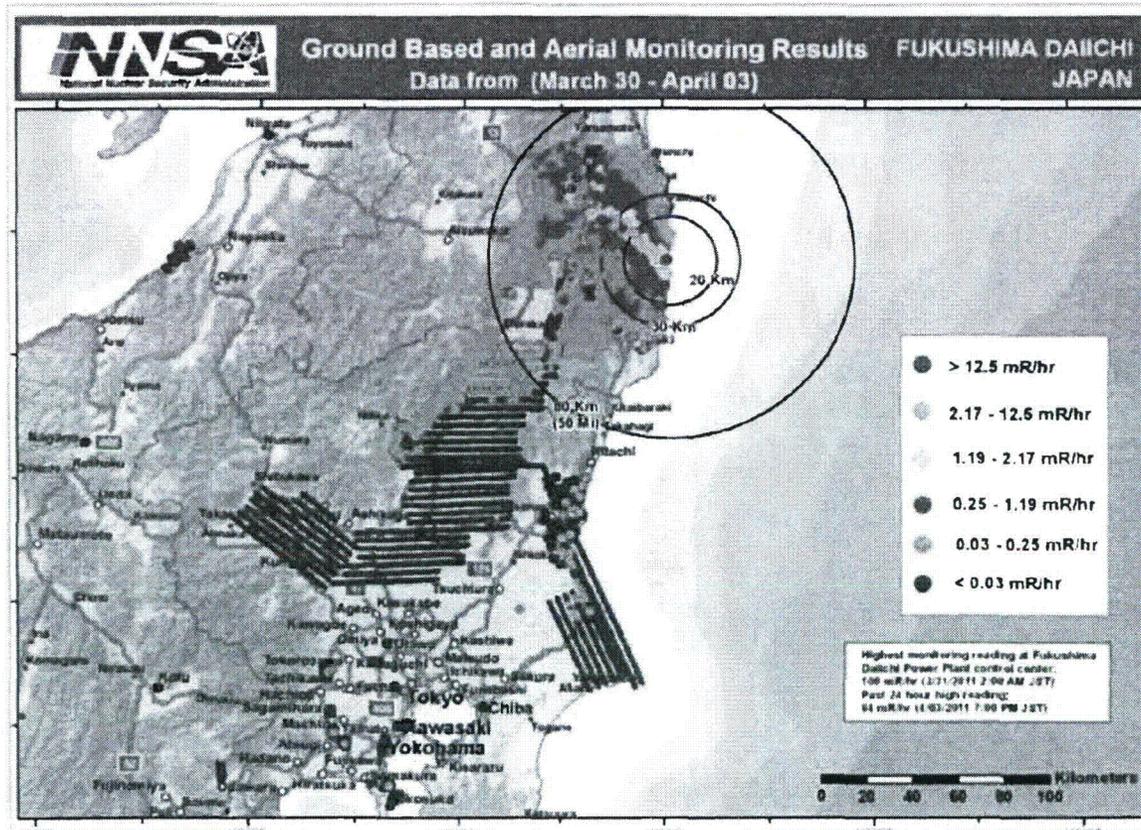


# Time Series Analysis





# DOE/NNSA Monitoring



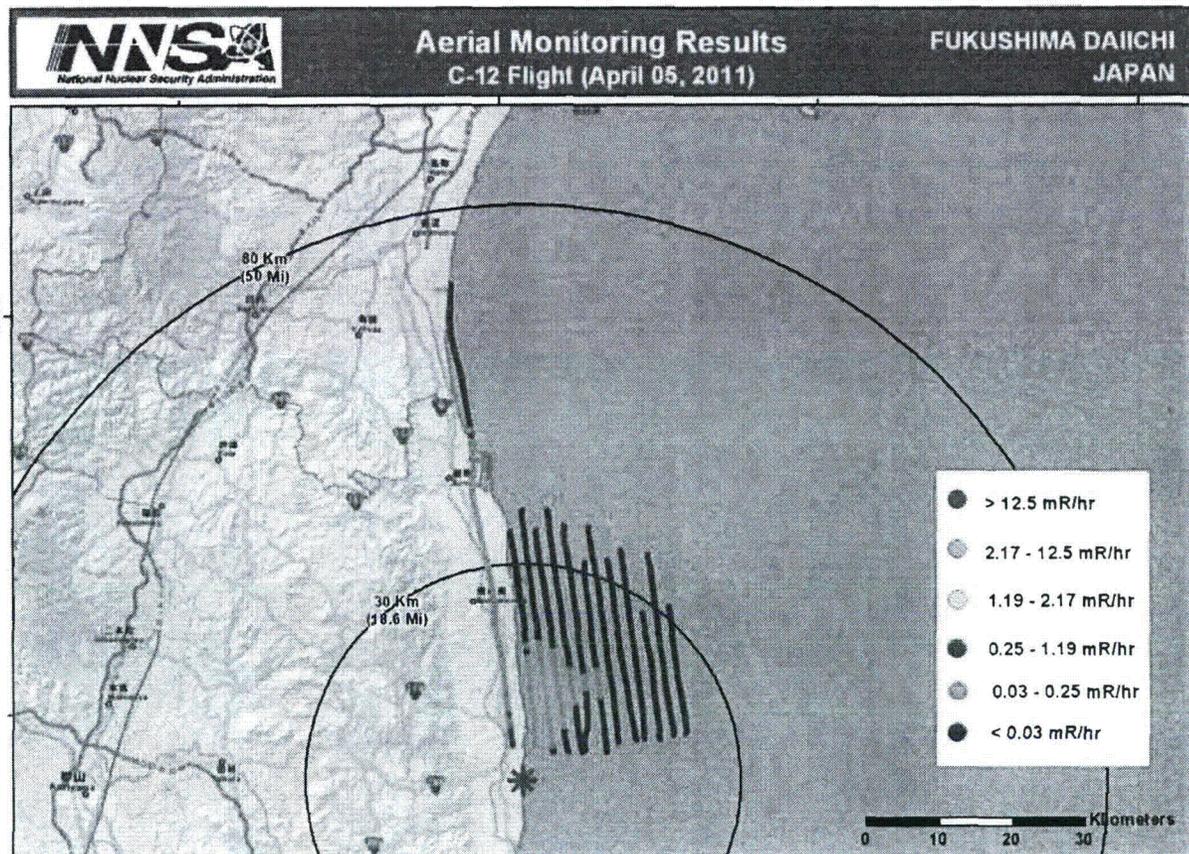
This product is an aggregate of data collected from March 30 – April 3, 2011. Monitoring results are derived from aerial measuring platforms and validated where possible by ground survey teams.

## Assessment:

- Rapid decay of deposited radiological material indicates Radioiodine is the most significant component of dose;
- Radiation levels consistently below actionable levels for evacuation or relocation outside of 25 miles; and levels continue to decrease
- No measurable deposition of radiological material since March 19<sup>th</sup>;
- US bases and facilities all measure dose rates below 32 $\mu$ R/hr – a level with no known health risks;
- Agricultural monitoring and possible intervention will be required for several hundred square kilometers surrounding the site;
  - Soil and water samples are the only definitive method to determine agricultural countermeasures
  - Ground monitoring can give better fidelity to identify areas that require agricultural sampling



# First Over Water Flight



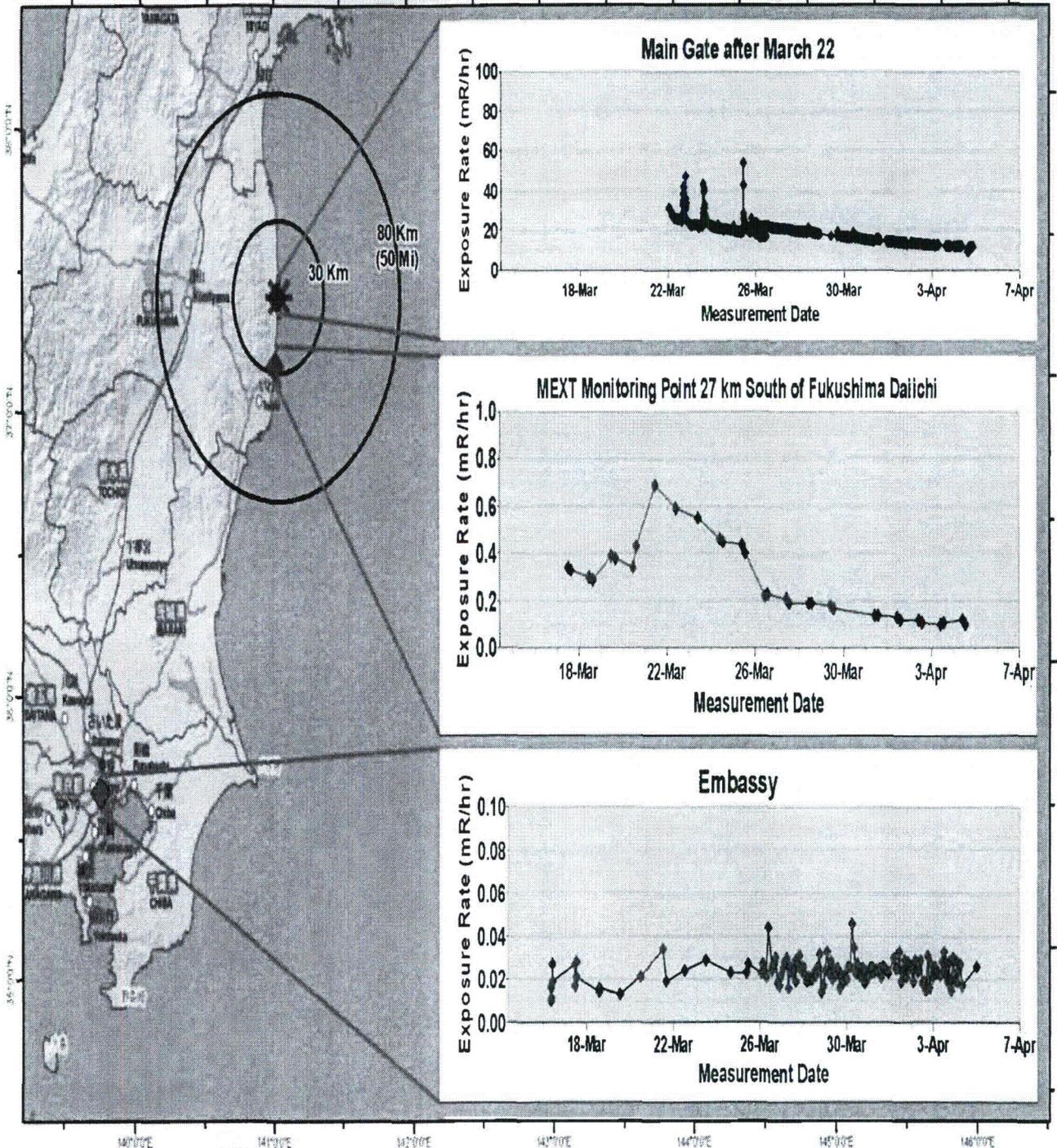
## Assessment:

- ◆ Preliminary DOE measurements indicate a release of radiological material extending 20 kilometers North of the Fukushima plant and greater than 10 kilometers out to sea;
- ◆ Aerial measurements are normally corrected to show contamination on a solid surface; for measurements over water the analysis is more complex since the material is distributed throughout the water column;
- ◆ This aerial survey only reflects radiological material near (or above) the surface and provides a qualitative measure of the contamination;
- ◆ DOE measurements April 5th indicate areas where further measurements and water sampling is advisable;
- ◆ Analyzing water samples is the most direct way of measuring the amount of radiological material in the water:
  - ◆ The Government of Japan is currently sampling water in multiple locations around the plant
  - ◆ These data will be provided to the government of Japan to assist in their monitoring efforts



# Exposure Rate Trends From Fukushima South to the U.S. Embassy

## FUKUSHIMA DAIICHI JAPAN



Map created on 04052011 2300 JST  
Name: CMHT MonTrend 05Apr2011 Simplified

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Nuclear Incident Team DOE NIT

Contact

(b)(6)

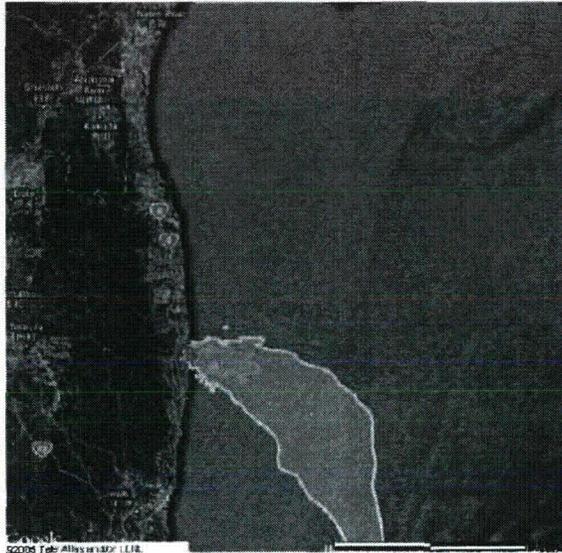


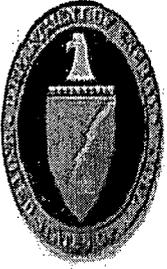
# Forecasted Weather April 6-7, 2011

04/06/2011 07:00:00 JST

04/06/2011 18:00:00 JST

04/07/2011 00:00:00 JST

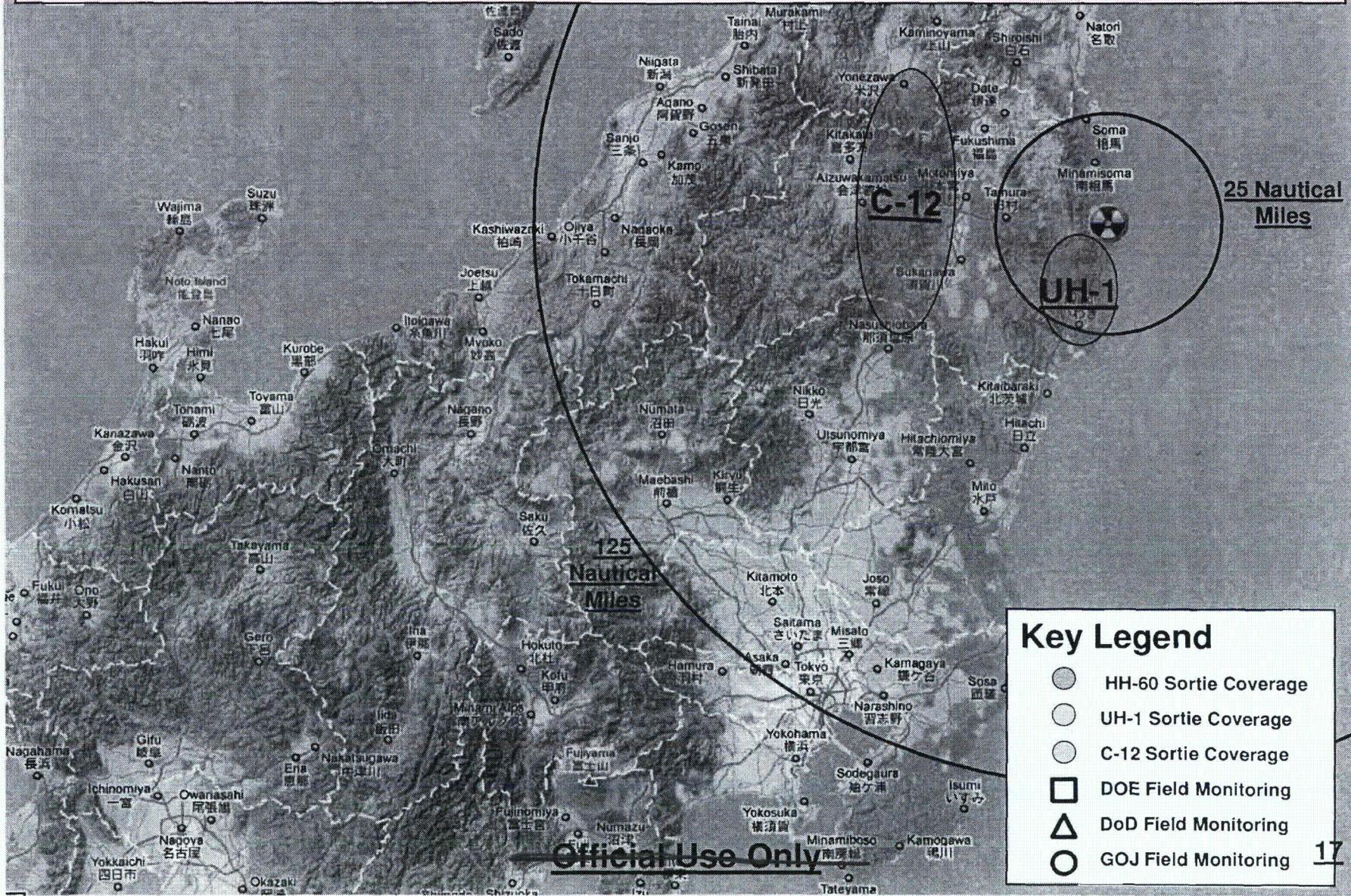




# Planned Operations: Next 24 Hrs

- ◆ Aerial Monitoring
  - AMS UH-1: Fly from Fukushima Daiichi plant south to 30 km line along coast
  - AMS C-12: Fly west of Fukushima Daiichi plant between 40-60 km
  - Flights are being coordinated with GOJ MEXT
    - All areas inside of 80 km from plant will be surveyed in period 6-12 April
    - AMS will fly inside 60 km line; MEXT will fly outside 60 km line
- ◆ Ground Monitoring
  - Complete beta/gamma exposure rate surveys. Radionuclide evaluations are to include in-situ measurement assessment of gamma isotopes.
  - Continue monitoring activities at the US Embassy Japan and the Embassy Resident Towers in Tokyo, Yokota AB, and Yokosuka Naval Base
  - Continuing work to implement the Early Warning Array
- ◆ Ambassador Roos visiting Yokota and will meet with CMRT

# Planned Aerial/Field Monitoring Operations April 6, 2011 Operational Period



**DEPARTMENT OF ENERGY SITUATION REPORT**

**Earthquake & Tsunami in Japan**

6 April 2011

0600 (EDT) UPDATE

*Note: Beginning with the 1800 March 31 SITREP, each entry is labeled with the time and date of the latest SITREP that updated the information. Paragraphs with no indicated time were prepared prior to the 1800 March 31 SITREP and were included as the latest information available. Less frequent information updates are available from Japanese agencies. (0600, 4/2 SITREP)*

(NOTE: JST = EDT + 13 hours; EDT = GMT/UTC - 4 hours).

**POWER PLANT UPDATE AND OTHER NUCLEAR ISSUES**

Per TEPCO, highly contaminated water has stopped leaking into the ocean from a concrete pit near the Number 2 reactor intake at 5:38 PM JST on Wednesday. According to NHK, TEPCO claims the pouring of hardening agents into the gravel below the pit stopped the leakage.

Per TEPCO, it is suspected that hydrogen gas is accumulating inside the Number 1 reactor containment vessel. TEPCO is considering injecting nitrogen gas into the vessel to prevent a possible hydrogen explosion.

There is currently a large amount of radioactive waste water in the turbine buildings of the Fukushima Daiichi reactors (the turbine building of Unit 2 has extremely high level radioactive waste water). In accordance with GoJ regulations, TEPCO has decided to discharge to the sea approximately 10,000 tons of the accumulated low level radioactive water and a total of 1,500 tons of the low level radioactive subsurface water stored in the sub drain pits of Unit 5 and 6. Per TEPCO's evaluation, the impact on the discharge of the low radioactive waste water to the sea if a person eats adjacent fish and seaweeds every day, that person will receive approximately 0.6 mSv of effective radioactive doses per year for adults (equal to one-fourth of the annual radioactive dose to which the general public is exposed in nature). At 1900 JST of April 4, TEPCO began discharging to the sea the low radioactive waste water stored in the Central Radioactive Waste Disposal Facility and the low level radioactive subsurface water stored in the sub drain pits. (0600, 4/5 SITREP)

According to NHK reporting, TEPCO started infusing liquid glass into gravel below the pit near the Number 2 reactor at 3 PM JST on Tuesday. TEPCO spotted a crack in the pit 3 days ago while trying to find the source of the leakage of contaminated water into the Pacific Ocean. Since then, the utility has tried to seal the pit with concrete, or to plug piping leading into it with a polymer mixture. A test using a dye agent showed the possibility that the radioactive water is leaking from a cracked pipe, and then seeping through gravel into the concrete pit. (1800, 4/5 SITREP)

TEPCO is planning to board up the breached sections of an offshore dike to prevent the tainted water from spreading further into the sea. It is also considering building underwater silt barriers at 3 locations, including one near a water intake for the Number 2 reactor. (1800, 4/5 SITREP)

**Update on Reactor Containment Vessels:**

According to the NRC's 4/5 1800 EDT Status Update, damage is suspected in the primary containment vessel of Unit 1, 2, and 3 and there is a slow leakage.

**Updates on Cooling Efforts and Cooling Water Management:**

Per the IAEA, as of 21:15 JST April 4, fresh water continues to be injected into the Unit 1 reactor pressure vessel through the feed-water line (NRC says fire extinguisher line citing TEPCO) using a pump powered with offsite electric power. Per the IAEA, as of 21:15 JST April 4, fresh water continues to be injected into the Units 2 and 3 reactor pressure vessels through the fire extinguisher line using a pump powered with offsite electric power. (1800, 4/4 SITREP)

**Radiation Detection Updates:**

Per the Nuclear Energy Institute, radiation dose rates at the Daiichi site continue to fall. Recent readings showed 12.4 millirem per hour at the main gate, 7.4 millirem per hour at the west gate and 78 millirem per hour on the side of the administration building facing the reactors. (1800, 4/4 SITREP)

Per JAIF as of 1500 JST on April 5, Radiation levels were 0.72mSv/h at the south side of the office building, 112  $\mu$ Sv/h at the Main gate and 49  $\mu$ Sv/h at the West gate. (1800, 4/5 SITREP)

**(Official Use Only) Field Measurements Update (Updated each SITREP):**

Recent events of past 24 hours:

- Field Monitoring and Assessment
  - AMS UH-1: Flew from the Fukushima Daiichi plant south to the 30 km line along the coast.
  - AMS C-12: Did not fly today.
  - Ground teams: No ground monitoring teams today due to personnel swap out. Continued monitoring activities at the US Embassy Japan and the Embassy Resident Towers in Tokyo, CMOC TOC at Yokota AB, and Yokuska Naval Base.

Planned operations over the next 24 hours:

- Aerial Monitoring
  - Flights will be coordinated with GOJ MEXT

- All areas inside of 80 km from the plant will be surveyed in the period 6-12 April
- AMS will fly inside the 60 km line; MEXT will fly outside the 60 km line
- AMS UH-1: Continue flying from the Fukushima Daiichi plant south to the 30 km line along the coast.
- AMS C-12: Fly the postponed flight from 5 April, west of the Fukushima Daiichi plant between 40-60 km. This flight is in support of the coordinated aerial missions with MEXT.
- ♦ Ground Monitoring
  - Complete beta/gamma exposure rate surveys. Radionuclide evaluations are to include in-situ measurement assessment of gamma isotopes.
  - Continue monitoring activities at the US Embassy Japan and the Embassy Resident Towers in Tokyo, Yokota AB, and Yokosuka Naval Base.
  - Continuing work to implement the Early Warning Array

**Updates by Reactor Unit** (Updated each SITREP)

**Fukushima Daiichi Unit 1 reactor**

- Per the IAEA, as of UTC April 3, fresh water continues to be injected into the reactor pressure vessel through the feed-water line at an indicated flow rate of 6 m<sup>3</sup>/h using a pump powered with offsite electric power (See above)
- Per JAIF at 0000 JST 6 April, reactor parameters are: RPV pressure (A) 0.304 MPa Gauge (G), (B) 0.632 MPa G; water level 1.65/1.65 meters below the top of the fuel rods; containment vessel pressure 0.150 MPa absolute (abs); RPV feedwater nozzle 221.6 °C; SFP thermography 18 °C at 0720 4 April
- Per NISA, a test water spray over the SFP using concrete pump truck was carried out on 2 April to confirm the appropriate position for water spray.
- As of April 1, 1100 JST water level in trench is 1.14m below floor level.
- On March 24, the NRC estimated that Unit 1 had 70% core damage.
- The reactor vessel and primary containment are intact.
- Unit #1 contains 292 elements.
- **Fukushima Daiichi Unit 2 reactor**
  - Per the IAEA, as of 21:15 JST April 4, fresh water continues to be injected into the reactor pressure vessel through the fire extinguisher line at an indicated flow rate of 8 m<sup>3</sup>/h using a pump powered with offsite electric power.
  - Per JAIF 0000 JST 6 April, RPV pressure (A) -0.018 MPa G, (B) -0.023 MPa G; water level 1.50 meters below the top of the fuel rods; containment vessel pressure 0.100 MPa abs, the indicated temperature at the feed water nozzle of the RPV is 140.9 °C and bottom head is not reported; SFP temperature is 68°C
  - As of April 1, 1100 JST, water level in the trench is 1.04 meters below floor level.
  - On March 24, the NRC estimated that Unit 2 had 33% core damage.
  - Unit#2 SFP contains 587 elements.

- **Fukushima Daiichi Unit 3 reactor**
  - Per the IAEA, as of 2115 JST April 4, fresh water continues to be injected into the reactor pressure vessel through the fire extinguisher line at an indicated flow rate of 7 m<sup>3</sup>/h using a pump powered with offsite electric power.
  - Per JAIF 0000 JST 6 April, RPV pressure (A) 0.009 MPa G, (B) -0.081 MPa G; containment vessel pressure 0.1069 MPa absolute (abs); water level 1.85 (A) 2.25 (B) meters below the top of the fuel rods; containment vessel pressure 0.1078 MPa abs
  - Per IAEA at 2115 JST on April 3, the indicated temperature at the feed water nozzle of the RPV is about 114 °C (validity still under investigation) and at the bottom of RPV is about 90 °C.
  - As of April 1, 1100 JST, water level in trench is 1.55m below floor level.
  - Fresh water injection to the unit 3 Spent Fuel Pool via the Cooling and Purification Line continues. SFP thermography 56 °C as of 0750 April 3 (1800, 4/4 SITREP).
  - On March 24, the NRC estimated that Unit 3 had 33% core damage.
  - Unit #3 SFP contains 514 elements.
  
- **Fukushima Daiichi Unit 4 reactor**
  - Unit 4 is shutdown with the core removed to the spent fuel pool in December for maintenance on the reactor.
  - Per JAIF, the SFP thermography was 50 °C at 0720 April 5 Per TEPCO water spray by the concrete pump truck to Unit 4 was conducted from 1735 to 1822 on April 5th
  - Per NISA, freshwater spray to the Spent Fuel Pool using Concrete Pump Truck (50t/h) took place at 08:25 UTC on April 1.
  - Unit #4 SFP contains 1331 elements.
  
- **Fukushima Daiichi Unit 5 reactor**
  - Unit 5 was in a refueling outage at the time of the earthquake.
  - Per NISA as of NISA March 30: Reactor pressure 0.108 MPa abs, reactor water level 2.161 m above the top of the fuel rods, reactor water temperature is 29.9°C.
  - Per JAIF, as of 0500 JST 6 April, the SFP water temp was 34.4°C
  - Unit #5 SFP contains 946 elements.
  
- **Fukushima Daiichi Unit 6 reactor**
  - Unit 6 was in a refueling outage at the time of the earthquake.
  - Per NISA as of 06:00 March 31: Reactor pressure 0.104 MPa, Reactor water temp 32.6°C, reactor water level 1.703 m above the top of the fuel rods.
  - Per JAIF, as of 0500 JST 6 April, SFP water temp was 26.0°C Unit #6 SFP contains 876 elements.

### **Fukushima Daiichi Common Spent Fuel Pool**

At 1000 on 18 March, it was confirmed that water level in the pool was secured. Japanese authorities have confirmed that fuel assemblies there are fully covered by water. The IAEA reported on April 4, 2011, that the Common Spent Fuel Pool temperature was 32 °C at 23:10 UTC on 2 April.

### **Other Information**

#### **UPDATE ON USG COORDINATION**

According to communications from the NSS, Richard Reed and AMB Jeff Bader will host an Assistant Secretary-level interagency policy committee (IPC) meeting on the ongoing situation in Japan via SVTC tomorrow, April 6, from 3:45-5:00pm. The objective of the IPC is to review taskings from Friday's PC and yesterday's DC, and to map the way ahead. Agencies should be prepared to report the status of progress on previous DC taskings. (1800, 4/5 SITREP)

USG and GOJ interagency crisis management teams met at 1900 on April 4, led on the U.S. side by the DCM, NRC team lead Chuck Casto, RADM Thomas Rowden, and USFJ Deputy Commander BG Blake Crowe. The Japanese side was led by Diet Member and Special Advisor to the Prime Minister Goshi Hosono who chaired for the Japanese side, along with Deputy Chief Cabinet Secretary Tetsuro Fukuyama. The Japanese side included senior Cabinet Secretariat officials and representatives of MOD, MOFA, METI, MEXT, MLIT, MHLW, NSC, NISA, and TEPCO. The Japanese side reported on progress to date by project teams on reactor confinement, spent fuel transfer and remote control equipment. The GOJ also reported that three additional project teams are already working at TEPCO on construction of a long-term, stable cooling system for the reactors; collection and recycling of radioactive waste water; and environmental impact of radioactivity. The U.S. side described a USG effort to harmonize and track requests and offers of assistance and provided a draft spread sheet and a one-page form proposed to be used for documenting future requests. The GOJ indicated it would review the information and prioritize its requests, while reiterating that the bilateral Crisis Management Team meeting should continue to serve as the central clearinghouse for GOJ requests. (0600, 4/5 SITREP)

According to NRC's April 4<sup>th</sup> 1800 EDT Status Update, it was discussed in the Agency Deputies meeting that DOE is the lead for interagency technical support to Japan. (0600, 4/5 SITREP)

According to NRC's April 4<sup>th</sup> 1800 EDT Status Update, a white paper is being developed for the return of U.S. citizens to the Tokyo area. The paper will be finalized by April 6<sup>th</sup>. (0600, 4/5 SITREP)

#### **UPDATE ON US ASSISTANCE (updated per 4/5 20:59 email from J. Tilden)**

April 5, 8pm, Summary of Industry Consortium Teleconference Meeting:

Further details on the very large Putzmeister concrete pump being flown to Japan. Per email from Putzmeister USA president Dave Adams, two 70 foot concrete pumps, one from LA and one from SRS via Atlanta, was flown via Antonov 225 at TEPCO expense to Tokyo, due to arrive at the end of this week (Thursday or Friday). Cost was ~\$1.3 mil per truck.

NE stated no change to the task focused on concept studies regarding the handling and treatment of wastewater, since this will be an ongoing activity. The other task, the transfer and shipment of 5 large stainless steel tanks and a high-activity analysis trailer, is ongoing. We asked the Embassy team via this telecom and a separate email, if this was a high priority item. If yes, would TEPCO be willing to foot transport bill similar to the Putzmeister trucks?

- NE and NNSA are to work with SRS to determine the most timely transportation options for the 5 large tanks and trailer.

- TALON robot, the 5 radiation hardened cameras, the one GammaCam, and three additional radiation sensors did ship on April 5, with arrival in Japan on Friday, April 8, 2011.

Per TEPCO-NISA's request, DOE SRS is providing five stainless steel ~16,000 gallon storage tanks and one ~1000 gallon high activity trailer, all of which can support water characterization and process development efforts. Further, a specialized pump from Hanford was also offered. Transportation, likely commercial, for this equipment is being arranged with no arrival date yet established. (0600, 4/5 SITREP)

Interagency Working Group on Ocean Plume Modeling. (Per 4/5 19:31 email from S. Aoki)

The initial meeting of the Working Group will be held April 7<sup>th</sup> from 10-11:30 at NOAA.

#### **ENERGY INFRASTRUCTURE:**

**ELECTRICITY:** As of April 4th 12:00 AM JST, Japan's Ministry of Economic, Trade, and Industry reports that of the households that can receive power, 170,000 households remain without electricity in Japan. These customers are all located in Tohoku Electric Power Company's service area. There are no rolling blackouts scheduled for today or tomorrow (April 5 & 6) in the Tokyo Electric Power Company's (TEPCO) service area. Moving forward, rotating blackouts may still be implemented for select areas in TEPCO's service areas. (1800, 4/5 SITREP)

**PETROLEUM:** According to a report yesterday (April) from Japan's Ministry of Economic, Trade, and Industry, three oil refineries' operations remain suspended. Those

refineries are the JX Sendai (145,000 b/d), JX Kashima (189,000 b/d), and Cosmo Chiba (220,000 b/d). Since the earthquake three refineries have restarted operations, the Kyokutou (175,000 b/d), TonenGeneral Kawasaki (335,000 b/d), and JX Negishi (270,000 b/d). (1800, 4/5 SITREP)

#### **CONTACTS WITH GOJ OFFICIALS:**

As per US Embassy reporting, at a coordination meeting led by the PM's Special Advisor Hosono, the Japanese side raised the issue of reimbursement for our nuclear-related assistance. According to Mitsugu Saito of the cabinet secretariat, the GOJ is hoping to receive a list of our reimbursement requests as soon as possible. The first supplementary budget request will go to the Diet within a month. There may be only one or two weeks to incorporate final proposals once the decision is made to submit the budget request. This is not necessarily the last chance to get our reimbursement requests into the budget, since another supplementary budget proposal is likely to follow in the future. Saito said the decision was made only yesterday afternoon to designate METI as the overall coordinator for the budget aspects of the assistance the GOJ is receiving. No office in METI has been identified yet to have the lead. For now, the cabinet secretariat will be the Embassy's POC. (1800, 4/5 SITREP)

#### **Media Reports**

##### **New York Times 4/5 "U.S. Sees Array of New Threats at Japan's Nuclear Plant"**

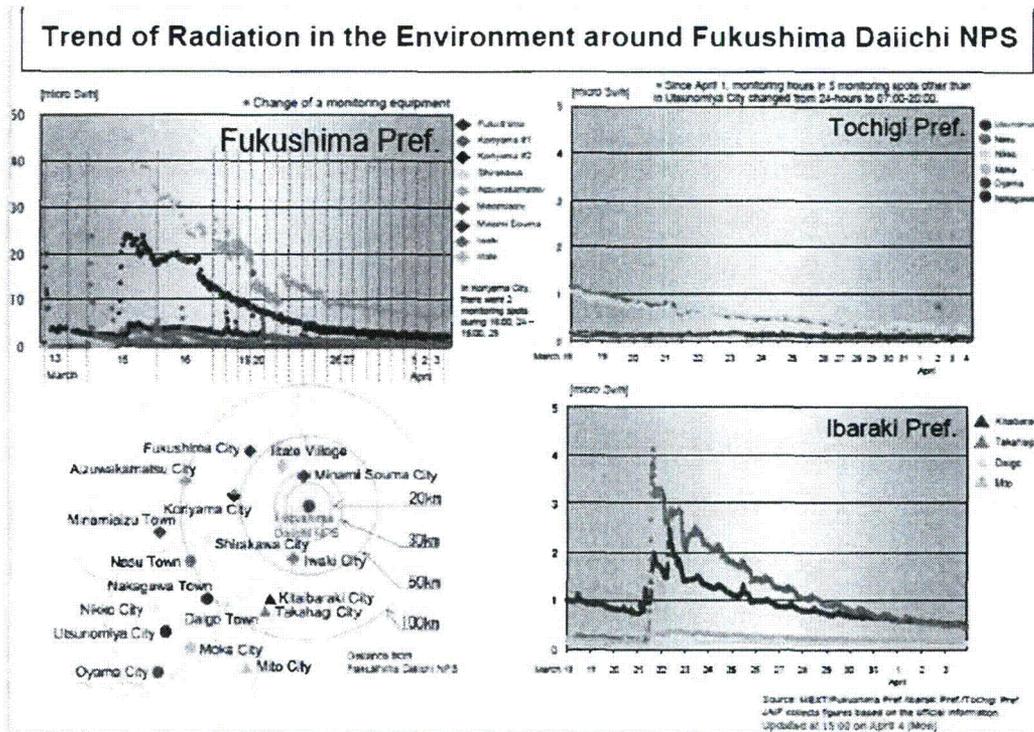
**United States government engineers sent to help with the crisis in Japan are warning that the troubled nuclear plant there is facing a wide array of fresh threats that could persist indefinitely, and that in some cases are expected to increase as a result of the very measures being taken to keep the plant stable, according to a confidential assessment [dated March 26] prepared by the Nuclear Regulatory Commission.**

Kyodo News 4/5. Japan set a legal limit Tuesday for the permitted level of radioactive iodine in seafood as safety concerns spread overseas in the wake of continuing leaks of contaminated water into the Pacific Ocean from the crippled Fukushima Daiichi nuclear power plant.

The limit of 2,000 bequerels per kilogram set by the Ministry of Health, Labor and Welfare for radioactive iodine in marine products such as fish and shellfish is the same as that already adopted for vegetables, Chief Cabinet Secretary Yukio Edano told a press conference. The imposition of the limit followed the detection by Japanese authorities of 4,080 bequerels per kilogram of radioactive iodine in young sand lance caught Friday off Kitaibaraki in Ibaraki Prefecture, which prompted the health ministry to consider setting a limit for fish and clams. Chief Cabinet Secretary Yukio Edano dismissed the need for an immediate ban on shipments of marine products from the affected areas, but he pledged to toughen inspections to ensure that contaminated products do not reach markets. The government will make further efforts to provide sufficient information to

other countries through diplomatic channels regarding its efforts to contain the leak of radioactive substances from the plant, the top government spokesman added. (Kyodo News, April 5) (4/5, 1800 SITREP)

“Trend of Radiation in the Environment around Fukushima Daiichi NPS” (Graphic at Japan Atomic Industry Forum, April 5).



[http://www.jaif.or.jp/english/news\\_images/pdf/ENGNEWS01\\_1301966088P.pdf](http://www.jaif.or.jp/english/news_images/pdf/ENGNEWS01_1301966088P.pdf)

According to NHK reporting, the Japanese government has decided to suspend discussions on revising Japan's nuclear policy until the crisis at the Fukushima Daiichi power plant is over. The Cabinet Office's Atomic Energy Commission met on Tuesday for the first time since the March 11th earthquake and tsunami crippled the plant. The commission said it is taking the accident at the nuclear plant under the gravest consideration and that it has shaken the country's basic confidence in atomic power generation. Last year in December the commission launched discussions for revising the national outline on the use of nuclear energy. The current outline was formed in 2005. It covers basic policies on the use, research, development and promotion of nuclear power. The commission says it will decide its next step depending on developments at Fukushima and how the national debate on Japan's energy policy evolves. The commission chief, Shunsuke Kondo, said there is no denying that there are defects in Japan's nuclear safety standards. He added that the commission's existence itself could be questioned in the future and ruled out any new moves by the regulatory body until the

Fukushima crisis is resolved. Kondo suggested that the accident at the plant will have a major impact on the government's policy on the use of nuclear power in Japan. Tuesday, April 05, 2011 16:52 (JST)

According to NHK reporting, Radiation measurements have exceeded levels at which people are advised to stay indoors in a town outside the 30-kilometer radius of the damaged Fukushima Daiichi nuclear plant. The science ministry continues to monitor radiation levels in areas where residents have not been advised by the government to evacuate or stay indoors. The monitoring detected 10.3 millisieverts of radiation at one location in Namie Town, some 30 kilometers northwest of the plant. The amount is calculated on the assumption that a person has remained outdoors for 11 consecutive days through Sunday. The finding is higher than the 10 millisieverts the government views as the criteria for remaining indoors. The Nuclear and Industrial Safety Agency (NISA) says that as the radiation level was only detected in a limited area, it does not intend to expand the indoor advisory zone at present. Monday, April 04, 2011 21:21 (JST)

According to the Kyodo News Service, a plan to cover damaged reactor buildings at the crisis-hit Fukushima nuclear plant with special sheets to halt radiation leakage cannot offer a quick remedy, as the sheeting will be installed in September at the earliest due to high-level radioactivity hampering work at the site, government sources said Tuesday.

The government had asked Tokyo Electric Power Co., operator of the Fukushima Daiichi power station crippled by the March 11 quake and tsunami, to study the installment of radiation-shielding sheets, and a major construction firm commissioned to examine the idea said the construction will not start until June, the sources told Kyodo News.

They said workers need to wait until radiation levels drop at the site, where hydrogen explosions have blown away the roofs and upper walls of three reactor buildings.

At the gathering, a specialist from the U.S. Nuclear Regulatory Commission said the structure of the special sheets should guarantee that spent nuclear fuel pools in the reactor buildings will not be damaged even if the sheeting is toppled by quakes or typhoons, according to the sources.

Specialists in the government are planning to stem possible surges in radiation levels or further explosions in the reactor buildings to be wrapped by the sheets, by attaching materials that absorb radioactive materials to the inner side of the sheeting and installing air vents with filters to let out hydrogen, they said.

The costs of building framed structures around the Nos. 1-4 reactor buildings and wrapping them with the special sheets are estimated to reach 80 billion yen. (4/5, 1800 SITREP)

**CONTACT INFORMATION:**

**Nuclear Incident Team in the Emergency Operations Center**

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**Office of the Deputy Secretary 202-586-5500**

**Watch Schedule April 5:**

Rhys Williams                      1600-2000/5 April  
Craig Welling

**Watch Schedule April 6:**

Chris Behan                        0400-0800  
Brian Robinson

James Conner                      1600-2000  
Carl Sink