Documents (59)

Group AR

(Records Withheld In Part)

DEPARTMENT OF ENERGY SITUATION REPORT
Earthquake & Tsunami in Japan
1 April 2011
0600 (EDT) UPDATE

POWER PLANT UPDATE AND OTHER NUCLEAR ISSUES

Summary of information received as of 0600 (EDT) 1 April from the NRC, Embassy-Tokyo, IAEA Incident and Emergency Center, TEPCO, METI, NISA, Japan Atomic Industrial Forum, Nuclear Energy Institute, and media outlets. (NOTE: JST = EDT + 13 hours; EDT = GMT/UTC – 4 hours).

Note: With the 1800 March 31 SITREP we started labeling each entry 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.

Updates on Reactor Vessel Integrity:

Per JAIF as of 0300 EDT April 1, it is presumed that radioactive material inside the reactor vessel may have leaked outside Units 1, 2 and 3. NISA announced that the reactor pressure vessel of Units 2 and 3 may have lost air tightness judging from the low pressure inside the pressure vessel. NISA reports that it is unlikely that these are cracks or holes in the reactor pressure vessels. (0600, 4/1 SITREP)

Per IAEA as of 1000 EDT March 31, pumping of water from the Unit 1 turbine building has been stopped. Per NEI as of March 31, workers finished pumping water from Unit 3 turbine building and had started pumping contaminated water from the Unit 2 turbine building into a storage tank. (1800, 3/31 SITREP)

Per JAIF as of 0643 EDT, March 31, work began to transfer water from Unit 1 tunnel to a storage tank to prevent it from flowing out to sea. (1800, 3/31 SITREP)

Per the IAEA, the Nuclear Safety Commission of Japan suggests that higher activity in the water discovered in the Unit 2 turbine building is supposed to be caused by the water, which has been in contact with molten fuel rods for a time and directly released into the turbine building via some, as yet unidentified, path. An investigation is underway as to how the water accumulated in the trenches. (0600, 3/31 SITREP)

Updates on Cooling Efforts and Cooling Water Management:

JAIF reports that, as of 0300 EDT April 1:

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- "Steam-like substance" rose intermittently from the reactor building at Units 1, 2, 3 and 4 – spent fuel pools suspected source. Injecting and/or spraying water to the spent fuel pool has been conducted.
- Water injection to the reactor pressure vessel by temporally installed pumps was switched from seawater to freshwater at Units 1, 2 and 3.
- High radiation circumstance hampering the work to restore originally installed pumps for injection. Discharging radioactive water in the basement of the buildings of Units 1, 2, and 3 continue to improve this situation. (0600, 4/1 SITREP)

The IAEA reported at 1400 EDT, March 31 based on NISA press releases:

- The Unit 1 condenser is full. Pumping water from the Unit-1 turbine building basement to the Unit-1 condenser was stopped as of 18:30 EDT on 28 March. In preparation for transferring water in the basement of the turbine building to the condenser, water in the condenser storage tank is being transferred to surge tank of the suppression pool since March 3, 23:00 EDT. Water in the trench was transferred to a water tank at the central environmental facility process main building, and the water level in the trench was reduced from - 0.14 meter (measured from the top) to -1.14 meter on March 31 during 00:20-02:25 UTC. [NISA press release #65]
- On Unit 2 in order to prepare for removal of the water from the turbine building basement, pumping of water from the condenser to suppression pool water surge was started at 03:45 EDT 29 March. [NISA press release #64]
- On Unit 3 in order to prepare for removal of the water from turbine building basement, pumping of water from the condenser to suppression pool water surge was started at 04:40 UTC on March 28 and completed at 23:37 UTC on 30 March. [NISA press release #65] (0600, 4/1 SITREP)

On April 1, the Kyodo News reports that fresh water carried by a U.S. Navy barge will soon be delivered to tanks at the plant to be injected into the reactors. The barge contains 300,000 gallons of fresh water and is now moored at the Daiichi power station, while another ship carrying an additional 200,000 gallons is expected to arrive later Friday. (0600, 4/1 SITREP)

The NRC reported that as of 0430 EDT March 31 one train of temporary cooling equipment had been transported to Yokota Air Force Base and that two fresh water barges from the US Navy were en route to the Daiichi site. (1800. 3/31 SITREP)

Updates on Electrical Power Restoration Efforts:

No updates since 0600 March 29 SITREP. Power distribution panels (Power Centre) in Units 2 and 4 connected to the off-site electrical supply; lighting in units 1, 2 and 3 control rooms restored; some instrumentation recovered for units 1, 2 and 4 with individual components are still being checked prior to being energized. (0600, 4/1 SITREP)

Updates on Injuries and Exposure of Daiichi Workers:

The IAEA reported at 1400 EDT, March 31 that NISA had reported 20 workers at the Fukushima Daiichi plant had received in excess of 100 mSv (10 Rem). (0600, 4/1 SITREP)

JAIF reports that as of 0300 EDT April 1, there is a plan to spray synthetic resin to contain contaminated dust. (0600, 4/1 SITREP)

Radiation Detection Updates:

JAIF reported as of 2000 EDT March 31:

- Radiation levels were 0.91mSv/h at the south side of the office building, 150μSv/h at the Main gate, 71μSv/h at the West gate as of 2000 EDT March 31.
- 4.8μSv/h at the border of the nuclear power plant at 2000 March 31. (0600, 4/1 SITREP)

The IAEA reported as of 1000 EDT on March 31 new results from the marine monitoring stations 30 km off-shore for 28 March.

- A decrease for the northernmost sampling station for I-131 and a slight increase for Cs-137 as compared to values measured on 27 March.
- For sampling points situated towards the south of the transect an increase both for I-131 and for Cs-137 as compared to the previous day, with maximum concentrations in water below 30 Bq/l and 20 Bq/l respectively, still considerably lower than the maxima recorded on 23 March (correlates with trends in concentrations measured close to the discharge points).
- The latest analyses in seawater 330 m south of the discharge point of NPP Units 1-4, and 30 m north of the discharge point of Units 5-6 were made available for 29 March with readings of 130 000 Bq/l of I-131, 32 000 Bq/l of Cs-137 and 31 000 Bq/l of Cs-134 were reported near Units 1 - 4. (1800, 3/31 SITREP)

JAIF reported as of 0800 March 31:

- The radiation dose was higher than 1000 mSv at the surface of water accumulated on the basement of Unit 2 turbine building and in the tunnel for laying piping outside the building on March 27.
- Plutonium was detected from the soil of the Fukushima Daiichi NPS site on Mar. 28th. The concentration of plutonium measured is as little as in normal environment, almost the same as measured in Japan when the nuclear bomb tests were conducted in the atmosphere in the past, and not harmful to human body.
- Radioactive materials exceeding the regulatory limit had been detected from seawater samples collected in the sea surrounding the Fukushima Dai-ichi NPS since March 21. Radioactive Iodine, I-131, with 4,385 times higher than regulatory limit detected on March 30. (1800, 3/31SITREP)

JAIF reported as of 0800, March 31 that radioactive material in milk and agricultural products from Fukushima and neighboring prefectures. GOJ issued orders to limit

shipment and intake for some products. Radioactive iodine exceeding the provisional legal limit was detected from tap water sampled in some prefectures from March 21 to 27. GOJ advised not to drink the water in those regions, then lifted the advice on March 28 except for four cities and villages in Fukushima prefecture. (1800, 3/31 SITREP) By Mar. 31, advice was lifted for all regions except for one city and a village in Fukushima prefecture. (0600, 4/1 SITREP)

JAIF reported as of 0800, March 31 that the IAEA reported radiation levels twice as high as its criterion for evacuation in a village 40 kilometers from Fukushima Daiichi, outside the 20 kilometer exclusion zone and the 20-to-30 kilometer alert zone where DOJ has advised voluntary evacuation. The IAEA said its experts measured levels of I131 and Cs137 in soil around the plant between March 18th and 26th. It said measurements in Iitate Village, 40 kilometers northwest of the Fukushima plant, were double the IAEA operational criteria for evacuation and that it had advised DOJ to carefully assess the situation. In Tokyo on Thursday, Japan's Chief Cabinet Secretary Yukio Edano told reporters the reported radiation levels in Iitate will not have an immediate impact on human health but could be harmful if exposed over a long period of time. He said the government will closely assess the long-term impact and take appropriate action. (1800, 3/31 SITREP)

On 31 March, Kyodo news reported that radioactive iodine-131 at a concentration of 4,385 times the maximum level permitted under law has been detected in seawater near the plant. In addition, Japanese authorities were also urged to consider taking action over radioactive contamination outside the 20-kilometer evacuation zone around the plant, as the International Atomic Energy Agency said readings from soil samples collected in the village of Iitate, about 40 km from the plant, exceeded its criteria for evacuation. (0600 3/31 SITREP)

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

Recent events of past 24 hours:

Modeling

- NARAC: Continued work on products normalizing NARAC models to measurements taken in the field. Preliminary assessment of release from Unit 2 resulting in deposition extending to the Northwest. Further assessment of dose rate measurements correlated to plume passage ongoing.

Field Monitoring and Assessment

- Continued monitoring activities at the US Embassy Japan
  - AMS UH-1: Flew the southern half of Tohoku Expressway south of Kortyama to the hills north of Kurolso to complete planned mission from 3/30.
  - AMS HH-60: Flew the southern half Tohoku Expressway north of Kortyama to the north side of Fukushima to complete planned mission from 3/30.

    - AMS C-12: Flew the metro area of north Tokyo across the valley flying east to west at the request of GOJ.
    - One ground team drove out to the east side of Tokyo Bay to Choshi, drive up the coast to the Tokai NPP then return. Teams conducted beta/gamma surveys, in-situ gamma spec and low-volume air sample for particulate/iodine.
    - One ground team traveled to Yokuska to collect the air sample.
- Triage analysis of Air filters for US Embassy and Harris Towers complete.

Medical Consult
- Responded to RFI on bioassay for U.S. workers deployed to Japan

Planned operations over the next 24 hours:
- Aerial Monitoring
    - AMS UH-1: Fly approximately 50-65 NM west of the plant at 500 ft AGl at 2000 ft line spacing.
    - AMS HH-60: Fly approximately 55-70 NM west/southwest of the plant at 500 ft AGl at 2000 ft line spacing.
    - AMS C-12: Fly approximately 20-40 NM west of the plant.
- Ground Monitoring
    - TBD
    - One ground team will travel to Yokosuka to collect air samples
    - When approved: Coordinate with AFRAT to insert 8 DOE "Infield" radiation search systems for use as Distance Early Warning line.
- Continue joint Monitoring and Assessment planning with DoD (US AFRAT).

Updates by Reactor Unit (Updated each SITREP)

Fukushima Dai-ichi Unit 1 reactor (NRC priority 1):
According to IAEA, injection of freshwater into the reactor core continues as of 1400 UTC on March 31 through a feedwater line at an indicated flow rate of 8.0 m3/h. The pumping of freshwater into the RPV has been switched from fire trucks to temporary electrical pumps with diesel backup.

Per JAIF at 0000 JST 1 April, reactor parameters are: RPV pressure (A)0.293MPa; (B)0.482 MPa; water level 1.65/1.65 meters below the top of the fuel rods; containment vessel 0.175 MPaabs.
Per IAEA, at 1400 UTC March 31, reactor temperature for Unit 1 Feedwater nozzle has decreased from 281° C to 251 °C. Bottom head temperature is 128° C.
Per NISA, around 17:56 JST 30 March, smoke was rising from the power distribution panel on the first floor of the turbine building of Unit 1. However, when the power supply was turned off, the smoke stopped to generate. It was judged by the fire station at 19:15 that this event was caused by the malfunction of the power distribution panel and was not a fire. (0600, 4/1 SITREP)
Per NISA, as of 14:30 JST 30 March, the Residual Heat Removal System (B) to cool the reactor of Unit 1 became able to receive power from the emergency power supply and the

external power supply, allowing securing of the backup power supplies (emergency power supplies) of Residual Heat Removal System (B) for all units. (0600, 4/1 SITREP)

Per the IAEA at 1400 UTC March 31, no further information was available regarding the plan to commence pumping water into the Unit 1 Spent Fuel Pool by concrete pumping truck from March 29.
No data is available for SFP pool water temperature as of this report.
Previous estimate of fuel rod damage is at 70%. The reactor vessel and primary containment are intact. Unit #1 contains 292 elements.

Fukushima Dai-ichi Unit 2 reactor (NRC priority 2):
According to IAEA, injection of freshwater into the reactor core continues as of 1400 UTC on March 31 through the fire extinguisher line at an indicated rate of 8 m3/h using a temporary electric pump with diesel backup.

As of 1831 27 March, TEPCO reports having switched over to utilizing a temporary electrical pump to inject fresh water into Unit 2, in place of the fire pump that had previously been used.

The dose rate of the containment vessel is 50.7 Sv/h and in the suppression chamber is 1.67 Sv/h.
Per JAIF 0000 JST 1 April, RPV pressure -0.014 MPa; water level 1.50 meters below the top of the fuel rods; containment vessel pressure 0.110 MPaabs.
Per IAEA, at 1400 JST on March 31, reactor temperature readings were 181 °C at the feedwater nozzle and bottom head was not reported.
Per JAIF at 0000 JST 1 April SFP temperature is 49°C.
As of 06:30 30 March, white smoke is generating continuously per NISA.
Per NISA as of 08:30 March 31 JST, pumping of water to the spent fuel pool resumed at 19:05 March 30 until 23:50 March 30.
Per the IAEA as of 1005 UTC on March 31, pumping of water to the spent fuel pool has been restored.
Previous estimate of fuel rod damage is at 33%.

Unit#2 SFP contains 587 elements.

Fukushima Dai-ichi Unit 3 (NRC priority 3)
According to IAEA, injection of freshwater into the reactor core continues as of 1400 UTC on March 31 through the fire extinguisher line at an indicated rate of 7 m3/h using a temporary electric pump with diesel backup.

Per JAIF at 0000 JST 1 April, RPV pressure is 0.016 MPa; reactor water level 1.90 m below the top of the fuel rods; containment vessel pressure 0.1073 MPa;
Per IAEA as of 1400 on March 31, reactor temperature readings were 114 ° C at the bottom head; the feedwater nozzle was under investigation.
As of 06:30 JST 30 March, white smoke is generate continuously per NISA.
No data is available for SFP pool water temperature as of this report.

Fresh water injection to the unit 3 Spent Fuel Pool via the Cooling and Purification Line continues.
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.
Unit #4 SFP contains 1331 elements.
Per the IAEA, freshwater injection to the Spent Fuel Pool using Concrete Pump Truck(50t/h) was complete at 0933 UTC on March 30th.

Fukushima Dai-ichi Unit 5 reactor (NRC priority 5):
Unit 5 was in a refueling outage at the time of the earthquake.
Unit #5 SFP contains 946 elements.
Per NISA as of 06:00 JST March 31: Reactor pressure 0.108 MPa abs, reactor water level 2.216 m above the top of the fuel rods, reactor water temperature is 29.9°C .
Per JAIF at 0200 JST 1 April, the Spent Fuel Pool is being maintained at 35.1°C.
Power was switched to off-site power on March 21.

Fukushima Dai-ichi Unit 6 reactor (NRC priority 6):
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.
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 02:00 JST 1 April Spent fuel pool water temp 24.0°C.
Power supply to Unit 6 was switched from to temporary power to permanent supply on March 25.

Fukushima Daiichi Common Spent Fuel Pool

At 100 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, and the temperature was 39 °C as of 0800 JST 27 March.
The IAEA also reported on March 30th, 2011 that the Common Spent Fuel Pool temperature remains stable.

Other Information

Per the IAEA on 29 March, first analyses were reported in fish carried out by the National Research Institute of Fishery Research. 5 samples of fish were collected from the port of Choshi (Chiba prefecture) and 4 of 5 samples showed Cs-137 concentrations below limit of detection. In one sample Cs-137 was found with 3 Bq/kg (fresh weight) and it was reported that it was slightly above the limit of detection. This concentration is far below any concern for fish consumption. It is still too early to draw conclusions for

expected concentrations on marine food, because the situation may change rapidly; however, it is expected that the detected initial concentrations of seawater will soon drop to lower values by dilution and the levels in marine food will most likely not reach levels above given limits for consumption, (presuming that discharges of contaminated seawater from the reactor will not continue). (0600 March 31 SITREP)

REQUESTS FOR US ASSISTANCE

Japan Logistics Coordinator & Director (NA-47) reported as of 1123AM EDT, March 31, that USG, represented by US Embassy Tokyo, NE, SC, NNSA, Idaho Operations Office, Idaho National Laboratory, and Kansas City Plant participated in a detailed technical exchange via telecom on March 30, 2007 with GOJ (including Diet/House of Representatives, METI, NISA, MOFA, MLIT, MOD, TEPCO, Toshiba, Komatsu, & Taisei):

- TEPCO provided an overview of the current situation and a detailed explanation of the immediate needs for robotics and radiation-hardened cameras for site mapping, survey, and physical investigation of exclusion areas due to elevated radiation levels and automated heavy equipment needs.
- DOE will be providing one specially outfitted TALON robot with radiation sensing capabilities, three additional radiation sensing packages for use on robotic equipment already provided, 5 specialized cameras for radiation environments, associated instructions, and offers of continued technical assistance. Additionally, DOE has provided verbal recommendations to TEPCO/GOJ for direct acquisition of said equipment.
- DOE will be providing a list of technical "leads" for direct communication with their technical leads (US Embassy Energy Attaches will be included) and available studies (and technical advice) regarding shielding of vehicles and equipment for use at Fukushima NPP. (0600, 4/1 SITREP)

ENERGY INFRASTRUCTURE:

No further updates. (0600, April1 SITREP)

On 30 March, NISA issued a press release instructing nuclear plant operating companies to review safety plans and systems to ensure core and spent fuel cooling capability in case of tsunamis and/or station blackout conditions. Operating companies were requested to report on the status of their actions. Per this press release, NISA will verify these plans within one month.

CONTACTS WITH GOJ OFFICIALS:

No further updates (0600, April1 SITREP)

Media Reports

Tokyo, April 1 Kyodo, Tokyo Electric warned for not securing enough dosimeters for workers. http://english.kyodonews.jp/news/2011/04/82534.html

The government's nuclear regulatory agency said Friday it had issued another warning to Tokyo Electric Power Co. over the management of workers' radiation exposure at the crippled Fukushima Daiichi nuclear power plant, after it was found that there were not enough dosimeters to cover all of the workers. Some workers were sharing dosimeters while doing the same job because many of the devices were destroyed in the March 11 quake and tsunami.

TEPCO had been able to secure a total of 420 dosimeters by Thursday, sufficient for each of the workers to wear a device when working at the radiation-leaking site. TEPCO officials said the number of dosimeters available had declined from an initial 5,000 to 320 after the tsunami damaged devices. It had been managing the workers' radiation exposure by ordering the leader of each work team to wear a dosimeter, but some workers had expressed concern about the situation.

Regarding the incident on March 24, it was found that a worker who should have been checking on-site radiation levels was absent and three workers had been engaging in work to lay cables without measuring the radiation dose. According to the Nuclear and Industrial Safety Agency, a total of 21 workers have been exposed to radiation exceeding 100 millisieverts so far during the ongoing crisis at the Fukushima Daiichi plant. Workers are usually permitted to be exposed to up to 100 millisieverts in an emergency situation. The limit, however, has been raised to 250 millisieverts specifically for the work at the plant.

Tokyo, March 31 Kyodo, 1000 bodies of victims to remain buried due to high radiation levels. http://english.kyodonews.jp/news/2011/03/82200.html

Radiation fears have prevented authorities from collecting as many as 1,000 bodies of victims of the March 11 earthquake and tsunami from within the 20-kilometer-radius evacuation zone around the stricken Fukushima nuclear plant, police sources said Thursday. One of the sources said bodies had been "exposed to high levels of radiation after death." The view was supported by the detection Sunday of elevated levels of radiation on a body found in Okuma, Fukushima Prefecture, about 5 km from the Fukushima Daiichi Nuclear Power Station. The authorities are now considering how to collect the bodies, given fears that police officers, doctors and bereaved families may be exposed to radiation in retrieving the radiation-exposed bodies or at morgues, according to the sources. Cremation or conventional burial may be difficult as each method may spread the contamination. Decontamination also creates the possibility of further spread. (1800, 3/31 SITREP)

Tokyo, March 31, Kyodo Groundwater at nuclear plant 'highly' radiation-contaminated. http://english.kyodonews.jp/news/2011/04/82390.html
More signs of serious radiation contamination in and near the Fukushima Daiichi nuclear power plant were detected Thursday, with the latest data finding groundwater containing radioactive iodine 10,000 times the legal threshold and the concentration of radioactive iodine-131 in nearby seawater rising to the highest level yet. The contaminated groundwater was found from around the No. 1 reactor's turbine building, although the radiation level of groundwater is usually so low that it cannot be measured.

Japanese authorities were also urged to consider taking action over radioactive contamination outside the 20-kilometer evacuation zone around the plant, as the IAEA said readings from soil samples collected in the village of Iitate, about 40 km from the plant, exceeded its criteria for evacuation. (1800, 3/31 SITREP)

NHK Summary reported by JAIF as of 0800, March 31.

- The presence of water contaminated by high-level radiation at the Number 1 through Number 3 reactors is hampering work to restore the reactors' cooling systems.
- By Thursday morning, TEPCO had emptied a tank for temporary storage of contaminated water from the turbine building of the No. 3 reactor and started a similar operation at the No.1 reactor. Work is continues to remove contaminated water from tunnels just outside the No. 1 reactor building.
- On Thursday, work began to transfer the water from the tunnel to a storage tank to prevent it from flowing out to sea. TEPCO says that by the day's end (March 31 JST), the water level in the tunnel had been lowered by about one meter.
- TEPCO will install monitoring cameras to track water levels in the tunnels.
- On Thursday, unfavorable weather conditions forced TEPCO to postpone a plan to spray a synthetic chemical on the radioactive debris scattered on the grounds of the plant as a result of a series of explosions at the plant in mid-March. TEPCO is hoping that the adhesive chemical will prevent the radioactive dust from being carried away by winds. (1800, 3/31 SITREP)

Tokyo, March 31, Kyodo. **Radioactive substance exceeding limit found in beef in Fukushima Pref.** http://english.kyodonews.jp/news/2011/04/82389.html

The health ministry said Thursday that beef in Fukushima Prefecture, where the crippled nuclear power plant is located, contained a radioactive material exceeding the legal limit, making it the first such detection in beef. The Ministry of Health, Labor and Welfare said 510 becquerels of radioactive cesium was detected in beef from Tenei, Fukushima Prefecture, above the 500-becquerel legal limit set under the food sanitation law. But an official for the Nuclear and Industrial Safety Agency said in Fukushima early Friday that it will conduct a fresh examination on beef, citing a significant gap in radiation levels between the sample taken in Tenei and other meat samples. Tenei is located nearly 70 kilometers away from the Fukushima Daiichi nuclear power plant (1800, 3/31 SITREP)

CONTACT INFORMATION:
Nuclear Incident Team in the Emergency Operations Center

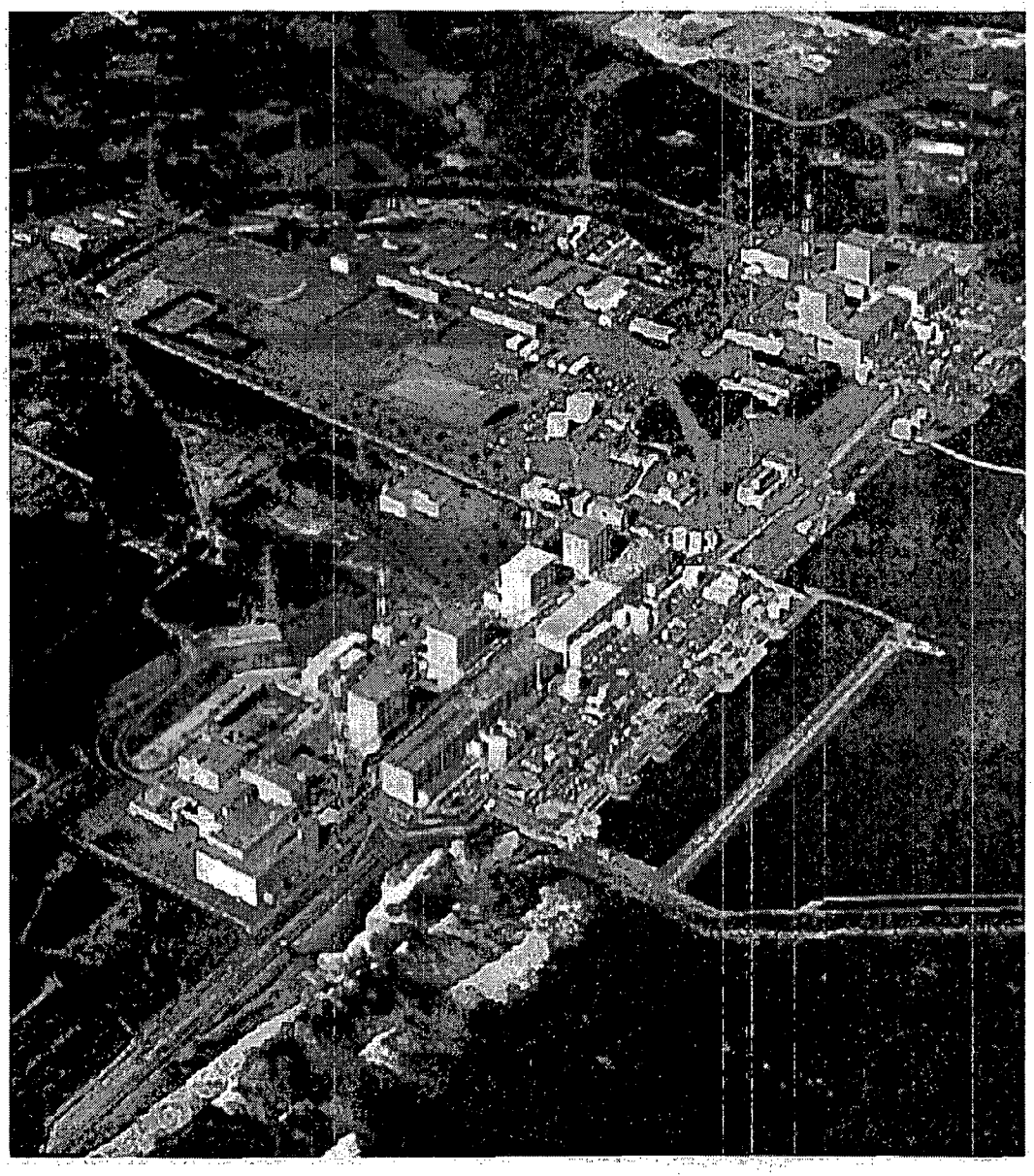
(b)(6)

Office of the Deputy Secretary 202-586-5500

Watch Schedule April 1:

Mark Whitney Michael Worley	0400-0800/1 April
John Gerrard Rich Reister	1600-2000/1 April
Alex Sunshine Craig Welling	0400-0800/2 April

Japan Earthquake Response
April 1, 2011 // 0600 EDT



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Contact: DOE/NNSA Nuclear Incident Team:

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Current Status

- **No major changes in radiation levels at the Fukushima Daiichi Nuclear Power Plant**
- **Additional power plant status in accompanying text SITREP**
  - Unit 1: Reactor water level stable, core damage est. 70%. Freshwater injection continues. Electrical power line connected. Pumping freshwater slowed due to limited capacity to handle discharge.
  - Unit 2: Reactor water level stable, core damage est. 33%. Spent fuel pool has been filled however fresh water injection has been suspended. TEPCO reports having switched over to a temporary electrical pump to inject fresh water into Unit 2, in place of the fire pump that had previously been used.
  - Unit 3: Freshwater injection continues; trucks pumping water into spent fuel pools. Reactor water level 1.9 m (A) 2.3 m (B) below the top of the fuel rods.
  - Unit 4: Spraying continues periodically for the spent fuel pool. Power restored. Trucks pumping water into spent fuel pool.
- TEPCO continues to address issues with water in the trenches outside the turbine buildings of Units 1, 2 and 3
  - The Nuclear Safety Commission of Japan suggests that higher activity in the water discovered in the Unit 2 turbine building is supposed to be caused by water, which has been in contact with molten fuel rods for a time and directly released into the turbine building via some, as yet unidentified, path
- Voluntary evacuation zone extended to 30km from Fukushima Daiichi.

DOE/NNSA 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 Monitoring 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 (40)

Yokota AB

(1) SEO
(1) SEO Staff
(24) CMRT
(9) AMS

US Embassy Tokyo

(3) DART LNO
(1) Nuclear Energy Representative

USPACOM HQ

(1) LNO

Upcoming personnel changes:

5 personnel scheduled to deploy to Japan April 1, 2011

3 personnel scheduled to deploy to Japan April 2, 2011

Mission Summary

Type	Last 12 Hours	Total
AMS Flight Hours	19	175
Field Measurements	6,478	44,994

Field measurements are a combination of DOE, DoD, and GOJ data including automated downloads from several remotely monitored stations. Figures accurate as of 0400 EDT 1 APR 11.

Significant Events: Past 24 Hrs.

International Engagement:

- Met with MEXT to discuss:
  - Joint monitoring and sampling priorities
  - Sharing data
  - Technical cooperation
- Major General Bonsho visit to DOE team at Yokota cancelled
- Coordinated with MHLW on drinking water screening
- GOJ ministries requested support for sample analysis of food, soil, and water. Support will require sensitive detectors (High Purity Germanium), support equipment, and training.
- Received request from the Japanese Government to assist in plume/dose reconstruction of impacted population

Nuclear Incident Team:

- Released shape files for use by NGA and USGS
- Provided ground monitoring and aerial measuring data spreadsheets to CDC, FDA, HHS, USDA, EPA, NRC, DHS, NR, and WH
- Technical review of Draft Reentry Guidance
- Posted updated radiological assessment to DOE webpage

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
  - Continued monitoring activities at the US Embassy Japan
    - AMS UH-1: Flew the southern half of Tohoku Expressway south of Kortyama to the hills north of Kurolso to complete planned mission from 3/30.
    - AMS HH-60: Flew the southern half Tohoku Expressway north of Kortyama to the north side of Fukushima to complete planned mission from 3/30.
    - AMS C-12: Flew the metro area of north Tokyo across the valley flying east to west at the request of GOJ.
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    - One ground team traveled to Yokuska to collect the air sample.
  - Triage analysis of Air filters for US Embassy and Harris Towers complete
- Medical Consult
  - Responded to RFI on bioassay for U.S. workers deployed to Japan

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

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)

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.

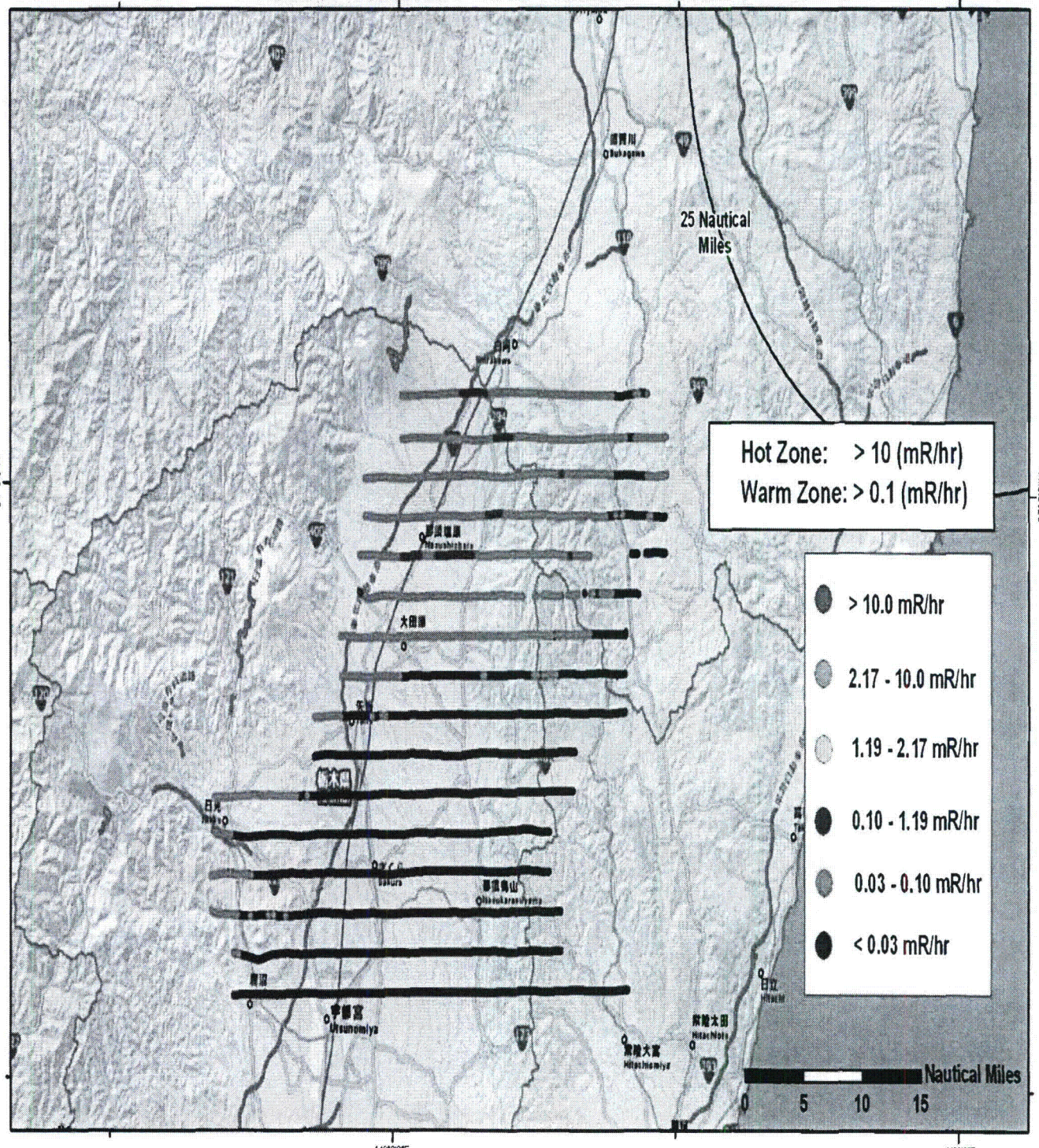
- Areas 10 to 100 times historical background are indicated by green.
- Areas 2 to 10 times historical background are indicated by light blue.
- Areas at or near historical background are indicated by dark blue.

Aerial Monitoring Results

C-12 Flight (March 30, 2011)

FUKUSHIMA DAIICHI
JAPAN

National Nuclear Security Administration



Map created on 03302011 2340 JST

Name: CMOC C-12 30Mar2011 Flight 1 Results

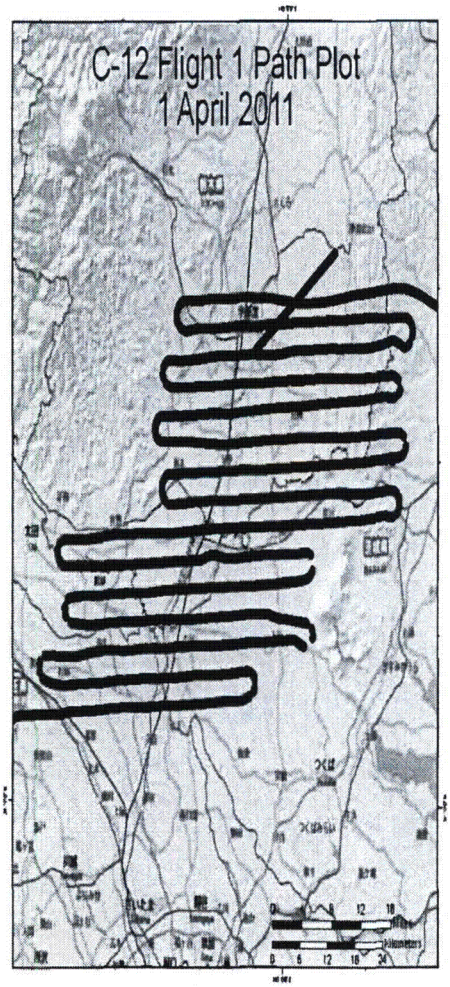
~~Official Use Only~~

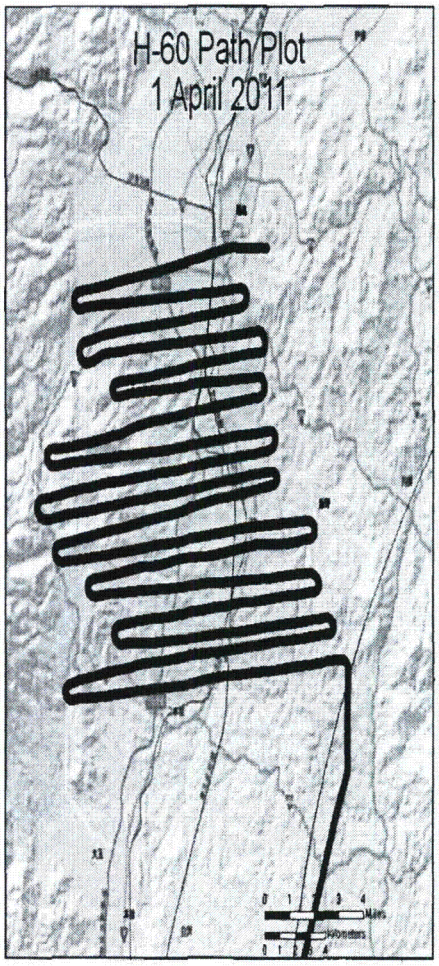
~~Official Use Only~~

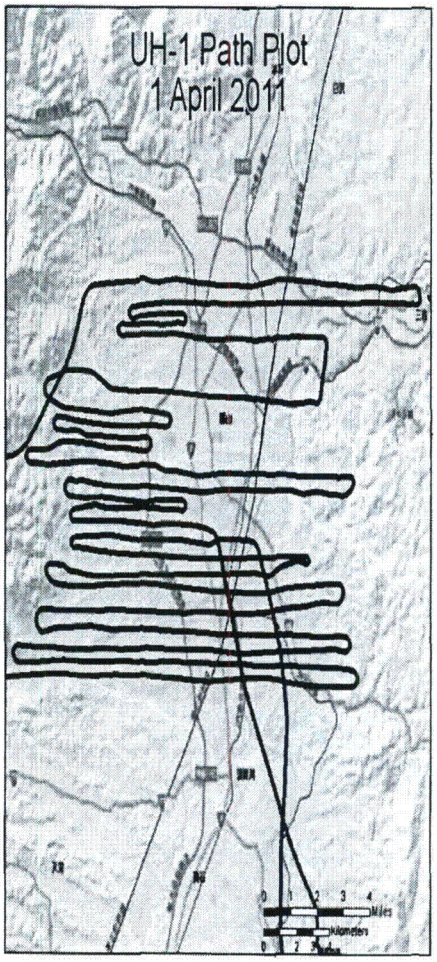
Nuclear Incident Team DOE NIT
Contact (b)(6)

1 Apr 2011 Flights

Data Assessment Pending



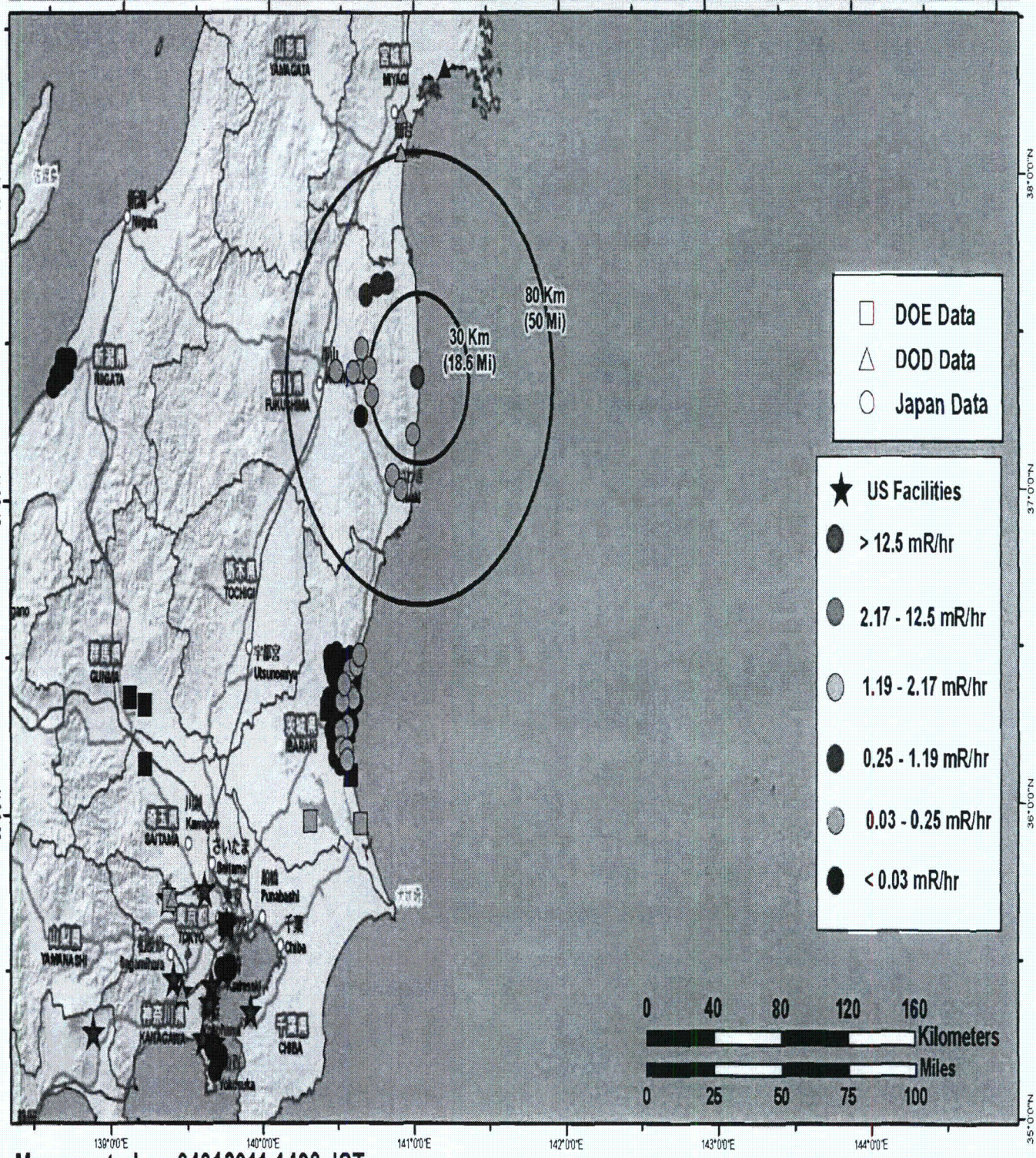




Field Monitoring Results

March 31 13:00 to April 1 13:00 JST

FUKUSHIMA DAIICHI
JAPAN



Map created on 04012011 1430 JST

Name: NIT 24hrsMonitoringResults 31Mar2011 1300

~~UNCLASSIFIED~~

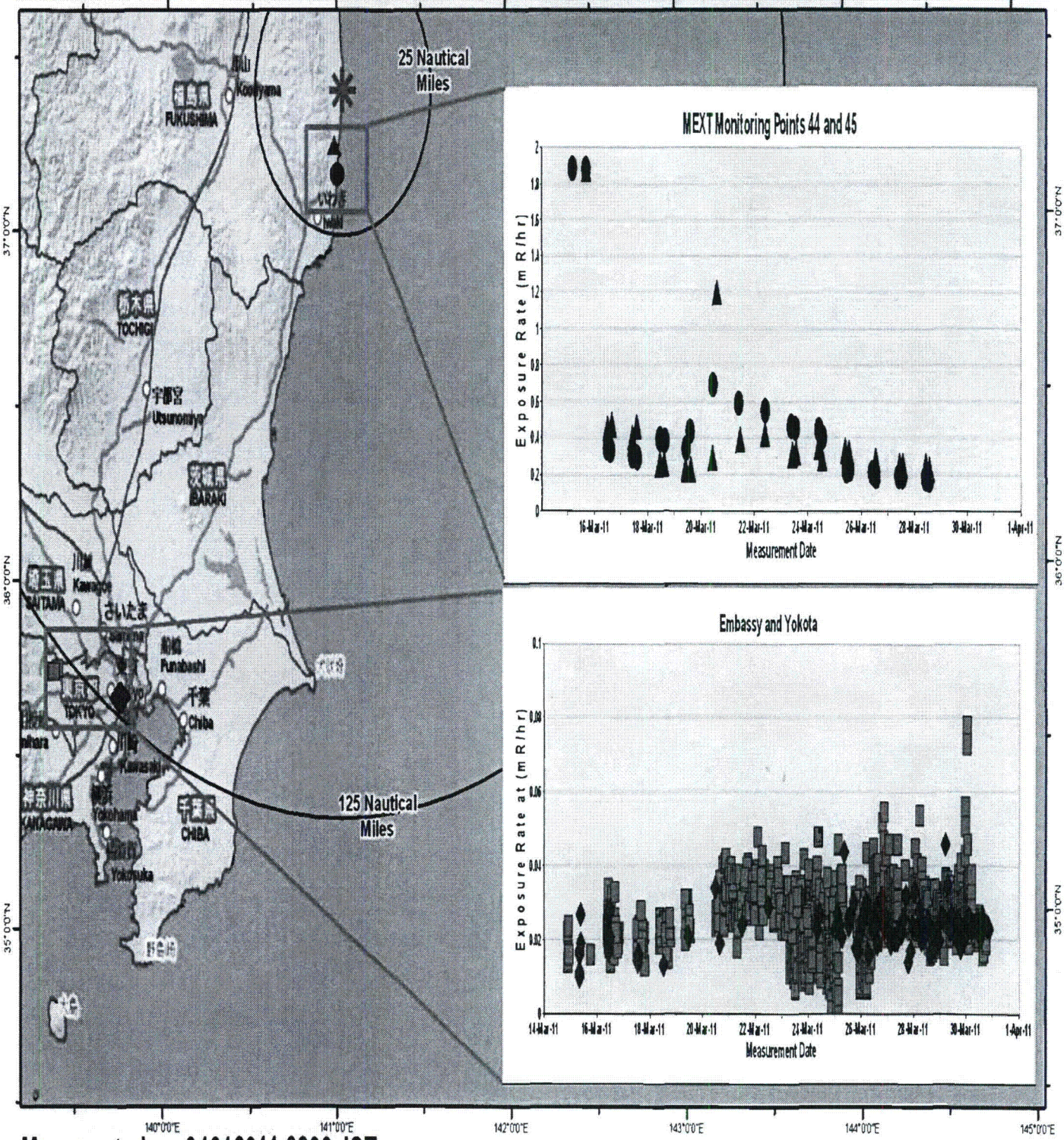
Nuclear Incident Team DOE NIT

Contact (b)(6)

Exposure Trend Plot
Extending South to Yokota AB

FUKUSHIMA DAIICHI
JAPAN

National Nuclear Security Administration



Map created on 04012011 0200 JST

Name: CMHT MonTrend 31Mar2011 South

~~UNCLASSIFIED~~

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

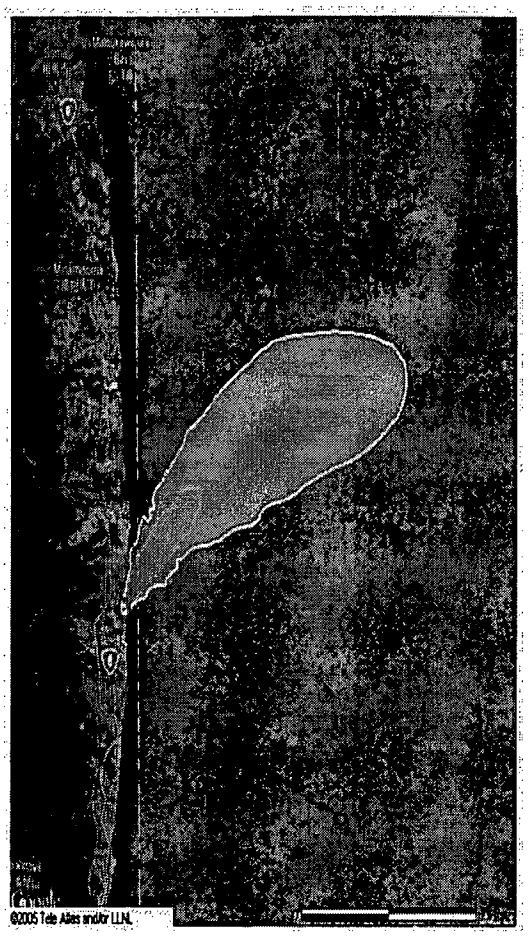
Aerial and Ground Monitoring Data Assessment

Assessment:

- An assessment of measurements gathered through 01 April continue to show:
  - Radiation levels consistently below actionable levels for evacuation or relocation outside of 25 miles.
  - Radiological material has not deposited in significant quantities in the areas measured since 19 March

Forecasted Weather April 1 to April 2

04/02/2011 05:00:00 JST



Planned Operations: Next 24 Hrs

- Aerial Monitoring
  - AMS UH-1: Fly approximately 50-65 NM west of the plant at 500 ft AGl at 2000 ft line spacing.
  - AMS HH-60: Fly approximately 55-70 NM west/southwest of the plant at 500 ft AGl at 2000 ft line spacing.
  - AMS C-12: Fly approximately 20-40 NM west of the plant.
- Ground Monitoring
  - TBD
  - One ground team will travel to Yokosuka to collect air samples
  - When approved: Coordinate with AFRAT to insert 8 DOE "Infield" radiation search systems for use as Distance Early Warning line.
- Continue joint Monitoring and Assessment planning with DoD (US AFRAT).

DEPARTMENT OF ENERGY SITUATION REPORT
Earthquake & Tsunami in Japan
1 April 2011
1800 (EDT) UPDATE

POWER PLANT UPDATE AND OTHER NUCLEAR ISSUES

Summary of information received as of 1800 (EDT) 1 April from the NRC, Embassy-Tokyo, IAEA Incident and Emergency Center, TEPCO, METI, NISA, Japan Atomic Industrial Forum, Nuclear Energy Institute, and media outlets. (NOTE: JST = EDT + 13 hours; EDT = GMT/UTC – 4 hours).

Note: With the 1800 March 31 SITREP we started labeling each entry 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.

Updates on Reactor Vessel Integrity:

Per JAIF as of 0300 EDT April 1, it is presumed that radioactive material inside the reactor vessel may have leaked outside Units 1, 2 and 3. NISA announced that the reactor pressure vessel of Units 2 and 3 may have lost air tightness judging from the low pressure inside the pressure vessel. NISA reports that it is unlikely that these are cracks or holes in the reactor pressure vessels. (0600, 4/1 SITREP)

Updates on Cooling Efforts and Cooling Water Management:

The IAEA reported at 1430 UTC, April 1:

- The **Unit 1** condenser is full. In preparation for transferring water in the basement of the turbine building to the condenser, water in the condenser storage tank is being transferred to the suppression pool surge tank since 31 March, 03:00 UTC. Water in the trench was transferred to a water tank at the central environmental facility process main building. In order to prepare for removal of the water from the turbine building basement in **Unit 2**, pumping of water from the condenser to the suppression pool water surge tank started at 07:45 UTC 29 March. For **Unit 3** pumping of water from the condenser to suppression pool water surge tank was started at 08:40 UTC March 28 and was completed at 23:37 UTC on 30 March. (1800, 4/1 SITREP)
- Per IAEA as of 1000 EDT March 31, pumping of water from the Unit 1 turbine building has been stopped. Per NEI as of March 31, workers finished pumping water from Unit 3 turbine building and had started pumping contaminated water from the Unit 2 turbine building into a storage tank. (1800, 3/31 SITREP)

AR/3

- Per JAIF as of 0643 EDT, March 31, work began to transfer water from Unit 1 tunnel to a storage tank to prevent it from flowing out to sea. (1800, 3/31 SITREP)
- For **Unit 1** fresh water has been continuously injected into the Reactor Pressure Vessel (RPV) through the feed-water line at an indicated flow rate of 8 m3/h using a temporary electric pump with diesel backup. In **Unit 2** fresh water is injected continuously through the fire extinguisher line at an indicated rate of 8 m3/h using a temporary electric pump with diesel backup. In **Unit 3** fresh water is being injected continuously at about 7 m3/h into the reactor core through the fire extinguisher line using a temporary electric pump with diesel backup.
- The pumping of water into the **Unit 1** Spent Fuel Pool by concrete pumping truck was started at 04:03 UTC on 31 March. Fresh water was sprayed to the spent fuel pool at the **Unit 3** by the concrete pump on 31 March and to the spent fuel pool on **Unit 4** on the 1st April (1800, 4/1 SITREP)

NHK reports on April 1, Tepco emptied the No.2 reactor's condensate storage tank, with the same task at the No.1 reactor due to finish soon after. (1800, 4/1 SITREP)

JAIF reports that, as of 0300 EDT April 1:

- "Steam-like substance" rose intermittently from the reactor building at Units 1, 2, 3 and 4 – spent fuel pools suspected source. Injecting and/or spraying water to the spent fuel pool has been conducted.
- Water injection to the reactor pressure vessel by temporally installed pumps was switched from seawater to freshwater at Units 1, 2 and 3.
- High radiation circumstance hampering the work to restore originally installed pumps for injection. Discharging radioactive water in the basement of the buildings of Units 1, 2, and 3 continue to improve this situation. (0600, 4/1 SITREP)

NHK reports April 1 1925 JST the barge provided by the US Navy is preparing to pump large volumes of fresh water by hose to a water tank near the No.1 reactor. Near the No.4 reactor, 400 liters of a synthetic resin solution were sprayed in an experiment intended to solidify contaminated dust and prevent radioactive materials from getting airborne. Plant operator Tokyo Electric Power Company is due to test the solution for about 2 weeks to see if it works. (1800, 4/1 SITREP)

On April 1, the Kyodo News reports the barge contains 300,000 gallons of fresh water and is now moored at the Daiichi power station, while another ship carrying an additional 200,000 gallons is expected to arrive later Friday. (0600, 4/1 SITREP)

World Nuclear News reports Tepco plans to construct a 6000 tonne water tank as well as a 4000 tonne pond. These will work in conjunction with a 20 tonne per hour treatment facility to handle water from drainage canals around all six reactors at the plant. The tank and pond should be complete around the middle of this month, with the treatment facility following about two weeks later. The set-up should let the company

mitigate the discharges to sea by safely storing and sampling the water and only discharging it after treatment. (1800, 4/1 SITREP)

The NRC reported that as of 0430 EDT March 31 one train of temporary cooling equipment had been transported to Yokota Air Force Base and that two fresh water barges from the US Navy were en route to the Daiichi site. (1800. 3/31 SITREP)

Updates on Electrical Power Restoration Efforts:

No updates since 0600 March 29 SITREP. Power distribution panels (Power Centre) in Units 2 and 4 connected to the off-site electrical supply; lighting in units 1, 2 and 3 control rooms restored; some instrumentation recovered for units 1, 2 and 4 with individual components are still being checked prior to being energized. (0600, 4/1 SITREP)

Updates on Injuries and Exposure of Daiichi Workers:

JAIF is reporting at 0930 EDT April 1 that Japan's nuclear safety agency has reprimanded TEPCO over its failure to ensure the safety of workers at the Fukushima Daiichi nuclear power plant due to shortages of radiation monitors. Some teams of workers had to share a radiation monitor, although they are supposed to have one each. Many monitors stopped working after the massive quake. The agency told reporters on Friday that the practice is problematic. It instructed the plant operator to make sure that workers are able to check radiation levels. TEPCO told the agency that it has obtained 420 radiation monitors so far. The company explained that work will be suspended if employees do not have their own monitors. (1800, 4/1 SITREP)

In an earlier April 1 update, JAIF also reports that TEPCO may postpone low priority work at the damaged Fukushima Daiichi nuclear plant to ensure radiation monitoring for workers. TEPCO said on Thursday that the quake destroyed many radiation monitors and that only 320 out of the 5,000 it had prior to the disaster are now available. The company said that in some work groups only leaders had monitors and that 180 workers had worked without devices on one day. TEPCO said it may postpone low priority work so no employee has to work without a device. It also said it will collect radiation monitors from other plants to minimize delays. (1800, 4/1 SITREP)

The IAEA reported at 1400 EDT, March 31 that NISA had reported 20 workers at the Fukushima Daiichi plant had received in excess of 100 mSv (10 Rem). (0600, 4/1 SITREP)

JAIF reports that as of 0300 EDT April 1, there is a plan to spray synthetic resin to contain contaminated dust. (0600, 4/1 SITREP)

Radiation Detection Updates:

From the IAEA website on April 1, deposition of iodine-131 was detected by the Japanese authorities on March 31 in 8 prefectures, and deposition of cesium-137 in 10 prefectures. In these prefectures where deposition of iodine-131 was reported, on 31 March, the range was from 29 to 1350 becquerel per square metre. For cesium-137, the range was from 3.6 to 505 becquerel per square metre. In the Shinjyuku district of Tokyo, the daily deposition for iodine-131 was 50 becquerel per square metre and for cesium-137 it was 68 becquerel per square metre. No significant changes were reported in the 45 prefectures in gamma dose rates compared to yesterday. As of 28 March, recommendations for restrictions on drinking water are in place at two locations in the Fukushima prefecture and restrictions continue to apply for infants only. The IAEA monitoring team made additional measurements at 9 locations West of Fukushima-Daiichi NPP. The measurement locations were at distances of 30 to 58 km from the Fukushima nuclear power plant. The dose rates ranged from 0.4 to 2.3 microsievert per hour. At the same locations, results of beta-gamma contamination measurements ranged from 0.01 to 0.49 Megabecquerel per square metre. The other team who had made monitoring measurements in Tokyo during the last week, has finished its activities. Significant data related to food contamination was reported on 31 March by the Japanese Ministry of Health, Labour and Welfare. Reported analytical results covered 2 samples taken on 15 March and 109 samples from 27-31 March. Analytical results for 98 of the 111 samples for various vegetables, spinach and other leafy vegetables, fruit (strawberry), seafood, various meats (beef, chicken and pork) and unprocessed raw milk in eight prefectures (Chiba, Fukushima, Gunma, Ibaraki, Kanagawa, Niigata, Tochigi, and Tokyo), indicated that iodine-131, caesium-134 and caesium-137 were either not detected or were below the regulation values set by the Japanese authorities. However, it was reported that analytical results in Chiba, Fukushima, Ibaraki and Tochigi prefectures for the remaining 13 of the total 111 samples for spinach and other leafy vegetables, parsley and beef indicated that iodine-131 and/or caesium-134 and caesium-137 exceeded the regulation values set by the Japanese authorities. (1800, 4/1 SITREP)

JAIF reported as of 2100 JST April 1:

- Radiation levels were 0.91mSv/h at the south side of the office building, 144μSv/h at the Main gate, 65μSv/h at the West gate as of 1500 JST April 1. (1800, 4/1 SITREP)
- 4.8μSv/h at the border of the nuclear power plant at 2000 March 31. (0600, 4/1 SITREP)

The IAEA reported as of 1000 EDT on March 31 new results from the marine monitoring stations 30 km off-shore for 28 March.

- A decrease for the northernmost sampling station for I-131 and a slight increase for Cs-137 as compared to values measured on 27 March.
- For sampling points situated towards the south of the transect an increase both for I-131 and for Cs-137 as compared to the previous day, with maximum concentrations in water below 30 Bq/l and 20 Bq/l respectively, still considerably lower than the maxima recorded on 23 March (correlates with trends in concentrations measured close to the discharge points).

- The latest analyses in seawater 330 m south of the discharge point of NPP Units 1-4, and 30 m north of the discharge point of Units 5-6 were made available for 29 March with readings of 130 000 Bq/l of I-131, 32 000 Bq/l of Cs-137 and 31 000 Bq/l of Cs-134 were reported near Units 1 - 4. (1800, 3/31 SITREP)

JAIF reported as of 0800 March 31:

- The radiation dose was higher than 1000 mSv at the surface of water accumulated on the basement of Unit 2 turbine building and in the tunnel for laying piping outside the building on March 27.
- Plutonium was detected from the soil of the Fukushima Daiichi NPS site on Mar. 28th. The concentration of plutonium measured is as little as in normal environment, almost the same as measured in Japan when the nuclear bomb tests were conducted in the atmosphere in the past, and not harmful to human body.
- Radioactive materials exceeding the regulatory limit had been detected from seawater samples collected in the sea surrounding the Fukushima Dai-ichi NPS since March 21. Radioactive Iodine, I-131, with 4,385 times higher than regulatory limit detected on March 30. (1800, 3/31SITREP)

JAIF reported as of 0800, March 31 that radioactive material in milk and agricultural products from Fukushima and neighboring prefectures. GOJ issued orders to limit shipment and intake for some products. Radioactive iodine exceeding the provisional legal limit was detected from tap water sampled in some prefectures from March 21 to 27. GOJ advised not to drink the water in those regions, then lifted the advice on March 28 except for four cities and villages in Fukushima prefecture. (1800, 3/31 SITREP) By Mar. 31, advice was lifted for all regions except for one city and a village in Fukushima prefecture. (0600, 4/1 SITREP)

JAIF reported as of 0800, March 31 that the IAEA reported radiation levels twice as high as its criterion for evacuation in a village 40 kilometers from Fukushima Daiichi, outside the 20 kilometer exclusion zone and the 20-to-30 kilometer alert zone where DOJ has advised voluntary evacuation. The IAEA said its experts measured levels of I131 and Cs137 in soil around the plant between March 18th and 26th. It said measurements in Iitate Village, 40 kilometers northwest of the Fukushima plant, were double the IAEA operational criteria for evacuation and that it had advised DOJ to carefully assess the situation. In Tokyo on Thursday, Japan's Chief Cabinet Secretary Yukio Edano told reporters the reported radiation levels in Iitate will not have an immediate impact on human health but could be harmful if exposed over a long period of time. He said the government will closely assess the long-term impact and take appropriate action. (1800, 3/31 SITREP)

On 31 March, Kyodo news reported that radioactive iodine-131 at a concentration of 4,385 times the maximum level permitted under law has been detected in seawater near the plant. In addition, Japanese authorities were also urged to consider taking action over radioactive contamination outside the 20-kilometer evacuation zone around the plant, as the International Atomic Energy Agency said readings from soil samples collected in the

village of Iitate, about 40 km from the plant, exceeded its criteria for evacuation. (0600 3/31 SITREP)

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

Recent events of past 24 hours:

Modeling

- NARAC: Continued work on products normalizing NARAC models to measurements taken in the field. Preliminary assessment of release from Unit 2 resulting in deposition extending to the Northwest. Further assessment of dose rate measurements correlated to plume passage ongoing.

Field Monitoring and Assessment

- Continued monitoring activities at the US Embassy Japan
  - AMS UH-1: Flew the southern half of Tohoku Expressway south of Kortyama to the hills north of Kurolso to complete planned mission from 3/30.
  - AMS HH-60: Flew the southern half Tohoku Expressway north of Kortyama to the north side of Fukushima to complete planned mission from 3/30.
  - AMS C-12: Flew the metro area of north Tokyo across the valley flying east to west at the request of GOJ.
  - One ground team drove out to the east side of Tokyo Bay to Choshi, drive up the coast to the Tokai NPP then return. Teams conducted beta/gamma surveys, in-situ gamma spec and low-volume air sample for particulate/iodine.
  - One ground team traveled to Yokuska to collect the air sample.
- Triage analysis of Air filters for US Embassy and Harris Towers complete.

Medical Consult

- Responded to RFI on bioassay for U.S. workers deployed to Japan

Planned operations over the next 24 hours:

- Aerial Monitoring
  - 3 flights in areas to be determined
- Ground Monitoring
  - TBD
  - When approved: Coordinate with AFRAT to insert 8 DOE "Infield" radiation search systems for use as Distance Early Warning line.
- Continue joint Monitoring and Assessment planning with DoD (US AFRAT).

Updates by Reactor Unit (Updated each SITREP)

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

According to the IAEA, the Unit 1 condenser is full. In preparation for transferring water in the basement to the condenser, water is being pumped from the condenser to the suppression pool surge tank. Water in the trench was transferred to a water tank at the central environmental facility process main building. (1800, 4/1 SITREP)

According to the IAEA, injection of freshwater into the reactor core continues as of April 1 1430 UTC through a feed water line at an indicated flow rate of 8.0 m3/h using a temporary electric pump with diesel backup. Pumping of water into the Unit 1 spent fuel pool was started on March 31 at 0403 UTC. (1800, 4/1 SITREP)

Per JAIF at 0600 JST 1 April, reactor parameters are: RPV pressure (A)0.293MPaG, (B)0.495 MPaG; water level 1.60/1.60 meters below the top of the fuel rods; containment vessel 0.170MPaabs; RPV feedwater nozzle 252.2 °C. March 31, 1130 JST water level in trench is 1.14m below floor level. (1800, 4/1 SITREP)

Per NISA, around 17:56 JST 30 March, smoke was rising from the power distribution panel on the first floor of the turbine building of Unit 1. However, when the power supply was turned off, the smoke stopped to generate. It was judged by the fire station at 19:15 that this event was caused by the malfunction of the power distribution panel and was not a fire. (0600, 4/1 SITREP)

Per NISA, as of 14:30 JST 30 March, the Residual Heat Removal System (B) to cool the reactor of Unit 1 became able to receive power from the emergency power supply and the external power supply, allowing securing of the backup power supplies (emergency power supplies) of Residual Heat Removal System (B) for all units. (0600, 4/1 SITREP)

No data is available for SFP pool water temperature as of this report.

Unit #1 contains 292 elements.

On March 24, the NRC estimated (for source term and release rate calculations) that Unit 1 had 70% core melt and a 10% release rate/day as provided by the Japanese. (1800, 4/1 SITREP)

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

According to the IAEA, pumping of water from the condenser to the suppression pool water surge tank started on March 30 at 0745 UTC. (1800, 4/1 SITREP)

According to the IAEA, injection of freshwater into the Reactor Pressure Vessel (RPV) through the feed water line continues as of April 1, 1430 UTC through the fire extinguisher line at an indicated rate of 8 m3/h using a temporary electric pump with diesel backup. Indicated temperature at the feed water nozzle of the RPV is stable at 165°C and bottom head is not reported. Indicated drywell pressure remains at atmospheric pressure. (1800, 4/1 SITREP)

Per JAIF 0600 JST 1 April, RPV pressure (A)-0.014 MPaG (B)-0.016 MPaG; water level 1.50 meters below the top of the fuel rods; containment vessel pressure 0.110 MPaabs. On April 29, 1500 JST, water level in the trench is 1.04 meters below floor level. Per JAIF at 0600 JST 1 April SFP temperature is 48°C. (1800, 4/1 SITREP)

As of 06:30 30 March, white smoke is generating continuously per NISA.

Per NISA as of 08:30 March 31 JST, pumping of water to the spent fuel pool resumed at 19:05 March 30 until 23:50 March 30.

On March 24, the NRC estimated (for source term and release rate calculations) that Unit 2 had 33% core melt and a 5 inch hole in containment based on Japanese report. (1800, 4/1 SITREP)

Unit#2 SFP contains 587 elements.

Fukushima Dai-ichi Unit 3 (NRC priority 3)

According to the IAEA, pumping of water from the condenser to suppression pool water surge tank was completed on March 30 at 2337 UTC. (1800, 4/1 SITREP)

According to the IAEA, injection of freshwater into the reactor core continues as of April 1, 1430 UTC through the fire extinguisher line at an indicated rate of about 7 m3/h using a temporary electric pump with diesel backup. Indicated temperature of the RPV feed water nozzle is stable at 112 ° C. Indicated drywell pressure remains slightly above atmospheric pressure. Fresh water was sprayed into the spent fuel pool of Unit 3 by concrete pump on 31 March. (1800, 4/1 SITREP)

Per JAIF at 0545 JST 1 April, RPV pressure is (A) 0.016 MPaG (B) -0.086MPaG; reactor water level is (A) 1.90m (B) 2.25m below the top of the fuel rods; containment vessel pressure 0.1071 MPaabs. March 29, 1500 JST, water level in trench is 1.55m below floor level. (1800, 4/1 SITREP)

As of 06:30 JST 30 March, white smoke is generate continuously per NISA.
No data is available for SFP pool water temperature as of this report.
Fresh water injection to the unit 3 Spent Fuel Pool via the Cooling and Purification Line continues.

On March 24, the NRC estimated (for source term and release rate calculations) that Unit 3 had 33% core melt and a 100% release rate/day based upon data provided by the Japanese. (1800, 4/1 SITREP)

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.
Unit #4 SFP contains 1331 elements.
Per the IAEA, freshwater injection to the Spent Fuel Pool using Concrete Pump Truck was being conducted on April 1. (1800, 4/1 SITREP)

Fukushima Dai-ichi Unit 5 reactor (NRC priority 5):
Unit 5 was in a refueling outage at the time of the earthquake.
Unit #5 SFP contains 946 elements.
Per NISA as of 06:00 JST March 31: Reactor pressure 0.108 MPa abs, reactor water level 2.216 m above the top of the fuel rods, reactor water temperature is 29.9°C .
Per JAIF at 0200 JST 1 April, the Spent Fuel Pool is being maintained at 35.1°C.
Power was switched to off-site power on March 21.

Fukushima Dai-ichi Unit 6 reactor (NRC priority 6):
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.
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 02:00 JST 1 April Spent fuel pool water temp 24.0°C.
Power supply to Unit 6 was switched from to temporary power to permanent supply on March 25.

Fukushima Daiichi Common Spent Fuel Pool

At 100 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, and the temperature was 39 °C as of 0800 JST 27 March.
The IAEA also reported on March 30th, 2011 that the Common Spent Fuel Pool temperature remains stable.

Other Information

The IAEA has announced that it will hold a high-level conference on preliminary lessons learned from Fukushima on June 20-24, 2011. Information is available at www.iaea.org.

REQUESTS FOR US ASSISTANCE

The GOJ has requested assistance from DOE in the handling and storage of contaminated water from at the Fukushima reactors. Secretary Chu has offered to provide equipment and capabilities at DOE sites to support the Fukushima water clean-up effort. TEPCO said they hope they can receive the six stainless steel horizontal storage tanks (16,000 gallons each) and high activity trailer (1000 gallon capacity) as soon as possible. Capabilities include existing pumps and storage tanks that can be deployed quickly, as

well as resources that can be utilized to design and acquire systems for the safe handling and storage of contaminated water. (1800, 4/1 SITREP)

Japan Logistics Coordinator & Director (NA-47) reported as of 1123AM EDT, March 31, that USG, represented by US Embassy Tokyo, NE, SC, NNSA, Idaho Operations Office, Idaho National Laboratory, and Kansas City Plant participated in a detailed technical exchange via telecom on March 30, 2007 with GOJ (including Diet/House of Representatives, METI, NISA, MOFA, MLIT, MOD, TEPCO, Toshiba, Komatsu, & Taisei).

- TEPCO provided an overview of the current situation and a detailed explanation of the immediate needs for robotics and radiation-hardened cameras for site mapping, survey, and physical investigation of exclusion areas due to elevated radiation levels and automated heavy equipment needs.
- DOE will be providing one specially outfitted TALON robot with radiation sensing capabilities, three additional radiation sensing packages for use on robotic equipment already provided, 5 specialized cameras for radiation environments, associated instructions, and offers of continued technical assistance. Additionally, DOE has provided verbal recommendations to TEPCO/GOJ for direct acquisition of said equipment.
- DOE will be providing a list of technical "leads" for direct communication with their technical leads (US Embassy Energy Attaches will be included) and available studies (and technical advice) regarding shielding of vehicles and equipment for use at Fukushima NPP. (0600, 4/1 SITREP)

ENERGY INFRASTRUCTURE:

No further updates. (1800, April1 SITREP)

On 30 March, NISA issued a press release instructing nuclear plant operating companies to review safety plans and systems to ensure core and spent fuel cooling capability in case of tsunamis and/or station blackout conditions. Operating companies were requested to report on the status of their actions. Per this press release, NISA will verify these plans within one month.

CONTACTS WITH GOJ OFFICIALS:

An interagency group will be meeting on Monday, April 4 at 1900 JST with U.S. Embassy officials, DOE and NRC. Participants will include 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 include representatives from TEPCO, NISA, METI, MEXT, JSDF and the Nuclear Safety Commission. (1800, 4/1 SITREP)

Media Reports

Nuclear Energy Institute Update as of 12:30 EDT April 1:

http://www.nei.org/newsandevents/information-on-the-japanese-earthquake-and-reactors-in-that-region/
Japan's nuclear safety agency has reprimanded **Tokyo Electric Power Co.** for not providing radiation monitors to all emergency workers at the Fukushima Daiichi nuclear power plant. Each worker is supposed to have an individual radiation monitor, but some emergency teams have had to share monitors, the **Japan Atomic Industrial Forum** reported. TEPCO said that low-priority work will be suspended if employees do not have monitors. TEPCO said that only 320 of the 5,000 radiation monitors were available after the earthquake and tsunami, JAIF said.

Radiation Found in Beef
Radiation that exceeds safety standards has been found in beef in Fukushima and three neighboring prefectures, JAIF reported. Radiation also was found in spinach and other vegetables grown in the area. Japan's health ministry said the beef and vegetables have not been shipped and are not on the market.

Fukushima Daiichi
A U.S. Navy barge containing freshwater to cool the reactors and used fuel pools at the Daiichi site has been towed to the pier. It will be connected to the pumps with hoses. Meanwhile, injection of freshwater continues at reactors 1-3 and workers continue to spray freshwater on the used fuel pools for reactors 1-4. TEPCO is evaluating the use of a synthetic resin that would be sprayed over debris at the site to prevent the spread of radioactive dust. Additional equipment, including the biggest concrete pump in the world, is being provided by U.S. companies. The pump's 70-meter boom can be controlled remotely. It has been in use at the **Savannah River Site**, helping build a U.S. government mixed oxide nuclear fuel plant. Concrete pumps are already in use at the site to assist with spraying water into the used fuel pools.

Japan PM vows funding to tackle long nuclear crisis
http://www.reuters.com/article/2011/04/01/us-japan-quake-idUSTRE72A0SS20110401?pageNumber=2

TOKYO (Reuters) - Japanese Prime Minister Naoto Kan said on Friday he was ready for a long fight to bring a quake-hit nuclear plant under control but was convinced Japan would overcome the world's worst nuclear crisis since the Chernobyl disaster in 1986. "I am prepared for a long-term battle over the Fukushima nuclear plant and to win this battle," he said in a nationally broadcast news conference as the country marked three weeks since a massive earthquake and tsunami triggered the crisis. "We cannot say that the plant has been sufficiently stabilized. But we are preparing for all kinds of situations and I am convinced that the plant can be stabilized," Kan said, promising a quake relief budget by the end of April.

As Tokyo Electric Power Co tries to regain control of its stricken nuclear plant in the face of mounting public criticism and a huge potential compensation bill, the government was reportedly moving to take control of the utility. Kan said the government had to

"responsibly" support TEPCO as it faced obligations to compensate for the accident. But he said he wanted the firm to continue to "work hard as a private company." The utility may have to deal with compensation claims topping $130 billion, according to one U.S. investment bank.

In the devastated northeast, many Japanese still see only the splintered remains of their homes and lives after a 9.0 magnitude earthquake and tsunami on March 11 that left more than 28,000 people dead or missing and damaged six nuclear reactors. Japan's Nuclear and Industry safety Agency (NISA) says radiation may be continuously flowing out into the sea. Radiation 4,000 times the legal limit has been detected in seawater near the plant as contaminated water used to cool down reactor rods leaks into the ocean, and high levels of radiation outside a 20 km (12 mile) exclusion zone have put pressure on Japan to widen the restricted area. "They are throwing water on what they can't see and hoping that they don't get more radiation out. They are flying blind, partially, at least," said Ed Lyman, senior scientist with the Union of Concerned Scientists, a U.S. nuclear safety watchdog group.

EMERGENCY NUCLEAR WORKERS RECRUITED

Nuclear workers have been offered up to 400,000 yen ($5,000) per day to work in risky high-radiation conditions inside reactors at the Fukushima plant, according to Japanese media. TEPCO says it was considering using "jumpers," or workers who rush into highly radioactive reactors for quick jobs, such as installing water pumps, then "jump" out to avoid prolonged exposure to radiation. The practice was common in the United States in the 1970s and early 80s. (1800, 4/1 SITREP)

Concrete pumps to Fukushima – World Nuclear News
01 April 2011 **http://www.world-nuclear-news.org/RS_Concrete_pumps_to_Fukushima_0104111.html**

Four more concrete pumping trucks are on their way to the Fukushima Daiichi nuclear power plant to help the effort to maintain fuel ponds.

Having overheated and suffered serious drops in water level, the used fuel ponds in the upper parts of damaged units 1, 3 and 4 were refilled by a number of ad-hoc means.

First came ineffective drops by helicopter, next was spraying from fire trucks. The situation was brought closer to control with the arrival of Hyper Rescue and Super Pump Truck from the Tokyo Fire Department, but it was an extra-large concrete pumping machine that has been most effective, particularly at unit 4 where steelwork obstructs spraying from the ground.

The machine already on-site is a Putzmeister 58, named after the length of its boom in metres, supplied to Tepco on the initiative of Hiroshi Suzuki, director of Putzmeister Japan. It is able to pump up to 120 cubic metres of seawater per hour with fairly high

precision thanks to a flexible boom. In earlier phases of the Fukushima accident, the ability to control the pumps remotely was a great help in reducing radiation doses to workers.

The site will soon receive delivery of two 62 metre units that were available from a Putzmeister factory in Germany and as well as two 70 metre units from the USA. The German machines were loaded and sent to Japan yesterday, while Putzmeister warned that arranging landing shipment for the huge Antonov cargo aircraft may take more time in the USA.

Tokyo, April 1 Kyodo, Tokyo Electric warned for not securing enough dosimeters for workers. http://english.kyodonews.jp/news/2011/04/82534.html

The government's nuclear regulatory agency said Friday it had issued another warning to Tokyo Electric Power Co. over the management of workers' radiation exposure at the crippled Fukushima Daiichi nuclear power plant, after it was found that there were not enough dosimeters to cover all of the workers. Some workers were sharing dosimeters while doing the same job because many of the devices were destroyed in the March 11 quake and tsunami.

TEPCO had been able to secure a total of 420 dosimeters by Thursday, sufficient for each of the workers to wear a device when working at the radiation-leaking site. TEPCO officials said the number of dosimeters available had declined from an initial 5,000 to 320 after the tsunami damaged devices. It had been managing the workers' radiation exposure by ordering the leader of each work team to wear a dosimeter, but some workers had expressed concern about the situation.

Regarding the incident on March 24, it was found that a worker who should have been checking on-site radiation levels was absent and three workers had been engaging in work to lay cables without measuring the radiation dose. According to the Nuclear and Industrial Safety Agency, a total of 21 workers have been exposed to radiation exceeding 100 millisieverts so far during the ongoing crisis at the Fukushima Daiichi plant. Workers are usually permitted to be exposed to up to 100 millisieverts in an emergency situation. The limit, however, has been raised to 250 millisieverts specifically for the work at the plant. (0600, 4/1 SITREP)

Tokyo, March 31 Kyodo, 1000 bodies of victims to remain buried due to high radiation levels. http://english.kyodonews.jp/news/2011/03/82200.html

Radiation fears have prevented authorities from collecting as many as 1,000 bodies of victims of the March 11 earthquake and tsunami from within the 20-kilometer-radius evacuation zone around the stricken Fukushima nuclear plant, police sources said Thursday. One of the sources said bodies had been "exposed to high levels of radiation after death." The view was supported by the detection Sunday of elevated levels of radiation on a body found in Okuma, Fukushima Prefecture, about 5 km from the Fukushima Daiichi Nuclear Power Station. The authorities are now considering how to

collect the bodies, given fears that police officers, doctors and bereaved families may be exposed to radiation in retrieving the radiation-exposed bodies or at morgues, according to the sources. Cremation or conventional burial may be difficult as each method may spread the contamination. Decontamination also creates the possibility of further spread. (1800, 3/31 SITREP)

Tokyo, March 31, Kyodo Groundwater at nuclear plant 'highly' radiation-contaminated. http://english.kyodonews.jp/news/2011/04/82390.html
More signs of serious radiation contamination in and near the Fukushima Daiichi nuclear power plant were detected Thursday, with the latest data finding groundwater containing radioactive iodine 10,000 times the legal threshold and the concentration of radioactive iodine-131 in nearby seawater rising to the highest level yet. The contaminated groundwater was found from around the No. 1 reactor's turbine building, although the radiation level of groundwater is usually so low that it cannot be measured.

Japanese authorities were also urged to consider taking action over radioactive contamination outside the 20-kilometer evacuation zone around the plant, as the IAEA said readings from soil samples collected in the village of Iitate, about 40 km from the plant, exceeded its criteria for evacuation. (1800, 3/31 SITREP)

NHK Summary reported by JAIF as of 0800, March 31.

- The presence of water contaminated by high-level radiation at the Number 1 through Number 3 reactors is hampering work to restore the reactors' cooling systems.
- By Thursday morning, TEPCO had emptied a tank for temporary storage of contaminated water from the turbine building of the No. 3 reactor and started a similar operation at the No.1 reactor. Work is continues to remove contaminated water from tunnels just outside the No. 1 reactor building.
- On Thursday, work began to transfer the water from the tunnel to a storage tank to prevent it from flowing out to sea. TEPCO says that by the day's end (March 31 JST), the water level in the tunnel had been lowered by about one meter.
- TEPCO will install monitoring cameras to track water levels in the tunnels.
- On Thursday, unfavorable weather conditions forced TEPCO to postpone a plan to spray a synthetic chemical on the radioactive debris scattered on the grounds of the plant as a result of a series of explosions at the plant in mid-March. TEPCO is hoping that the adhesive chemical will prevent the radioactive dust from being carried away by winds. (1800, 3/31 SITREP)

Tokyo, March 31, Kyodo. **Radioactive substance exceeding limit found in beef in Fukushima Pref.** http://english.kyodonews.jp/news/2011/04/82389.html

The health ministry said Thursday that beef in Fukushima Prefecture, where the crippled nuclear power plant is located, contained a radioactive material exceeding the legal limit, making it the first such detection in beef. The Ministry of Health, Labor and Welfare said 510 becquerels of radioactive cesium was detected in beef from Tenei, Fukushima Prefecture, above the 500-becquerel legal limit set under the food sanitation law. But an official for the Nuclear and Industrial Safety Agency said in Fukushima early Friday that

it will conduct a fresh examination on beef, citing a significant gap in radiation levels between the sample taken in Tenei and other meat samples. Tenei is located nearly 70 kilometers away from the Fukushima Daiichi nuclear power plant (1800, 3/31 SITREP)

CONTACT INFORMATION:
Nuclear Incident Team in the Emergency Operations Center

(b)(6)

Office of the Deputy Secretary 202-586-5500

Watch Schedule April 1-2:

John Gerrard Rich Reister	1600-2000/1 April
Alex Sunshine Craig Welling	0400-0800/2 April
Tom Robinson Tim Beville	1600-2000/2 April

Japan Earthquake Response
April 1, 2011 // 1800 EDT

AR/4

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)

Current Status

- **No major changes in radiation levels at the Fukushima Daiichi Nuclear Power Plant**
- **Additional power plant status in accompanying text SITREP**
  - Unit 1: Reactor water level stable, core damage est. 70%. Freshwater injection continues. Electrical power line connected. Pumping freshwater into reactor vessel slowed due to limited capacity to handle discharge. Pumping freswater in spent fuel pool.
  - Unit 2: Reactor water level stable, core damage est. 33%. Spent fuel pool has been filled however fresh water injection has been suspended. TEPCO reports having switched over to a temporary electrical pump to inject fresh water into Unit 2, in place of the fire pump that had previously been used.
  - Unit 3: Freshwater injection continues; trucks pumping water into spent fuel pools. Reactor water level 1.9 m (A) 2.3 m (B) below the top of the fuel rods.
  - Unit 4: Spraying continues periodically for the spent fuel pool. Power restored. Trucks pumping water into spent fuel pool. Synthetic resin sprayed near reactor to fix contamination.
- TEPCO continues to address issues with water in the trenches outside the turbine buildings of Units 1, 2 and 3
  - TEPCO constructing a water treatment facility to reduce activity in water discharged to the sea.
  - The Nuclear Safety Commission of Japan suggests that higher activity in the water discovered in the Unit 2 turbine building is supposed to be caused by water, which has been in contact with molten fuel rods for a time and directly released into the turbine building via some, as yet unidentified, path
- Voluntary evacuation zone extended to 30km from Fukushima Daiichi.

DOE/NNSA 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 Monitoring 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 (40)

Yokota AB

(1) SEO
(1) SEO Staff
(24) CMRT
(9) AMS

US Embassy Tokyo

(3) DART LNO
(1) Nuclear Energy Representative

USPACOM HQ

(1) LNO

Upcoming personnel changes:

5 personnel scheduled to deploy to Japan April 1, 2011

3 personnel scheduled to deploy to Japan April 2, 2011

Mission Summary

Type	Last 12 Hours	Total
AMS Flight Hours	0	179
Field Measurements	8,931	60,807
Air Samples	120 paper filters 120 charcoal filters	120 paper filters 120 charcoal filters
Soil Samples	1	1

Field measurements are a combination of DOE, DoD, and GOJ data including automated downloads from several remotely monitored stations. Figures accurate as of 0400 EDT 1 APR 11.

Significant Events: Past 24 Hrs.

International Engagement:

- Met with MEXT to discuss:
  - Joint monitoring and sampling priorities
  - Sharing data
  - Technical cooperation
- Major General Bonsho visit to DOE team at Yokota cancelled
- Coordinated with MHLW on drinking water screening
- GOJ ministries requested support for sample analysis of food, soil, and water. Support will require sensitive detectors (High Purity Germanium), support equipment, and training.
- Received request from the Japanese Government to assist in plume/dose reconstruction of impacted population

Nuclear Incident Team:

- Provided ground monitoring and aerial measuring data spreadsheets to CDC, FDA, HHS, USDA, EPA, NRC, DHS, NR, and WH
- Coordinated 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
  - Continued monitoring activities at the US Embassy Japan
    - AMS UH-1: Flew the southern half of Tohoku Expressway south of Kortyama to the hills north of Kurolso to complete planned mission from 3/30.
    - AMS HH-60: Flew the southern half Tohoku Expressway north of Kortyama to the north side of Fukushima to complete planned mission from 3/30.
    - AMS C-12: Flew the metro area of north Tokyo across the valley flying east to west at the request of GOJ.
    - One ground team drove out to the east side of Tokyo Bay to Choshi, drive up the coast to the Tokai NPP then return. Teams conducted beta/gamma surveys, in-situ gamma spec and low-volume air sample for particulate/iodine.
    - One ground team traveled to Yokuska to collect the air sample.
  - Triage analysis of Air filters for US Embassy and Harris Towers complete
- Medical Consult
  - Responded to RFI on bioassay for U.S. workers deployed to Japan

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

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)

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.

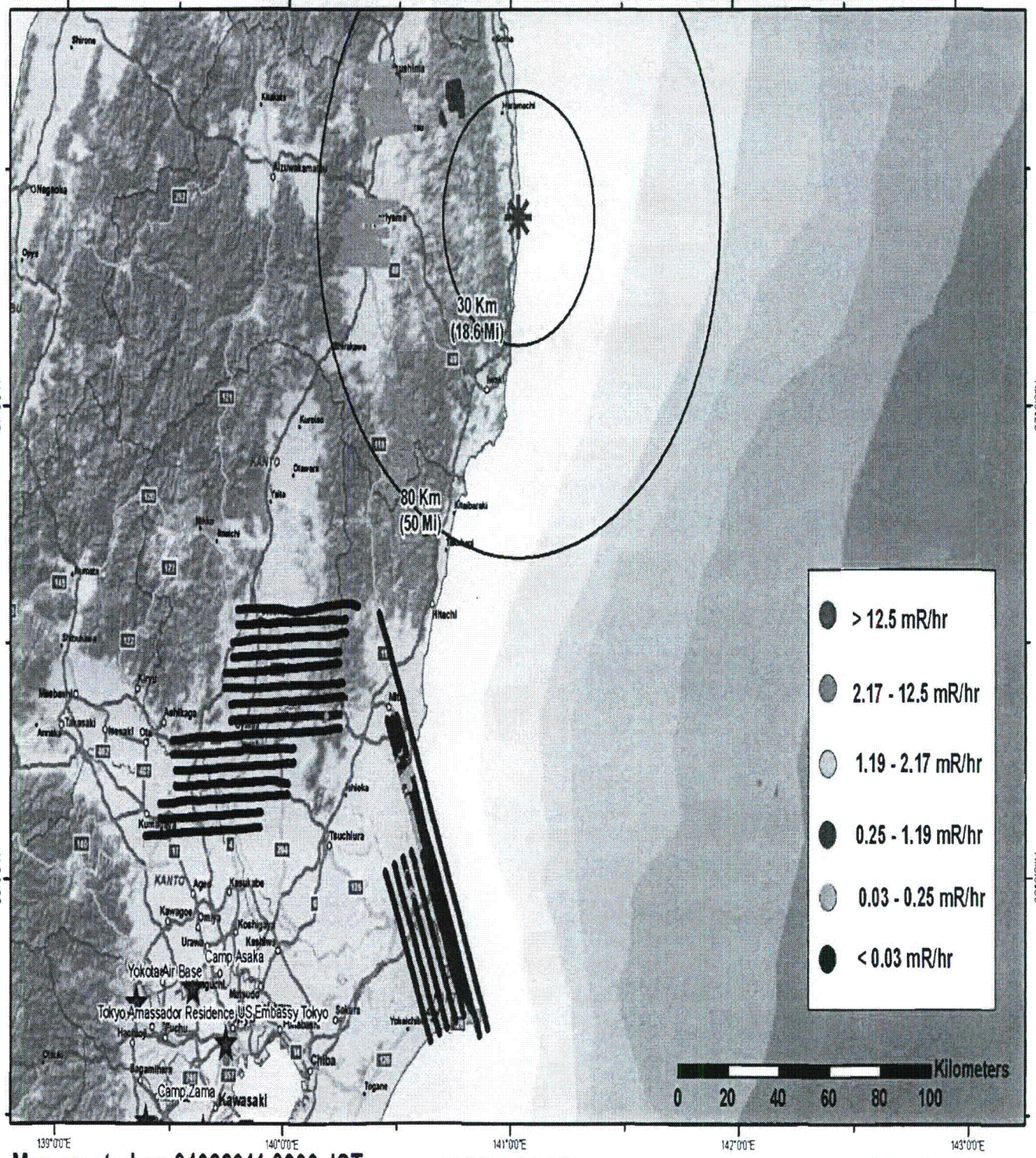
The measured external dose rates in these areas are not high enough to warrant evacuation or relocation of the population, however, lower levels of radioactive contamination in agricultural products provide more of a risk because the radioactive material can be ingested into the body. Agricultural monitoring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

Aerial Monitoring Results
Combined Flights (April 01, 2011)

FUKUSHIMA DAIICHI
JAPAN

National Nuclear Security Administration



Map created on 04022011 0330 JST

Name: NIT C-12 Combined Flight Results 01Apr2011

~~UNCLASSIFIED~~

Nuclear Incident Team DOE NIT

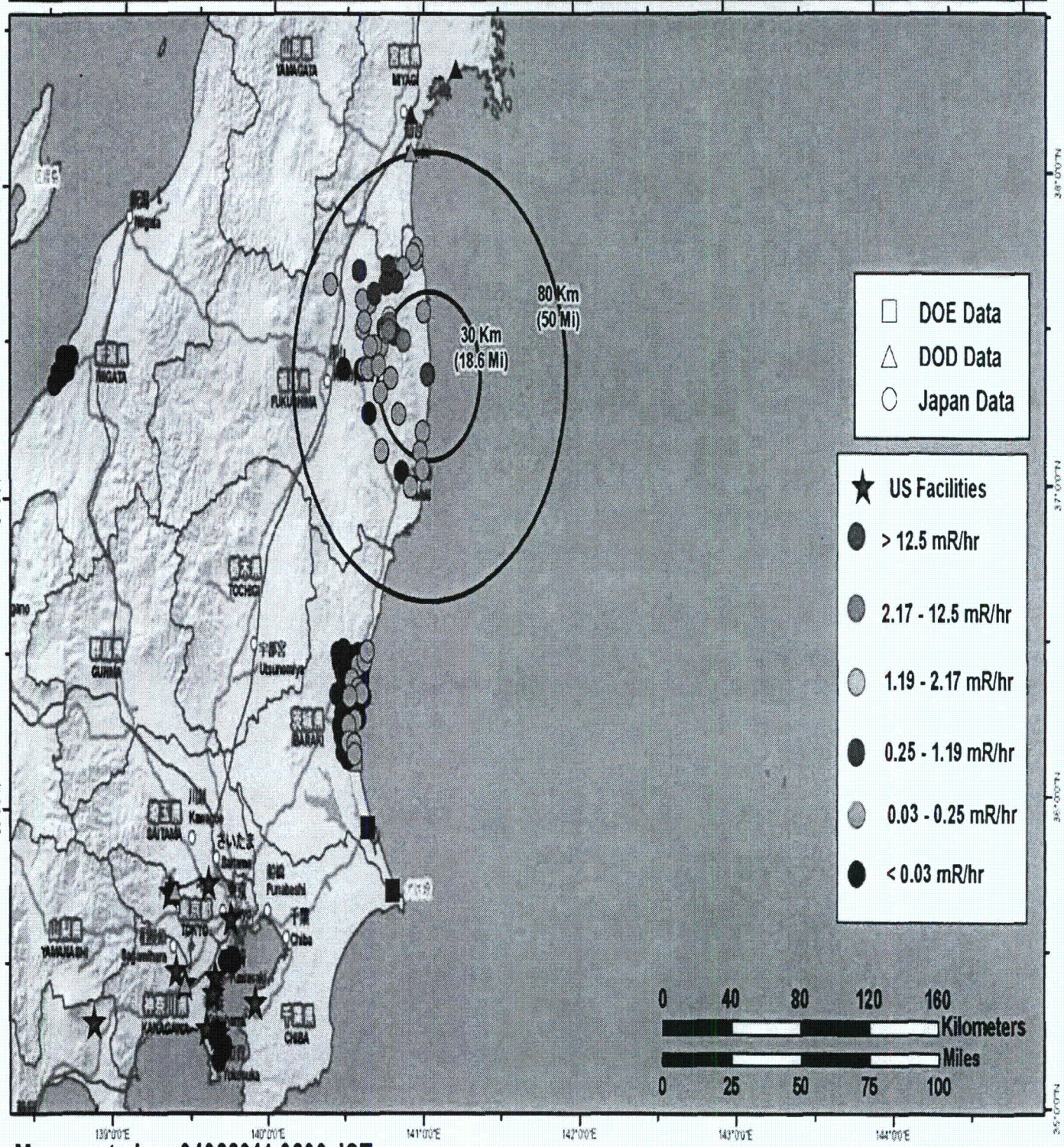
Contact (b)(6)

Field Monitoring Results

April 1 01:00 to April 2 01:00 JST

FUKUSHIMA DAIICHI
JAPAN

National Nuclear Security Administration



Map created on 04022011 0200 JST

Name: NIT 24hrsMonitoringResults 01Apr2011 0100

~~UNCLASSIFIED~~

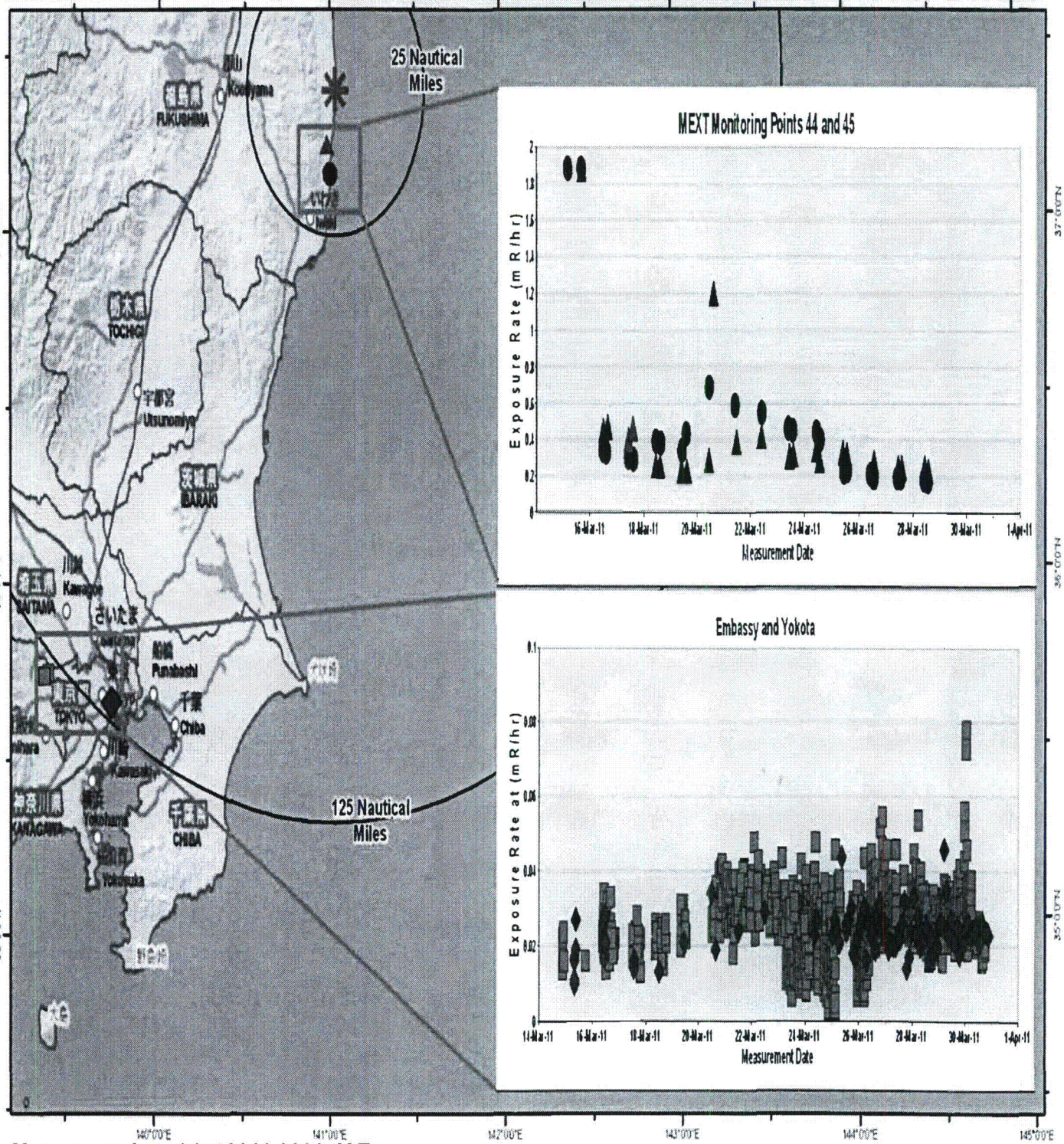
Nuclear Incident Team DOE NIT

Contact (b)(6)

Exposure Trend Plot
Extending South to Yokota AB

FUKUSHIMA DAIICHI
JAPAN

National Nuclear Security Administration



Map created on 04012011 0200 JST

Name: CMHT MonTrend 31Mar2011 South

~~UNCLASSIFIED~~

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

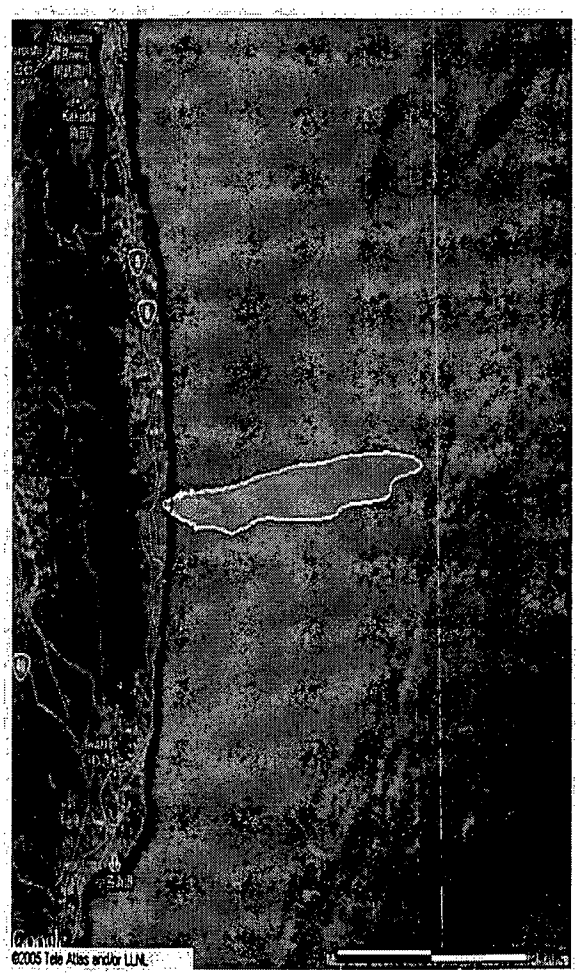
Aerial and Ground Monitoring Data Assessment

Assessment:

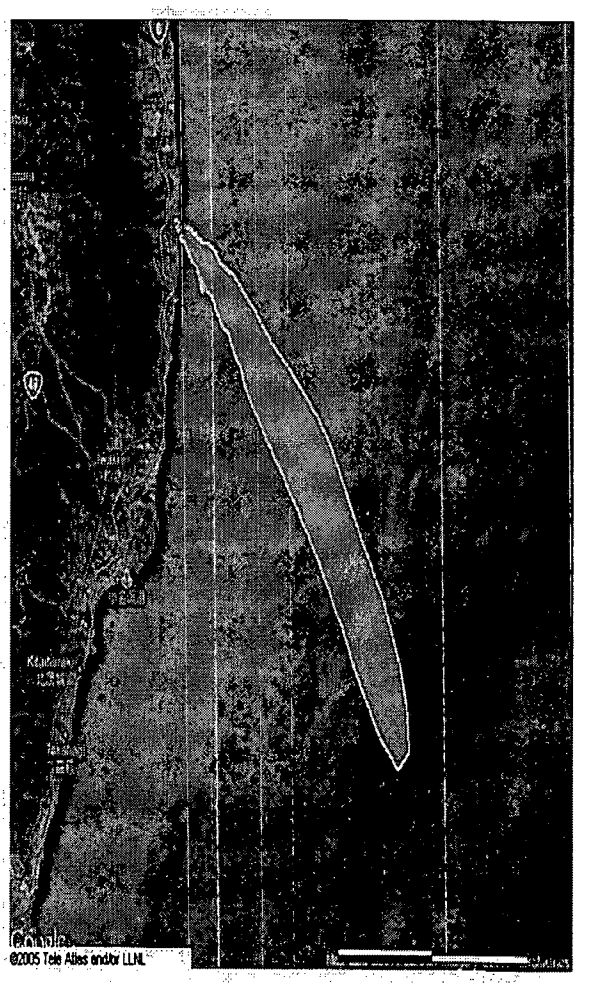
- An assessment of measurements gathered through 01 April continue to show:
  - Radiation levels consistently below actionable levels for evacuation or relocation outside of 25 miles.
  - Radiological material has not deposited in significant quantities in the areas measured since 19 March

Forecasted Weather
April 1 to April 2

04/02/2011 08:00:00 JST



04/03/2011 08:00:00 JST



Planned Operations: Next 24 Hrs

- Aerial Monitoring
  - 3 flights in areas to be determined
- Ground Monitoring
  - TBD
  - When approved: Coordinate with AFRAT to insert 8 DOE "Infield" radiation search systems for use as Distance Early Warning line.
- Continue joint Monitoring and Assessment planning with DoD (US AFRAT).

DEPARTMENT OF ENERGY SITUATION REPORT
Earthquake & Tsunami in Japan
3 April 2011
18:00 (EDT) UPDATE

POWER PLANT UPDATE AND OTHER NUCLEAR ISSUES

Summary of information received as of 18:00 (EDT) 3 April from the Kyodo News. (NOTE: JST = EDT + 13 hours; EDT = GMT/UTC – 4 hours). A 20 cm crack was discovered on the concrete lateral of the pit (pit connected to the No. 2 reactor building). An initial attempt to block the leak was unsuccessful; therefore, a second attempt to block the leakage with a polymeric material as well as additional concrete was attempted on Sunday April 3, beginning at 13:40 JST. NISA has reported the absorbent did not reach the intended pipe and that so far there has been no decline in the amount of contaminated water leaking into the ocean. Engineers are now trying to mix the absorbent with water, and NISA will continue monitoring the situation until Monday to see if the technique yields positive results. (1800, 4/3 SITREP)

IAEA and TEPCO both report that in 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. (1800, 4/3 SITREP)

The water has been filling up the basement of the No. 2 building and a tunnel-like underground trench connected to it. Kyodo news reported that per NISA spokesman, TEPCO has confirmed that pits from the plant's other reactors do not have similar cracks. Workers have also been checking the condition of the embankment at the plant on the coast to find out other possible routes for radiation leakage into the sea. TEPCO has revealed that radioactive iodine-131 more than 10,000 times the legal concentration was detected in the water found in the pit. TEPCO reports that work began at 13:55 PM JST on April 3 to drain water from the underground floor of the turbine buildings, transferring the water to a suppression pool water surge-tank in Unit 1. (1800, 4/3 SITREP)

Per the JAIF, TEPCO is obtaining a "massive, hollow floating platform" from Shizuoka City and will use it to store contaminated water from the Fukushima site. The float can store up to 18,000 tons of water. Meanwhile TEPCO and the Japanese government are working to identify safe methods for transporting and storing contaminated water. (18:00, 4/2 SITREP)

Per IAEA, transfer of fresh water from the US Navy barge to the 'filtered water tank' near reactor No.1 started on April 1 at 15:38, and was suspended on April 1 around 17:00 due to a connection failure. JAIF reported on Sunday April 3 that a second US Navy barge carrying about 1,300 tons of fresh water arrived at the site on Saturday April 2. (1800, 4/3 SITREP)

AR/5

Note: With the 18:00 March 31 SITREP we started labeling each entry 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. (06:00, 4/2 SITREP)

Updates on Reactor Vessel Integrity:

No updates since 0600 4/1 SITREP. Per JAIF as of 0300 EDT April 1, it is presumed that radioactive material inside the reactor vessels may have leaked outside Units 1, 2 and 3. NISA announced that the reactor pressure vessel of Units 2 and 3 may have lost air tightness judging from the low pressure inside the pressure vessel. NISA reports that it is unlikely that these are cracks or holes in the reactor pressure vessels. (0600, 4/1 SITREP)

Updates on Cooling Efforts and Cooling Water Management:

Kyodo News reports Tepco plans to construct a large floating platform, a so-called "megafloat," to store the tainted water from the reactor. World Nuclear News reports that TEPCO plans to construct a 6000 tonne water tank as well as a 4000 tonne pond. These will work in conjunction with a 20 tonne per hour treatment facility to handle water from drainage canals around all six reactors at the plant. The tank and pond should be complete around the middle of this month, with the treatment facility following about two weeks later. The set-up should let the company mitigate the discharges to sea by safely storing and sampling the water and only discharging it after treatment. Kydo News reports that the amount of water detected in the plant has reached around 13,000 tons. (0600, 4/2 SITREP)

Near the No.4 reactor, 400 liters of a synthetic resin solution were sprayed in an experiment intended to solidify contaminated dust and prevent radioactive materials from getting airborne. Plant operator Tokyo Electric Power Company is due to test the solution for about 2 weeks to see if it works. (1800, 4/1 SITREP)

Updates on Electrical Power Restoration Efforts:

No updates since 0600 March 29 SITREP. Power distribution panels (Power Centre) in Units 2 and 4 connected to the off-site electrical supply; lighting in units 1, 2, 3, and 4 control rooms restored; some instrumentation recovered for units 1, 2 and 4 with individual components are still being checked prior to being energized. (0600, 4/2 SITREP)

Updates on Injuries and Exposure of Daiichi Workers:

From 3 April Kyodo news, TEPCO said that two workers in their 20s who have been missing were found dead in the basement of a reactor turbine building last Wednesday, March 30. They died of bleeding from multiple injuries resulting from the tsunami. This

is the first time that TEPCO workers have been confirmed to have died at the plant. (0600, 4/3 SITREP)

TEPCO reports that at 11:35 JST April 1st, a TEPCO worker fell into the sea while stepping onto a ship from the pier during the hose laying work of the barge. He was immediately rescued. While no injury or contamination was confirmed, a full-body analysis will be performed to determine contamination (0600, 4/2SITREP)

Radiation Detection Updates:

NHK reports on Sunday April 3 that radiation levels on the ground in many areas near the Fukushima Daiichi nuclear plant are gradually decreasing. Chief 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)

Kyodo News reports that the Ministry of Health, Labor and Welfare said Sunday April 3 that it has detected radioactive substances higher than the legal limits in mushrooms sampled Friday in Iwaki, Fukushima Prefecture, where the crippled Fukushima Daiichi nuclear power plant is located. The Ministry said it found the mushrooms to contain 3,100 becquerels of radioactive iodine and 890 becquerels of radioactive cesium against the limits of 2,000 becquerels and 500 becquerels. (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)

Per NRC update 0430 EDT, 3 April, 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. IAEA confirms a no-fly zone out to 30 km around the Fukushima Daiichi plant. (0600, 4/3 SITREP)

Per a TEPCO press release, on April 2 at around 09;30 Japan time (JST), TEPCO employees detected water containing radiation dose over 1,000 mSv/h in a concrete pit where supply cables are stored near the intake channel of the Unit 2 reactor.

Per JAIF as of 1800 JST on April 3, Radiation levels were 0.83mSv/h at the south side of the office building, 127μSv/h (slight decrease from April 2 JAIF report) at the Main gate, 59μSv/h at the West gate. (0600, 4/3 SITREP).

It was also discovered on April 2 that there is highly radioactive (more than 1000mSv/hr) water in the concrete structure housing electrical cable and this water is leaking into the sea (see detail in General item) (18:00, 4/2 SITREP)

JAIF reported as of 0800, March 31 that radioactive material in milk and agricultural products from Fukushima and neighboring prefectures. GOJ issued orders to limit shipment and intake for some products. Radioactive iodine exceeding the provisional legal limit was detected from tap water sampled in some prefectures from March 21 to 27. (0600, 4/1 SITREP)

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

Recent events of past 24 hours:

Per NRC update 0430 EDT, 3 April, current meteorological data (at 0200 EDT, 4/3) indicate that the winds are from the NW and are predicted to shift from the SE for a few hours late in the evening, then from the NW through the morning of 4/4. (0600, 4/3 SITREP)

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. (1800, 4/3 SITREP)

Field Monitoring and Assessment

- Continued monitoring activities at the US Embassy Japan (1800, 4/3 SITREP)
  - AMS UH-1 and HH-60: Flew over US Military installations in and around the Tokyo area to provide information for USFJ to issue protective action guidance for dependents.
  - AMS C-12: Flew in the valley from the south near Shirasaka to the mountains on the west side, north to Shiroi, and east to the ocean.
  - 2 ground teams conducted surveys of military installations in the Tokyo area in support of the aerial mapping
  - 1 ground team took ground measurements on Yokota AB

Medical Consult

- Nothing substantial to report (1800, 4/3 SITREP)

Planned operations over the next 24 hours:

- Aerial Monitoring (1800, 4/3 SITREP)
  - AMS UH-1: Planned re-flights along the eastern flanks of the mountains on the west side of the Tohoku Expressway valley north of Kortyama to the north side of Fukushima

- AMS UH-1 (second aircraft available after 1100): UH-1, a second aircraft will be available after 1100, it will survey the coast south of Mito at 500ft with 1000 ft line spacings
- AMS HH-60: Unavailable due to
- AMS C-12: Continue to fly in the valley from the south near Shirasaka to the mountains on the west side, north to Shiroi east to the ocean.

- Ground Monitoring (1800, 4/3 SITREP)
  - Complete beta/gamma exposure rate surveys. Radio nuclide evaluations are to include in-situ measurement assessment of gamma isotopes.
- Continue joint Monitoring and Assessment planning with DoD (US AFRAT)
- Meeting (4 April) with MEXT on technical cooperation for monitoring and sampling.

Updates by Reactor Unit (Updated each SITREP)

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 8 m3/h using a pump powered with offsite electric power. (1800, 4/3 SITREP)
Per JAIF at 0900 JST 3 April, reactor parameters are: RPV pressure (A) 0.293 MPa Gauge (G), (B) 0.547 MPa G; water level 1.65/1.65 meters below the top of the fuel rods; containment vessel pressure 0.155 MPa absolute (abs); RPV feedwater nozzle 252.8 °C. (1800, 4/3 SITREP)

As of April 1, 1100 JST water level in trench is 1.14m below floor level. (1800, 4/3 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. Intermittent steam-like substance emitting from SFP 1, 2, 3, 4 from injection/spray. (Source: JAIF) (0600, 4/3 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 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 9 m3/h using a pump powered with offsite electric power. (1800, 4/3 SITREP)

Per JAIF 0900 JST 3 April, RPV pressure (A) -0.016 MPa G, (B) -0.018 MPa G; water level 1.60 meters below the top of the fuel rods; containment vessel pressure 0.105 MPa abs. Per IAEA as of 1715 UTC April 3, the indicated temperature at the feed water

nozzle of the RPV has decreased from 161 °C to 153 °C and bottom head is not reported. Per JAIF at 0900 JST 3 April SFP temperature is 61°C, a decrease of about 11°C from the previous measurement on April 2. (1800, 4/3 SITREP)

Per NRC update 0430 EDT, 3 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 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 7 m3/h using a pump powered with offsite electric power. (1800, 4/3 SITREP)
Per JAIF at 1030 JST April 3, RPV pressure is (A) 0.011 MPa G (B) -0.083 MPa G; reactor water level is (A) 1.85 m (B) 2.25m below the top of the fuel rods; containment vessel pressure 0.1062 MPa abs. Per IAEA at 1715 UTC on April 3, the indicated temperature at the feed water nozzle of the RPV is about 118 °C and at the bottom of RPV is about 92 °C. (1800, 4/3 SITREP)

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

No data is available for SFP pool water temperature as of this report.
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):

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.
Per NISA, freshwater spray to the Spent Fuel Pool using Concrete Pump Truck(50t/h) took place at 0825 UTC on April 1.

Fukushima Dai-ichi Unit 5 reactor (NRC priority 5):
Unit 5 was in a refueling outage at the time of the earthquake.
Unit #5 SFP contains 946 elements.
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 1100 JST 3 April, the SFP water temp was 29.1°C. (1800, 4/3 SITREP)
Power was switched to off-site power on March 21.

Fukushima Dai-ichi Unit 6 reactor (NRC priority 6):
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.
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.
Per JAIF, as of 1100 JST 3 April, SFP water temp was 29.0°C. (1800, 4/3 SITREP)
Power supply to Unit 6 was switched from to temporary power to permanent supply on March 25.

Fukushima Daiichi Common Spent Fuel Pool

At 100 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, and the temperature was 39 °C as of 0800 JST 27 March.
The IAEA also reported on March 30th, 2011 that the Common Spent Fuel Pool temperature remains stable.

Other Information

The IAEA has announced that it will hold a high-level conference on preliminary lessons learned from Fukushima on June 20-24, 2011. Information is available at www.iaea.org.

REQUESTS FOR US ASSISTANCE

TEPCO-NISA has requested six storage tanks and a trailer from DOE, and additional information about the transportation and usage at the Fukushima site. TEPCO-NISA also inquired as to whether DOE would be willing to send any more storage tanks (0600, 4/2 SITREP).

GOJ Prime Minister's Office requested the Early Warning Line proposal come from a civilian ministry--not the MOD. DOE will try to coordinate with MEXT on this issue. (0600, 4/2 SITREP)

GOJ Ministries have requested support for analysis of food, soil, and water samples. GOJ has requested additional HpGe detectors from DOE. (0600, 4/2 SITREP)

The GOJ has requested assistance from DOE in the handling and storage of contaminated water from at the Fukushima reactors. Secretary Chu has offered to provide equipment and capabilities at DOE sites to support the Fukushima water clean-up effort. TEPCO said they hope they can receive the six stainless steel horizontal storage tanks (16,000 gallons each) and high activity trailer (1000 gallon capacity) as soon as possible. Capabilities include existing pumps and storage tanks that can be deployed quickly, as well as resources that can be utilized to design and acquire systems for the safe handling and storage of contaminated water. (1800, 4/1 SITREP)

ENERGY INFRASTRUCTURE:

No further updates. (1800, April1 SITREP)

On 30 March, NISA issued a press release instructing nuclear plant operating companies to review safety plans and systems to ensure core and spent fuel cooling capability in case of tsunamis and/or station blackout conditions. Operating companies were requested to report on the status of their actions. Per this press release, NISA will verify these plans within one month.

CONTACTS WITH GOJ OFFICIALS:

An interagency group will be meeting on Monday, April 4 at 1900 JST with U.S. Embassy officials, DOE and NRC. Participants will include 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 include representatives from TEPCO, NISA, METI, MEXT, JSDF and the Nuclear Safety Commission. (1800, 4/1 SITREP)

Media Reports

"Radioactive Water Continues to Leak" (NHK, 16:21 UTC, April 3, 2011)

Japan's Nuclear and Industrial Safety Agency says there has been no change in the amount of radioactive water seeping from the Fukushima, despite efforts to inject a polymer into a cracked pit.
http://www3.nhk.or.jp/daily/english/03_22.html

"Several months needed to stop radiation from Fukushima plant: Gov't" (Kyodo, April 3, 2011)

The government expects that several months may be required before radioactive particles stop being released from the Fukushima Daiichi nuclear plant, Chief Cabinet Secretary Yukio Edano said Sunday.
http://english.kyodonews.jp/news/2011/04/82864.html

CONTACT INFORMATION:
Nuclear Incident Team in the Emergency Operations Center

(b)(6)

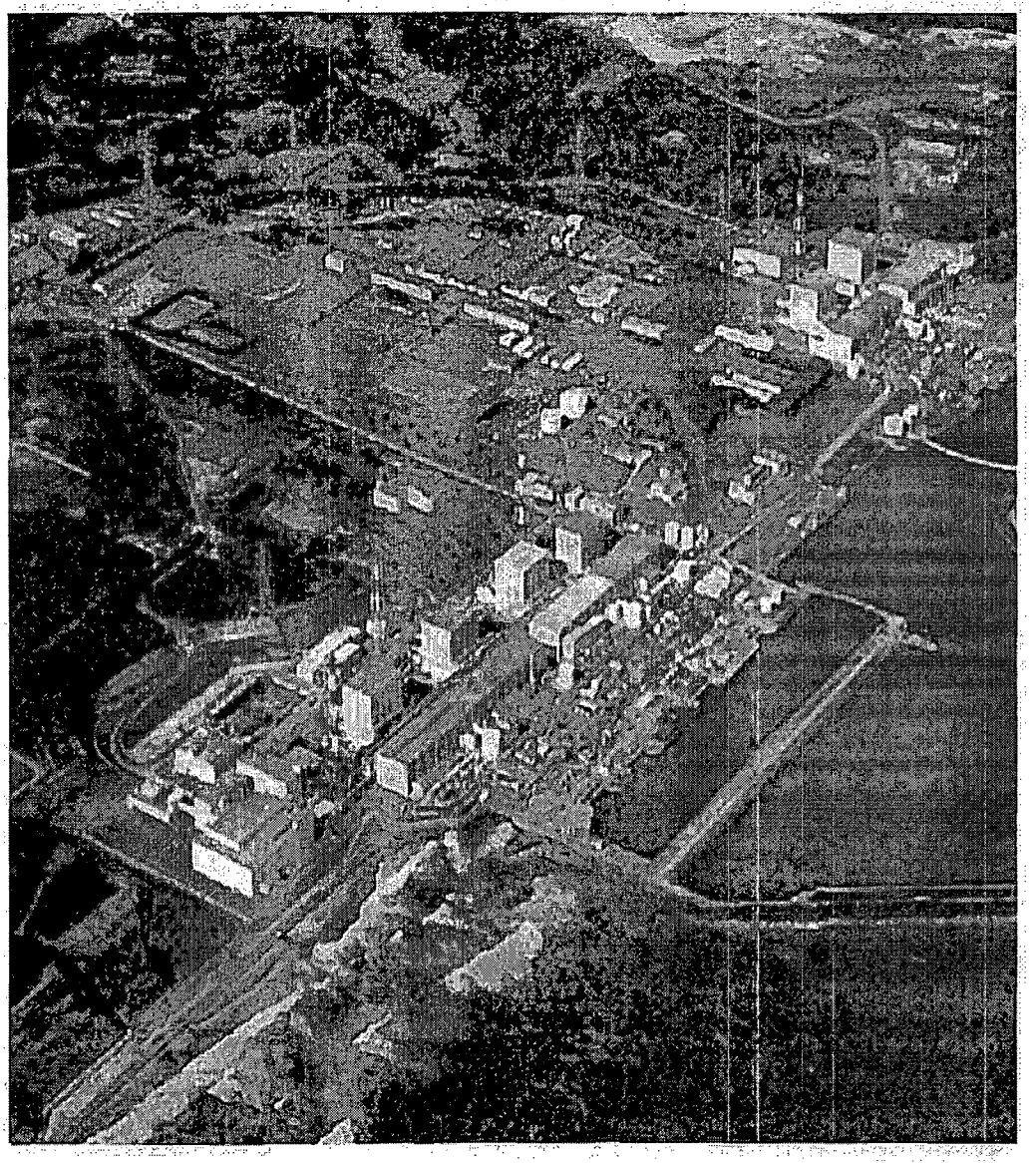
Office of the Deputy Secretary 202-586-5500

Watch Schedule April 3-4:

Ted Wyka 0400-0800/3 April
Matt Nutmaker

James Conner Tim Beville	1600-2000/3 April
Mark Whitney	0400-0800/4 April
Karyn Durbin Michael Worley	1600-2000/4 April

Japan Earthquake Response
April 3, 2011 // 1800 EDT



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Contact: DOE/NNSA Nuclear Incident Team:

(b)(6)

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 trail 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 has been found in a pit connected to the Unit 2 turbine building and is leaking radioactive water into the ocean. Rad levels in the pit exceed 1000 msV/hr. TEPCO attempted to use polymeric and other materials on April 3 to seal the leak, but was unsuccessful.
  - 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.
- 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.

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* (43)

Yokota AB

(2) SEO
(1) SEO Staff
(25) CMRT
(9) AMS

US Embassy Tokyo

(5) 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.*

Mission Summary

Type	Last 24 Hours	Total
AMS Flight Hours	14.6	206
Field Measurements	10,856	96,553*
Air Samples	13	133
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 1730 EDT 3 APR 11.

Significant Events: Past 24 Hrs.

International Engagement:

- GOJ Prime Minister's Office requested the Early Warning Line proposal come from a civilian ministry, vice MOD; DOE will try to coordinate with MEXT
- General Oriki visit to USFJ
- Coordinated further on GOJ ministries' requested support for sample analysis of food, soil, and water. Support will require sensitive detectors (High Purity Germanium), support equipment, and training

Nuclear Incident Team:

- Provided ground monitoring and aerial measuring data spreadsheets to CDC, FDA, HHS, USDA, EPA, NRC, DHS, NR, and WH
- Coordinated 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 and HH-60: Flew over US Military installations in and around the Tokyo area to provide information for USFJ to issue protective action guidance
  - AMS C-12: Flew in the valley from the south near Shirasaka to the mountains on the west side, north to Shiroi, and east to the ocean
  - 2 ground teams conducted surveys of military installations in the Tokyo area in support of the aerial mapping
  - 1 ground team took ground measurements on Yokota AB
- Medical Consult
  - Nothing substantial to report

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

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).

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.

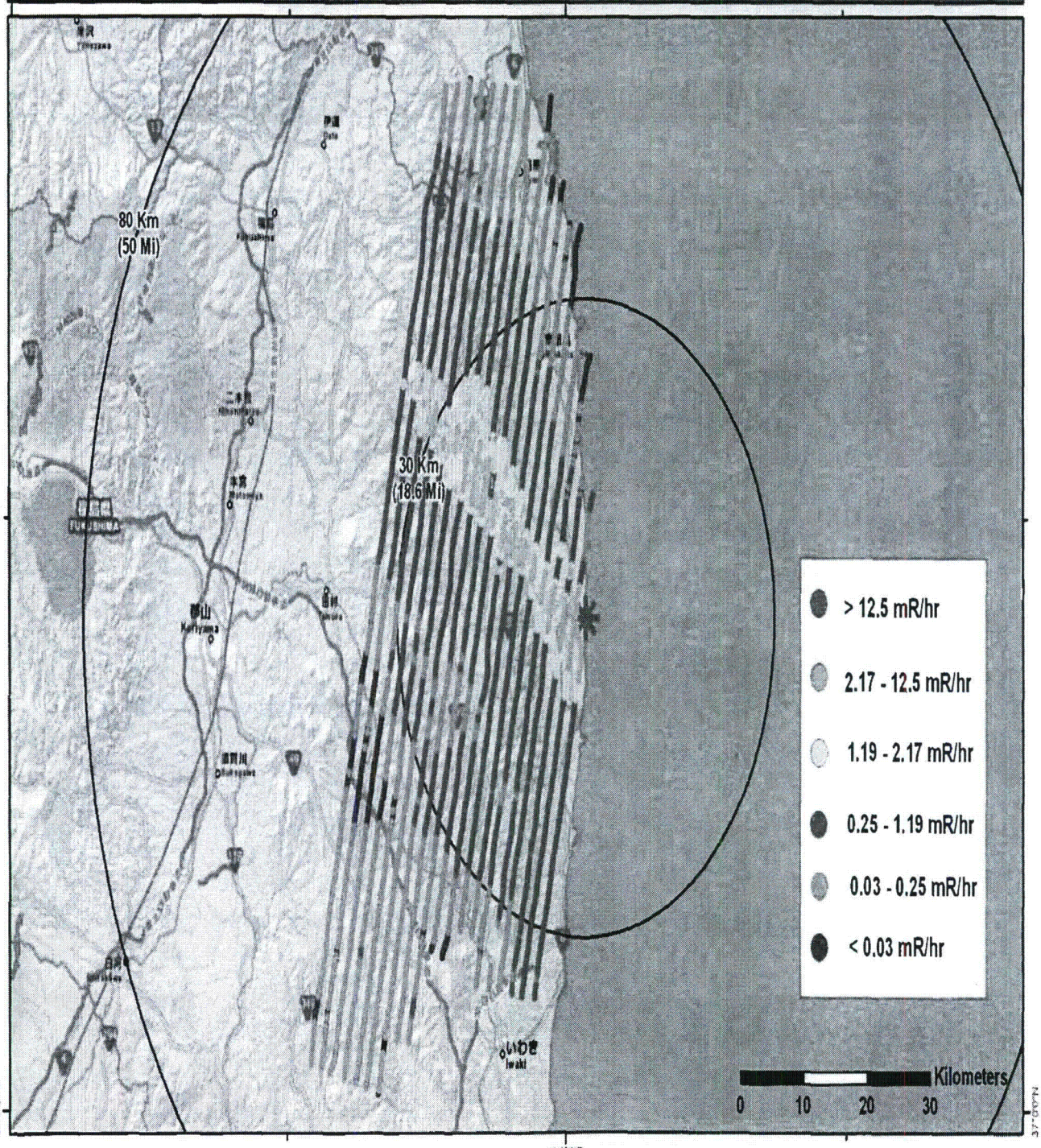
- Areas 10 to 100 times historical background are indicated by green.
- Areas 2 to 10 times historical background are indicated by light blue.
- Areas at or near historical background are indicated by dark blue.

National Nuclear Security Administration

Aerial Monitoring Results

C-12 Flight (April 03, 2011)

FUKUSHIMA DAIICHI
JAPAN



Map created on 04032011 2300 JST

Name: NIT C-12 Results 03Apr2011

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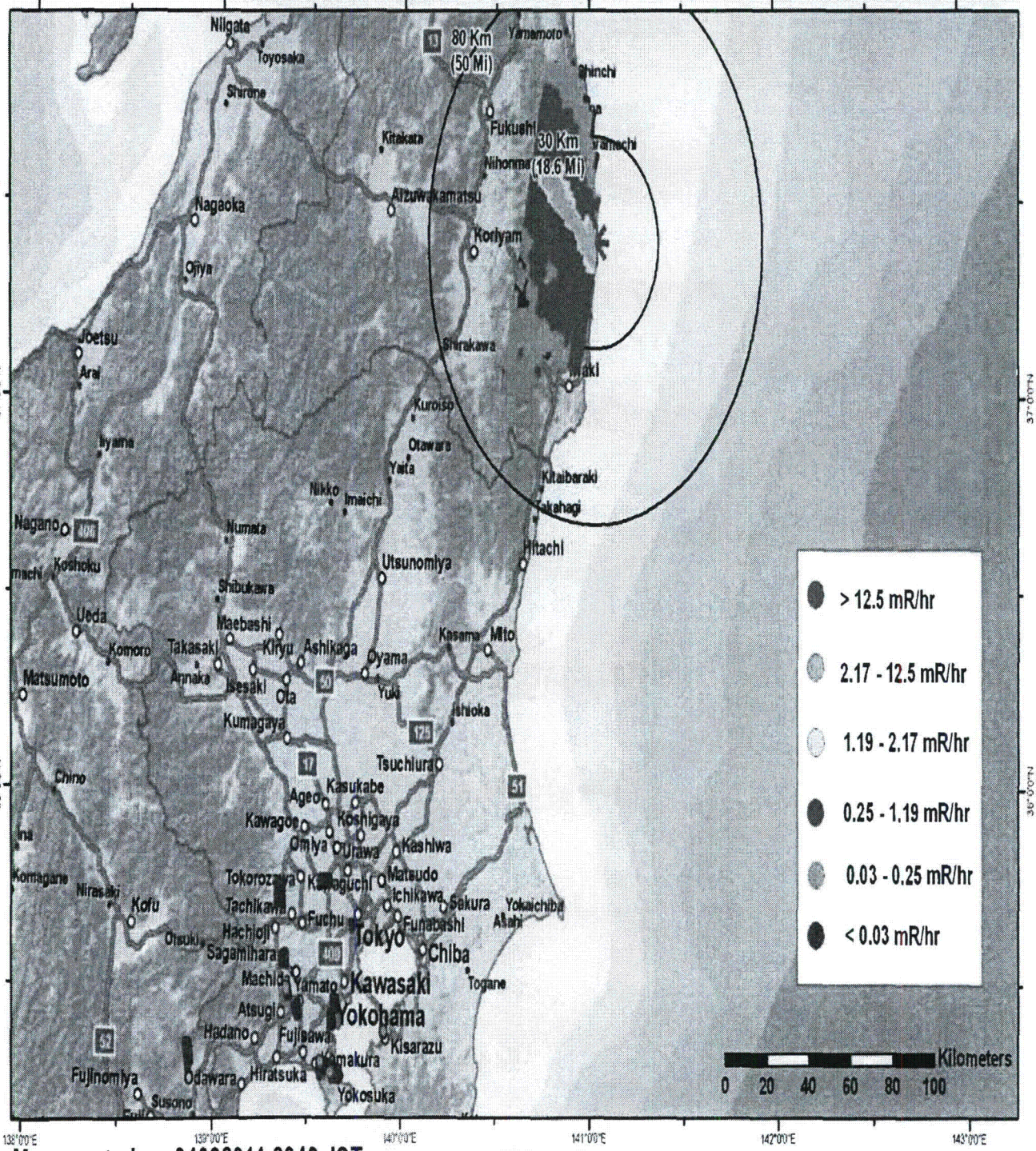
Nuclear Incident Team DOE NIT

Contact (b)(6)

Aerial Monitoring Results
Combined Flights (April 03, 2011)

FUKUSHIMA DAIICHI
JAPAN

National Nuclear Security Administration



Map created on 04032011 2340 JST

Name: NIT Combined Flight Results 03Apr2011

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Nuclear Incident Team DOE NIT

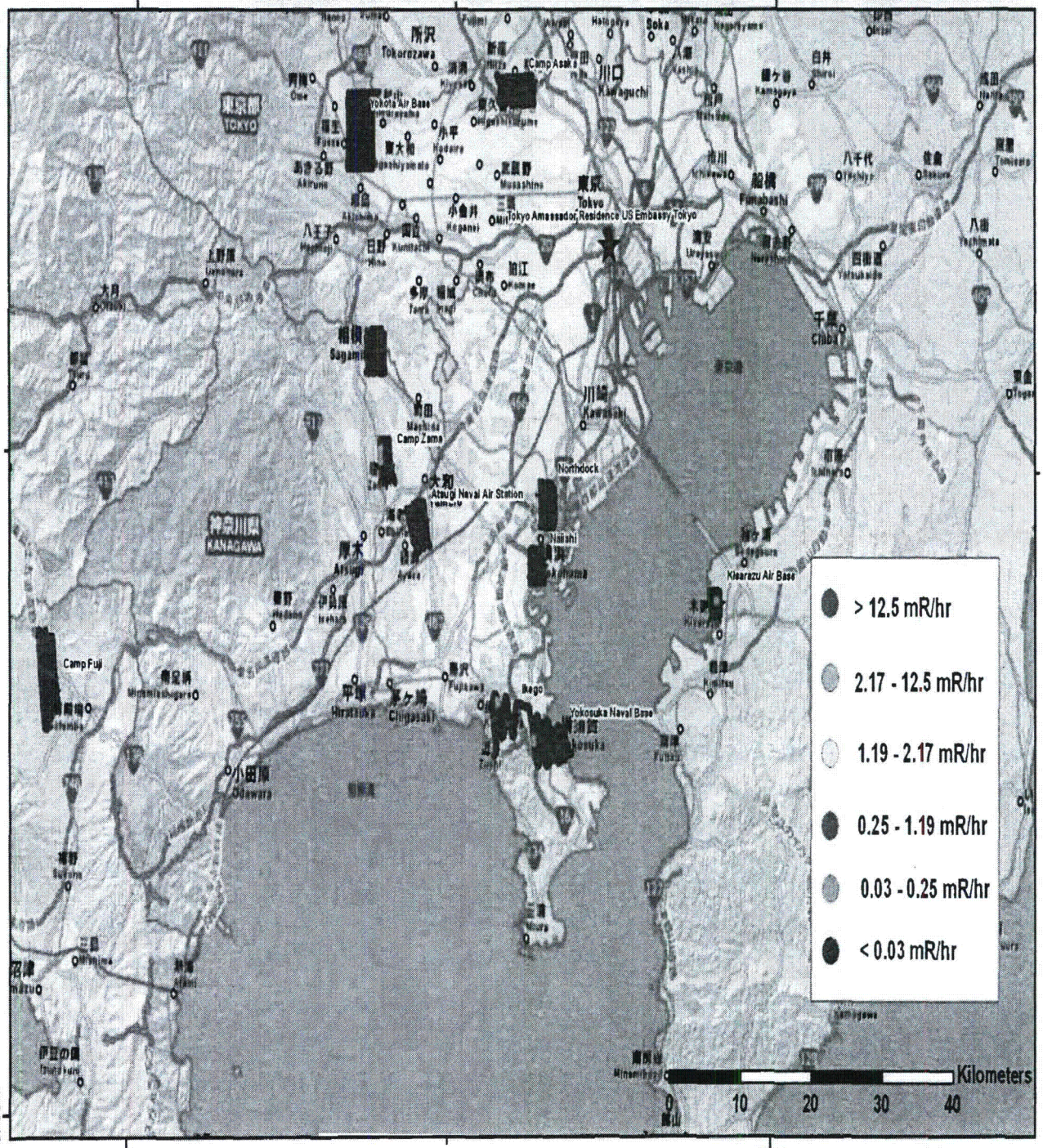
Contact (b)(6)

Aerial Monitoring Results

Combined Flights (April 03, 2011)

FUKUSHIMA DAIICHI
JAPAN

National Nuclear Security Administration



Map created on 04032011 2355 JST

Name: NIT Combined Flight Results 03Apr2011 v2

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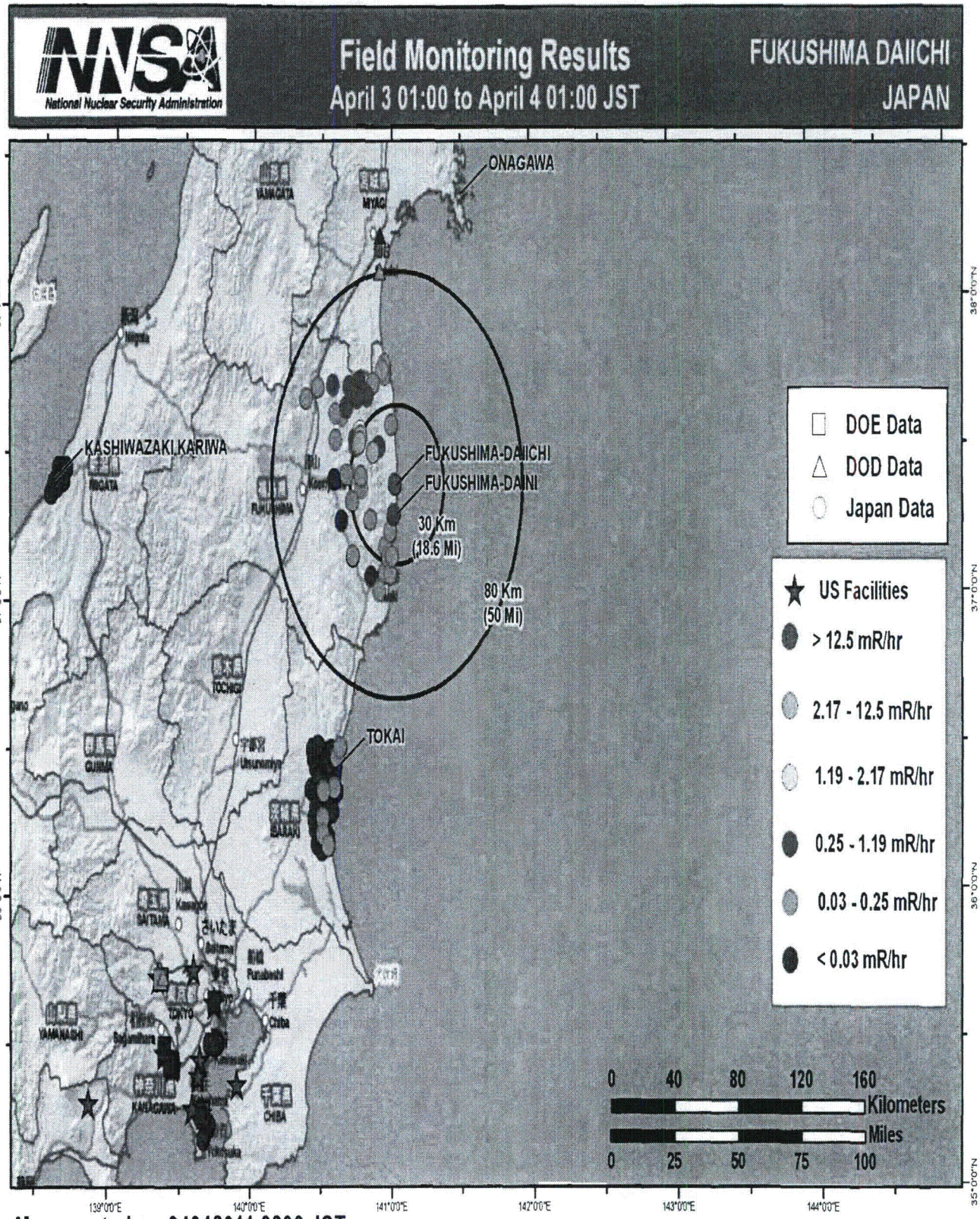
Nuclear Incident Team DOE NIT

Contact (b)(6)



Map created on 04042011 0200 JST

Name: NIT 24hrsMonitoringResults 03Apr2011 0100

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Nuclear Incident Team DOE NIT

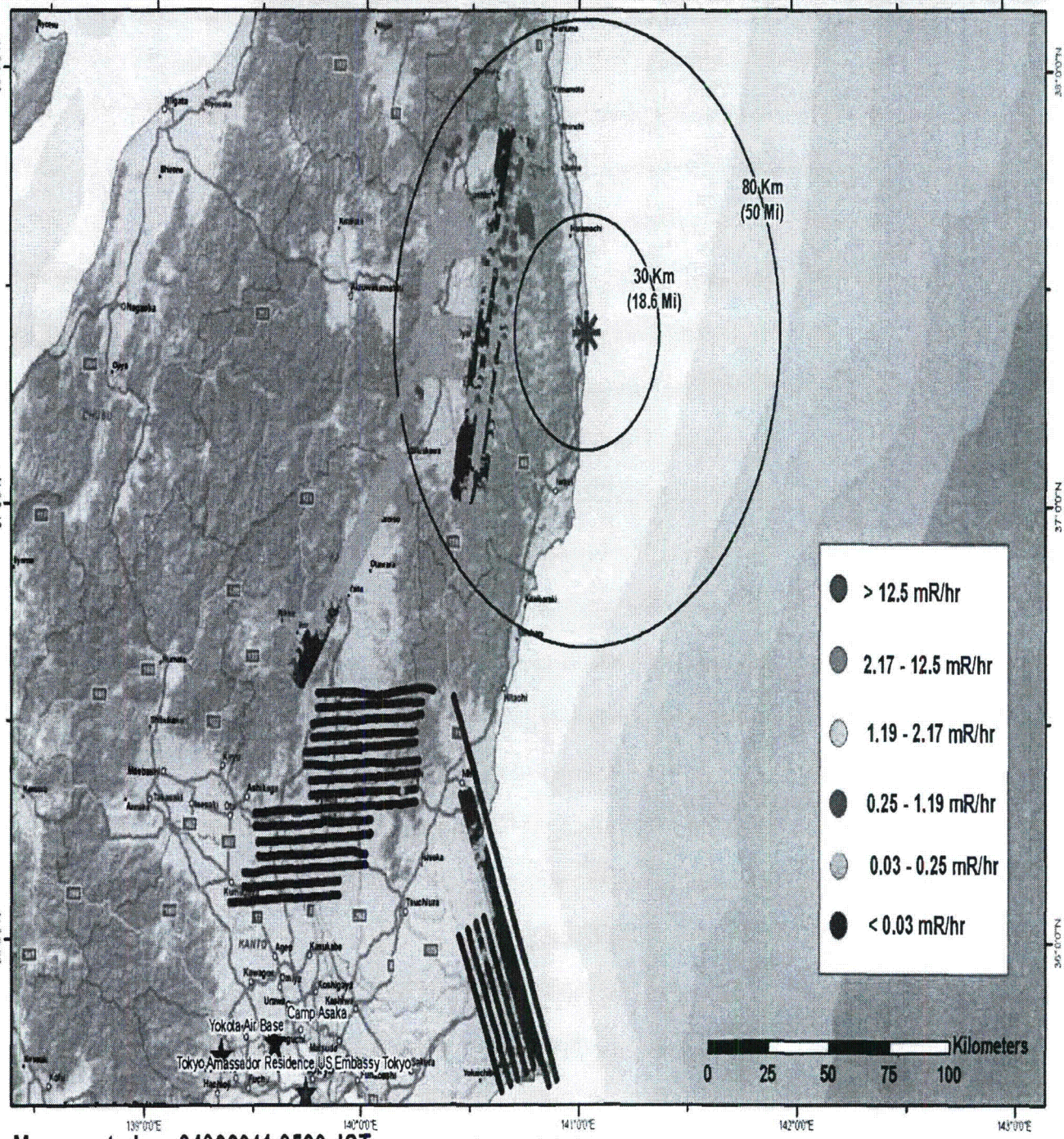
Contact (b)(6)

Aerial Monitoring Results

Combined Flights (April 01 and April 02, 2011)

FUKUSHIMA DAIICHI
JAPAN

National Nuclear Security Administration



Map created on 04032011 0530 JST

Name: NIT Combined Flight Results 01-02Apr2011

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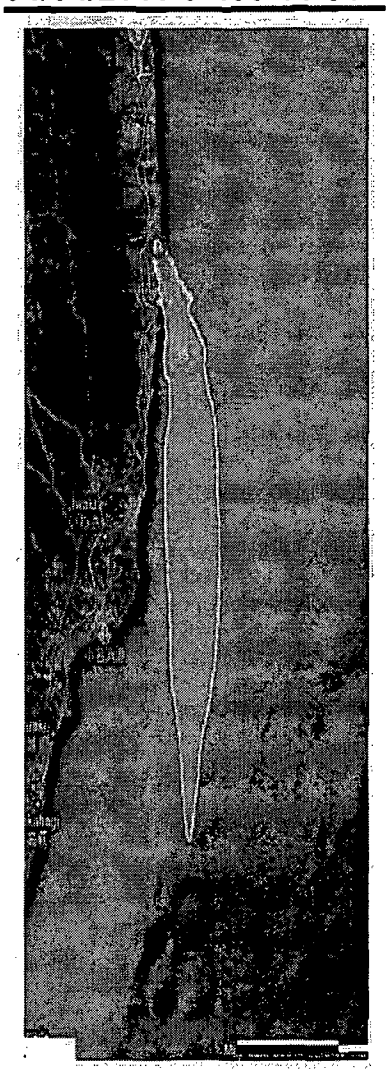
Nuclear Incident Team DOE NIT
Contact (b)(6)

Aerial and Ground Monitoring Data Assessment

- An assessment of measurements gathered through 3 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 3 April shows:
  - Radiation levels far below actionable levels for evacuation or relocation
  - All aerial measurements at US facilities were less than 32 μR/hr - a level that poses no known health risk
  - Monitoring of these locations will continue although no increases in deposited radiation are anticipated

Forecasted Weather
April 4, 2011

04/04/2011 07:00:00 JST



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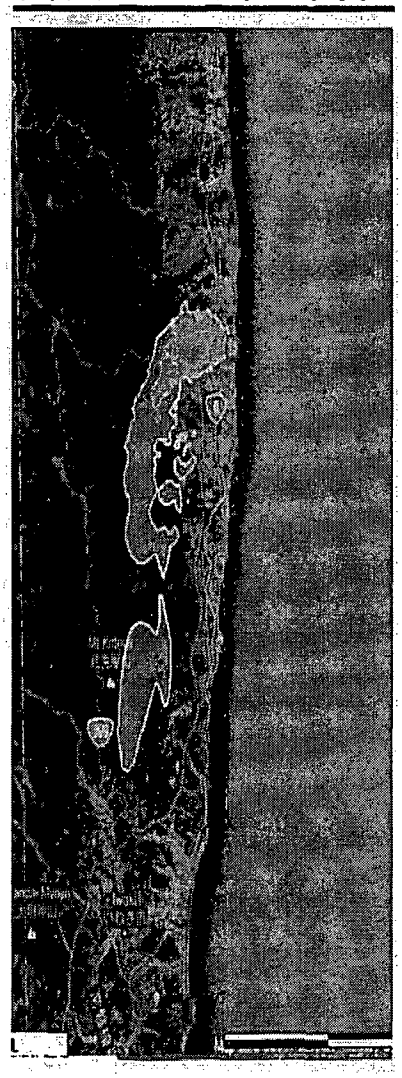

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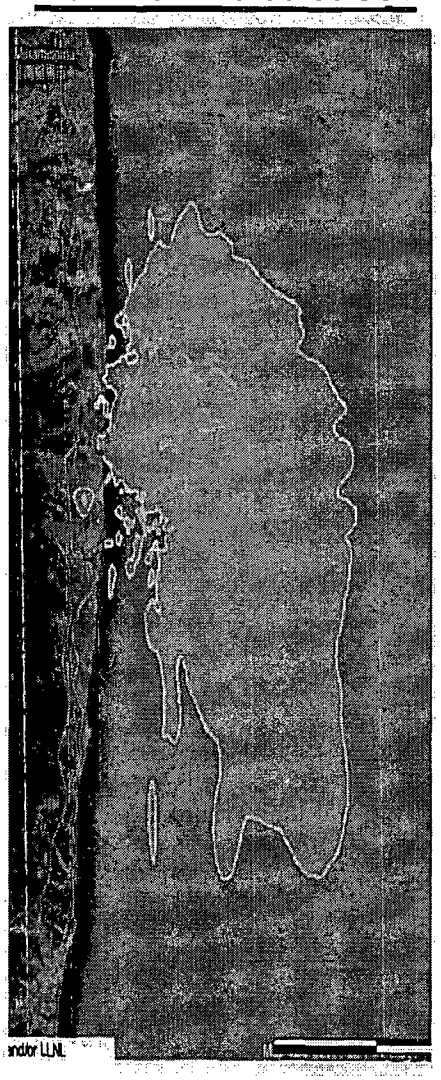
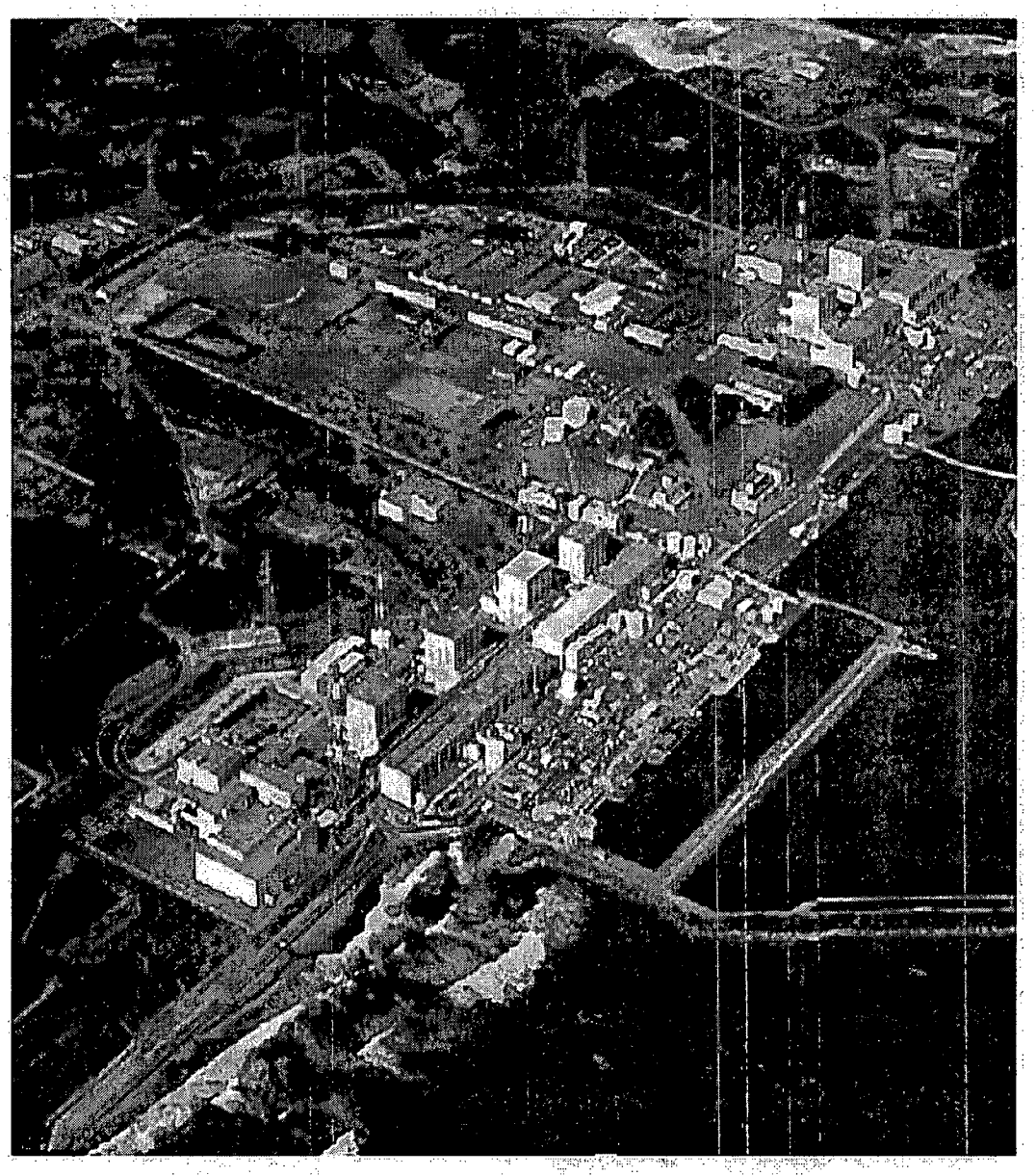


Planned Operations: Next 24 Hrs

- Aerial Monitoring
  - AMS UH-1: Planned re-flights along the eastern flanks of the mountains on the west side of the Tohoku Expressway valley north of Kortyama to the north side of Fukushima
  - AMS UH-1 (second aircraft available after 1100): UH-1, a second aircraft will be available after 1100, it will survey the coast south of Mito at 500ft with 1000 ft line spacings
  - AMS HH-60: Unavailable due to
  - AMS C-12: Continue to fly in the valley from the south near Shirasaka to the mountains on the west side, north to Shiroi east to the ocean.
- Ground Monitoring
  - Complete beta/gamma exposure rate surveys. Radio nuclide evaluations are to include in-situ measurement assessment of gamma isotopes.
- Continue joint Monitoring and Assessment planning with DoD (US AFRAT)
- Meeting (4 April) with MEXT on technical cooperation for monitoring and sampling

Japan Earthquake Response
April 3, 2011 // 0600 EDT



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Contact: DOE/NNSA Nuclear Incident Team: (b)(6)

Current Status

- No major changes in airborne radiation levels at the Fukushima Daiichi Power Plant
- Additional power plant status in accompanying text SITREP
  - 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%.. Spent fuel pool has been filled and fresh water injection has been reestablished after a brief suspension.
  - Unit 3: Reactor water level stable, core damage est. 33%. Freshwater injection continues; 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.
- Synthetic resin sprayed near reactor to fix contamination
- TEPCO continues to address issues with water in the trenches outside the 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. Rad levels in the pit exceed 1000 msV/hr. TEPCO is having difficulty patching the crack with concrete and an additional attempt will be made using a polymeric material with additional concrete on April 4.
  - 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.
- 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.

DOE/NNSA 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 (44)

Yokota AB

(2) SEO
(1) SEO Staff
(25) CMRT
(9) AMS

US Embassy Tokyo

(5) DART LNO
(1) Nuclear Energy Representative

USPACOM HQ

(1) LNO

Upcoming personnel changes:

Several personnel enroute to/from Japan 2-4 April.

Mission Summary

Type	Last 24 Hours	Total
AMS Flight Hours	Aircraft still in flight	196
Field Measurements	19,492	102,237
Air Samples	120 paper filters 120 charcoal filters	120 paper filters 120 charcoal filters
Soil Samples	1	1

Field measurements are a combination of DOE, DoD, and GOJ data including automated downloads from several remotely monitored stations. Figures accurate as of 0600 EDT 3 APR 11.

Significant Events: Past 24 Hrs.

International Engagement:

- GOJ Prime Minister's Office requested the Early Warning Line proposal come from a civilian ministry, vice MOD; DOE will try to coordinate with MEXT
- General Oriki visit to USFJ
- Coordinated further on GOJ ministries' requested support for sample analysis of food, soil, and water. Support will require sensitive detectors (High Purity Germanium), support equipment, and training

Nuclear Incident Team:

- Provided ground monitoring and aerial measuring data spreadsheets to CDC, FDA, HHS, USDA, EPA, NRC, DHS, NR, and WH
- Coordinated 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 and HH-60: Flew over US Military installations in and around the Tokyo area to provide information for USFJ to issue protective action guidance for dependents.
  - AMS C-12: Flew in the valley from the south near Shirasaka to the mountains on the west side, north to Shiroi, and east to the ocean.
  - 2 ground teams conducted surveys of military installations in the Tokyo area in support of the aerial mapping
  - 1 ground team took ground measurements on Yokota AB
- Medical Consult
  - Nothing substantial to report

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

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).

Guide to Interpretation

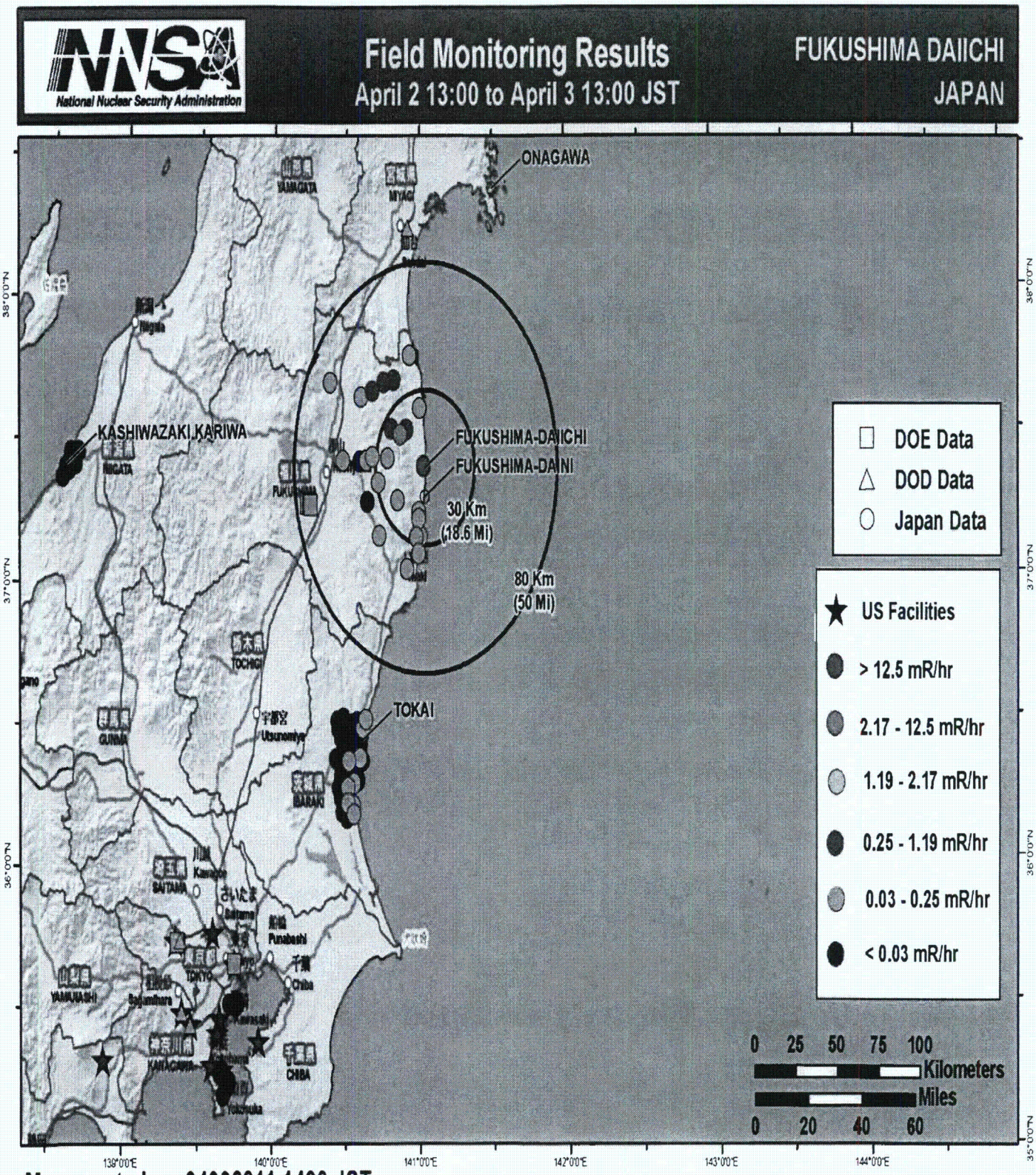
Areas at Risk for Agricultural Contamination

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.



Map created on 04032011 1430 JST

Name: NIT 24hrsMonitoringResults 02Apr2011 1300

UNCLASSIFIED

Nuclear Incident Team DOE NIT

Contac (b)(6)

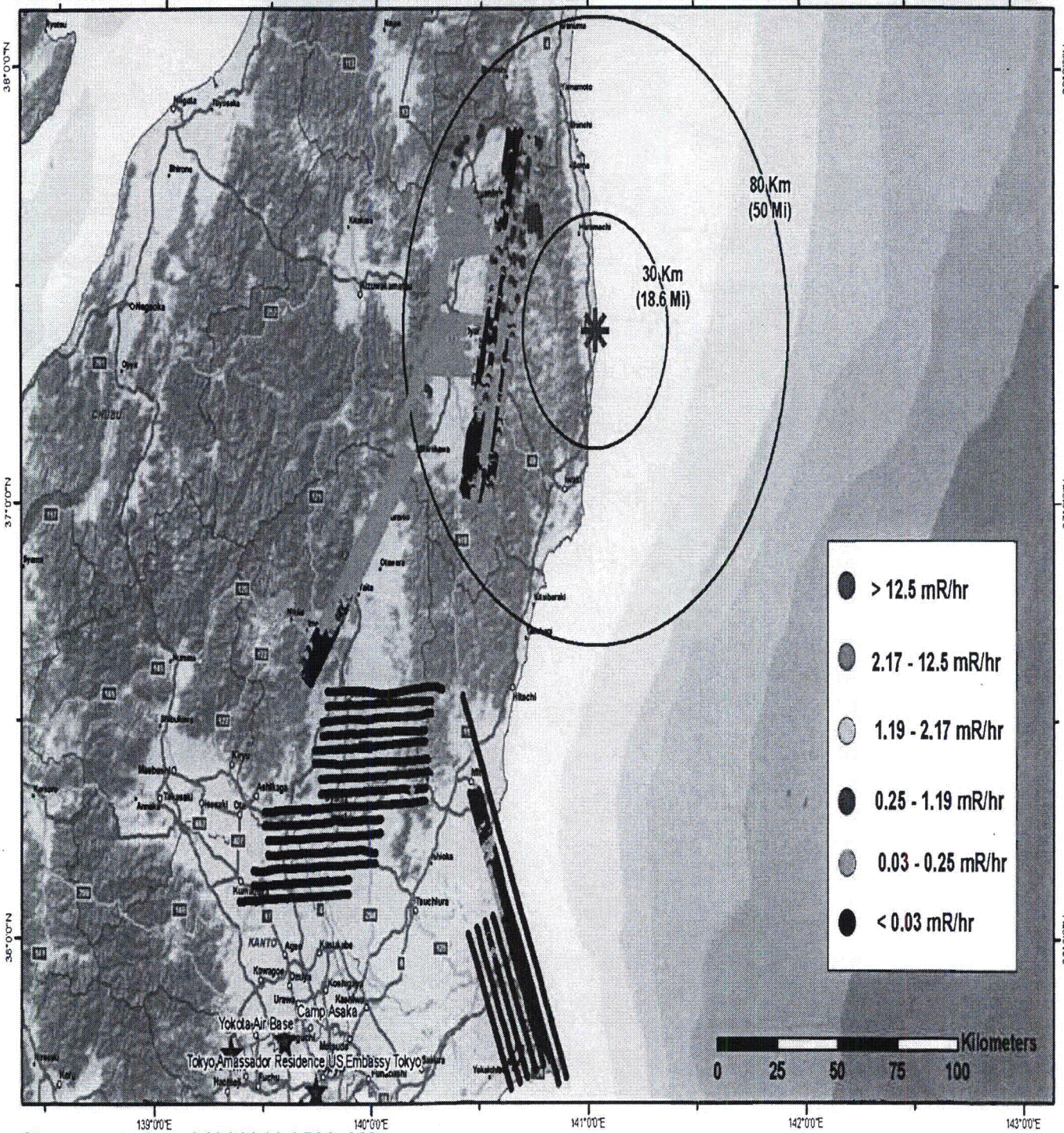
~~Official Use Only~~

Aerial Monitoring Results

Combined Flights (April 01 and April 02, 2011)

FUKUSHIMA DAIICHI
JAPAN

National Nuclear Security Administration



Map created on 04032011 0530 JST

Name: NIT Combined Flight Results 01-02Apr2011

UNCLASSIFIED

Nuclear Incident Team DOE NIT

Contact (b)(6)

~~Official Use Only~~

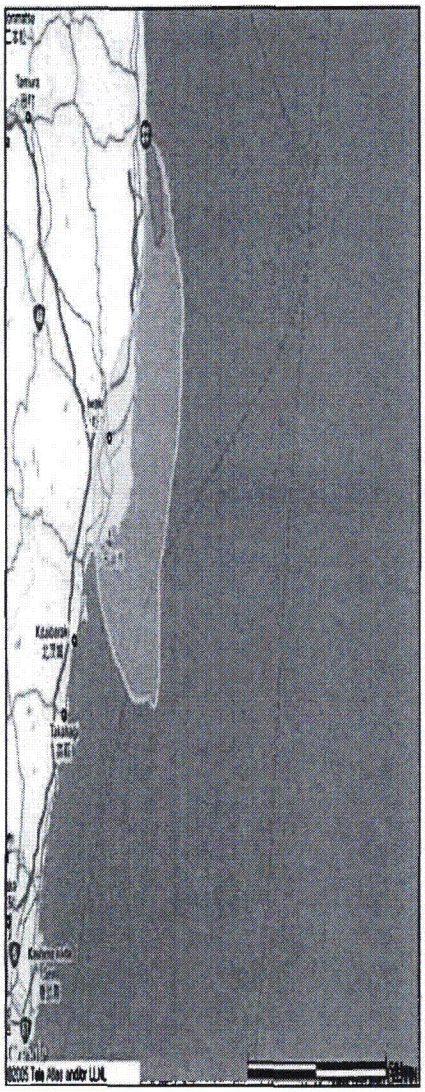
Aerial and Ground Monitoring Data Assessment

Assessment:

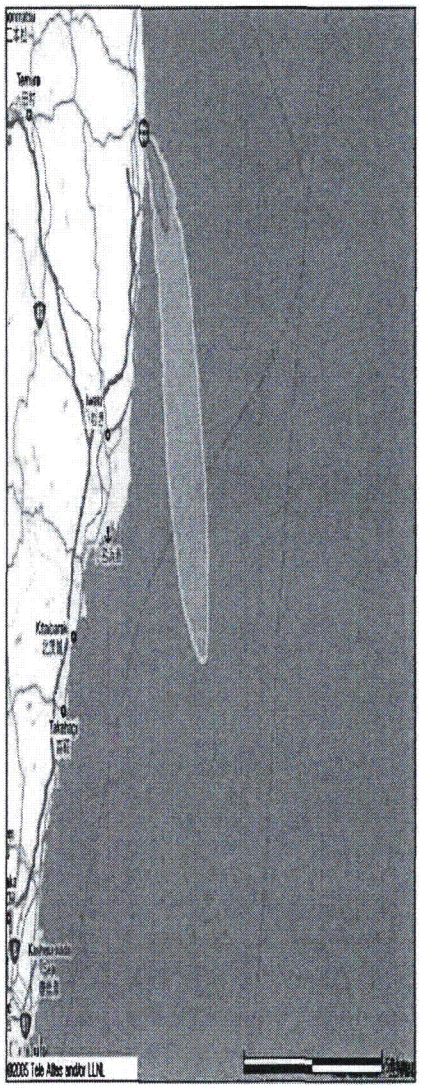
- An assessment of measurements gathered through 02 April continue to show:
  - Radiation levels consistently below actionable levels for evacuation or relocation outside of 25 miles
  - Radiological material has not deposited in significant quantities in the areas measured since 19 March

Forecasted Weather
April 4, 2011

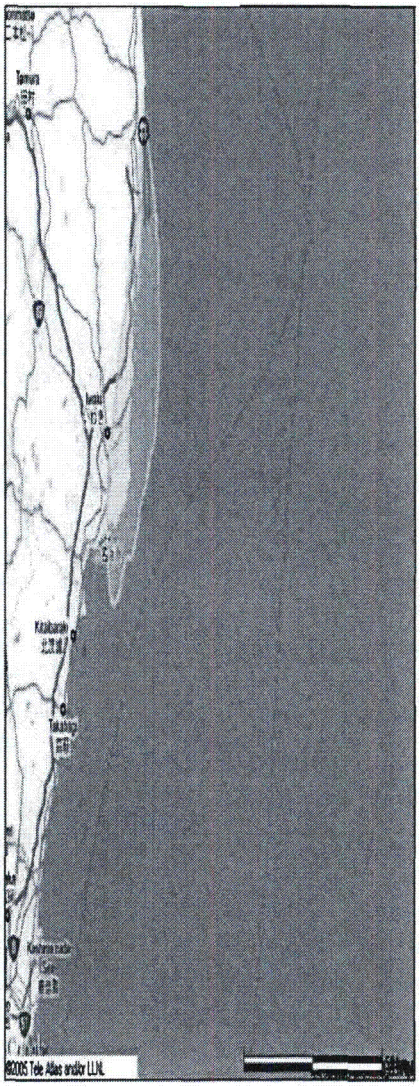
04/04/2011 02:00:00 JST



04/04/2011 07:00:00 JST



04/04/2011 16:00:00 JST



Planned Operations: Next 24 Hrs

- Aerial Monitoring
  - AMS UH-1: Aircraft not available tomorrow per USAF
  - AMS HH-60: TBD
  - AMS C-12: Continue to fly in the valley from the south near Shirasaka to the mountains on the west side, north to Shiroi east to the ocean.

- Ground Monitoring
  - Specific assignments TBD
  - Complete beta/gamma exposure rate surveys. Radio nuclide evaluations are to include in-situ measurement assessment of gamma isotopes.

- Continue joint Monitoring and Assessment planning with DoD (US AFRAT)
- Meeting (4 April) with MEXT on technical cooperation for monitoring and sampling

DEPARTMENT OF ENERGY SITUATION REPORT
Earthquake & Tsunami in Japan
4 April 2011
0600 (EDT) UPDATE

POWER PLANT UPDATE AND OTHER NUCLEAR ISSUES

Summary of information received as of 18:00 (EDT) 3 April from the Kyodo News. (NOTE: JST = EDT + 13 hours; EDT = GMT/UTC – 4 hours). A 20 cm crack was discovered on the concrete lateral of the pit (pit connected to the No. 2 reactor building). An initial attempt to block the leak was unsuccessful; therefore, a second attempt to block the leakage with a polymeric material as well as additional concrete was attempted on Sunday April 3, beginning at 13:40 JST. NISA has reported the absorbent did not reach the intended pipe and that so far there has been no decline in the amount of contaminated water leaking into the ocean. Engineers are now trying to mix the absorbent with water, and NISA will continue monitoring the situation until Monday to see if the technique yields positive results. (1800, 4/3 SITREP)

TEPCO reports that it is injecting a tracer to detect the path of radioactive water and Kyodo News details that TEPCO has poured 13 kilograms of the white powder tracer into an underground trench to find the point from where radioactive water is leaking into the Pacific Ocean in front of the plant, after its attempt to block the leakage from a cracked seaside pit connected to the No. 2 reactor turbine building showed no effect. (0600, 4/4 SITREP)

Reuters reports that TEPCO on Monday released low-level radioactive seawater that had been used to cool overheated fuel rods after it ran out of storage capacity for more highly contaminated water. According to the report, in all over 10,000 tons of contaminated water would be released. (0600, 4/4 SITREP)

Water has been filling up the basement of the No. 2 building and a tunnel-like underground trench connected to it. Kyodo news reported that per NISA spokesman, TEPCO has confirmed that pits from the plant's other reactors do not have similar cracks. Workers have also been checking the condition of the embankment at the plant on the coast to find out other possible routes for radiation leakage into the sea. TEPCO has revealed that radioactive iodine-131 more than 10,000 times the legal concentration was detected in the water found in the pit. TEPCO reports that work began at 13:55 PM JST on April 3 to drain water from the underground floor of the turbine buildings, transferring the water to a suppression pool water surge-tank in Unit 1. (1800, 4/3 SITREP)

Per the JAIF, TEPCO is obtaining a "massive, hollow floating platform" from Shizuoka City and will use it to store contaminated water from the Fukushima site. The float can store up to 18,000 tons of water. Meanwhile TEPCO and the Japanese government are working to identify safe methods for transporting and storing contaminated water. (18:00, 4/2 SITREP)

AR/8

Per IAEA, transfer of fresh water from the US Navy barge to the 'filtered water tank' near reactor No.1 started on April 1 at 15:38, and was suspended on April 1 around 17:00 due to a connection failure. JAIF reported on Sunday April 3 that a second US Navy barge carrying about 1,300 tons of fresh water arrived at the site on Saturday April 2. (1800, 4/3 SITREP)

Note: With the 18:00 March 31 SITREP we started labeling each entry 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)

Updates on Reactor Vessel Integrity:

No updates since 0600 4/1 SITREP. Per JAIF as of 0300 EDT April 1, it is presumed that radioactive material inside the reactor vessels may have leaked outside Units 1, 2 and 3. NISA announced that the reactor pressure vessel of Units 2 and 3 may have lost air tightness judging from the low pressure inside the pressure vessel. NISA reports that it is unlikely that these are cracks or holes in the reactor pressure vessels. (0600, 4/1 SITREP)

Updates on Cooling Efforts and Cooling Water Management:

Kyodo News reports Tepco plans to construct a large floating platform, a so-called "megafloat," to store the tainted water from the reactor. World Nuclear News reports that TEPCO plans to construct a 6000 tonne water tank as well as a 4000 tonne pond. These will work in conjunction with a 20 tonne per hour treatment facility to handle water from drainage canals around all six reactors at the plant. The tank and pond should be complete around the middle of this month, with the treatment facility following about two weeks later. The set-up should let the company mitigate the discharges to sea by safely storing and sampling the water and only discharging it after treatment. Kydo News reports that the amount of water detected in the plant has reached around 13,000 tons. (0600, 4/2 SITREP)

Near the No.4 reactor, 400 liters of a synthetic resin solution were sprayed in an experiment intended to solidify contaminated dust and prevent radioactive materials from getting airborne. Plant operator Tokyo Electric Power Company is due to test the solution for about 2 weeks to see if it works. (1800, 4/1 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)

Updates on Injuries and Exposure of Daiichi Workers:

From 3 April Kyodo news, TEPCO said that two workers in their 20s who have been missing were found dead in the basement of a reactor turbine building last Wednesday, March 30. They died of bleeding from multiple injuries resulting from the tsunami. This is the first time that TEPCO workers have been confirmed to have died at the plant. (0600, 4/3 SITREP)

TEPCO reports that at 11:35 JST April 1st, a TEPCO worker fell into the sea while stepping onto a ship from the pier during the hose laying work of the barge. He was immediately rescued. While no injury or contamination was confirmed, a full-body analysis will be performed to determine contamination (0600, 4/2SITREP)

Radiation Detection Updates:

NHK reports on Sunday April 3 that radiation levels on the ground in many areas near the Fukushima Daiichi nuclear plant are gradually decreasing. Chief 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)

Kyodo News reports that the Ministry of Health, Labor and Welfare said Sunday April 3 that it has detected radioactive substances higher than the legal limits in mushrooms sampled Friday in Iwaki, Fukushima Prefecture, where the crippled Fukushima Daiichi nuclear power plant is located. The Ministry said it found the mushrooms to contain 3,100 becquerels of radioactive iodine and 890 becquerels of radioactive cesium against the limits of 2,000 becquerels and 500 becquerels. (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)

Per NRC update 0430 EDT, 3 April, 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. IAEA confirms a no-fly zone out to 30 km around the Fukushima Daiichi plant. (0600, 4/3 SITREP)

Per a TEPCO press release, on April 2 at around 09;30 Japan time (JST), TEPCO employees detected water containing radiation dose over 1,000 mSv/h in a concrete pit where supply cables are stored near the intake channel of the Unit 2 reactor.

Per JAIF as of 0900 JST on April 4, radiation levels were 0.78mSv/h at the south side of the office building, 121μSv/h at the Main gate, 55μSv/h at the West gate, as of 09:00, Apr. 4rd. These are all slight decreases from previous JAIF report. (0600, 4/4 SITREP).

It was also discovered on April 2 that there is highly radioactive (more than 1000mSv/hr) water in the concrete structure housing electrical cable and this water is leaking into the sea (see detail in General item) (18:00, 4/2 SITREP)

JAIF reported as of 0800, March 31 that radioactive material in milk and agricultural products from Fukushima and neighboring prefectures. GOJ issued orders to limit shipment and intake for some products. Radioactive iodine exceeding the provisional legal limit was detected from tap water sampled in some prefectures from March 21 to 27. (0600, 4/1 SITREP)

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

Recent events of past 24 hours:

Per NRC update 0430 EDT, 3 April, current meteorological data (at 0200 EDT, 4/3) indicate that the winds are from the NW and are predicted to shift from the SE for a few hours late in the evening, then from the NW through the morning of 4/4. (0600, 4/3 SITREP)

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. (1800, 4/3 SITREP)

Field Monitoring and Assessment

- Continued monitoring activities at the US Embassy Japan (0600, 4/4 SITREP)
  - AMS UH-1 (1): Flew along eastern flanks of mountains on west side of Tohuka Expressway north to Kortyama 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 Shiroi, 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 (1800, 4/3 SITREP)

Planned operations over the next 24 hours:

- Aerial Monitoring (0600, 4/4 SITREP)
  - 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 (0600, 4/4 SITREP)
  - 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.
- Continue joint Monitoring and Assessment planning with DoD (US AFRAT)
- Meeting (4 April) with MEXT on technical cooperation for monitoring and sampling.

Updates by Reactor Unit (Updated each SITREP)

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 8 m3/h using a pump powered with offsite electric power. (1800, 4/3 SITREP)
Per JAIF at 0000 JST 4 April, reactor parameters are: RPV pressure (A) 0.304 MPa Gauge (G), (B) 0.592 MPa G; water level 1.65/1.65 meters below the top of the fuel rods; containment vessel pressure 0.155 MPa absolute (abs); RPV feedwater nozzle 243.1 °C (0600, 4/4 SITREP)

As of April 1, 1100 JST water level in trench is 1.14m below floor level. (1800, 4/3 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. Intermittent steam-like substance emitting from SFP 1, 2, 3, 4 from injection/spray. (Source: JAIF) (0600, 4/3 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 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 9 m3/h using a pump powered with offsite electric power. (1800, 4/3 SITREP)

Per JAIF 0000 JST 4 April, RPV pressure (A) -0.011 MPa G, (B) -0.014 MPa G; water level 1.50 meters below the top of the fuel rods; containment vessel pressure 0.105 MPa abs. Per IAEA as of 1715 UTC April 3, the indicated temperature at the feed water nozzle of the RPV has decreased from 161 °C to 153 °C and bottom head is not reported. Per JAIF at 0000 JST 4 April SFP temperature is 56°C, a decrease of about 16°C from the previous measurement on April 2. (0600, 4/4 SITREP)

Per NRC update 0430 EDT, 3 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 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 7 m3/h using a pump powered with offsite electric power. (1800, 4/3 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. (0600, 4/4 SITREP). Per IAEA at 1715 UTC on April 3, the indicated temperature at the feed water nozzle of the RPV is about 118 °C and at the bottom of RPV is about 92 °C. (1800, 4/3 SITREP)

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

No data is available for SFP pool water temperature as of this report.
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):
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.
Per NISA, freshwater spray to the Spent Fuel Pool using Concrete Pump Truck(50t/h) took place at 0825 UTC on April 1.

Fukushima Dai-ichi Unit 5 reactor (NRC priority 5):
Unit 5 was in a refueling outage at the time of the earthquake.
Unit #5 SFP contains 946 elements.
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 1600 JST 3 April, the SFP water temp was 30.9°C. (0600, 4/ SITREP)
Power was switched to off-site power on March 21.

Fukushima Dai-ichi Unit 6 reactor (NRC priority 6):
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.
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.
Per JAIF, as of 1600 JST 3 April, SFP water temp was 30.5°C. (0600, 4/4 SITREP)
Power supply to Unit 6 was switched from to temporary power to permanent supply on March 25.

Fukushima Daiichi Common Spent Fuel Pool

At 100 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, and the temperature was 39 °C as of 0800 JST 27 March.
The IAEA also reported on March 30th, 2011 that the Common Spent Fuel Pool temperature remains stable.

Other Information

The IAEA has announced that it will hold a high-level conference on preliminary lessons learned from Fukushima on June 20-24, 2011. Information is available at www.iaea.org.

REQUESTS FOR US ASSISTANCE

TEPCO-NISA has requested six storage tanks and a trailer from DOE, and additional information about the transportation and usage at the Fukushima site. TEPCO-NISA also inquired as to whether DOE would be willing to send any more storage tanks (0600, 4/2 SITREP).

GOJ Prime Minister's Office requested the Early Warning Line proposal come from a civilian ministry--not the MOD. DOE will try to coordinate with MEXT on this issue. (0600, 4/2 SITREP)

GOJ Ministries have requested support for analysis of food, soil, and water samples. GOJ has requested additional HpGe detectors from DOE. (0600, 4/2 SITREP)

The GOJ has requested assistance from DOE in the handling and storage of contaminated water from at the Fukushima reactors. Secretary Chu has offered to provide equipment and capabilities at DOE sites to support the Fukushima water clean-up effort. TEPCO said they hope they can receive the six stainless steel horizontal storage tanks (16,000 gallons each) and high activity trailer (1000 gallon capacity) as soon as possible. Capabilities include existing pumps and storage tanks that can be deployed quickly, as well as resources that can be utilized to design and acquire systems for the safe handling and storage of contaminated water. (1800, 4/1 SITREP)

ENERGY INFRASTRUCTURE:

No further updates. (1800, April1 SITREP)

On 30 March, NISA issued a press release instructing nuclear plant operating companies to review safety plans and systems to ensure core and spent fuel cooling capability in case of tsunamis and/or station blackout conditions. Operating companies were requested to report on the status of their actions. Per this press release, NISA will verify these plans within one month.

CONTACTS WITH GOJ OFFICIALS:

An interagency group will be meeting on Monday, April 4 at 1900 JST with U.S. Embassy officials, DOE and NRC. Participants will include 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 include representatives from TEPCO, NISA, METI, MEXT, JSDF and the Nuclear Safety Commission. (1800, 4/1 SITREP)

Media Reports

"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

"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

"Radioactive Water Continues to Leak" (NHK, 16:21 UTC, April 3, 2011)

Japan's Nuclear and Industrial Safety Agency says there has been no change in the amount of radioactive water seeping from the Fukushima, despite efforts to inject a polymer into a cracked pit.
http://www3.nhk.or.jp/daily/english/03_22.html

"Several months needed to stop radiation from Fukushima plant: Gov't" (Kyodo, April 3, 2011)

The government expects that several months may be required before radioactive particles stop being released from the Fukushima Daiichi nuclear plant, Chief Cabinet Secretary Yukio Edano said Sunday.
http://english.kyodonews.jp/news/2011/04/82864.html

CONTACT INFORMATION:
Nuclear Incident Team in the Emergency Operations Center

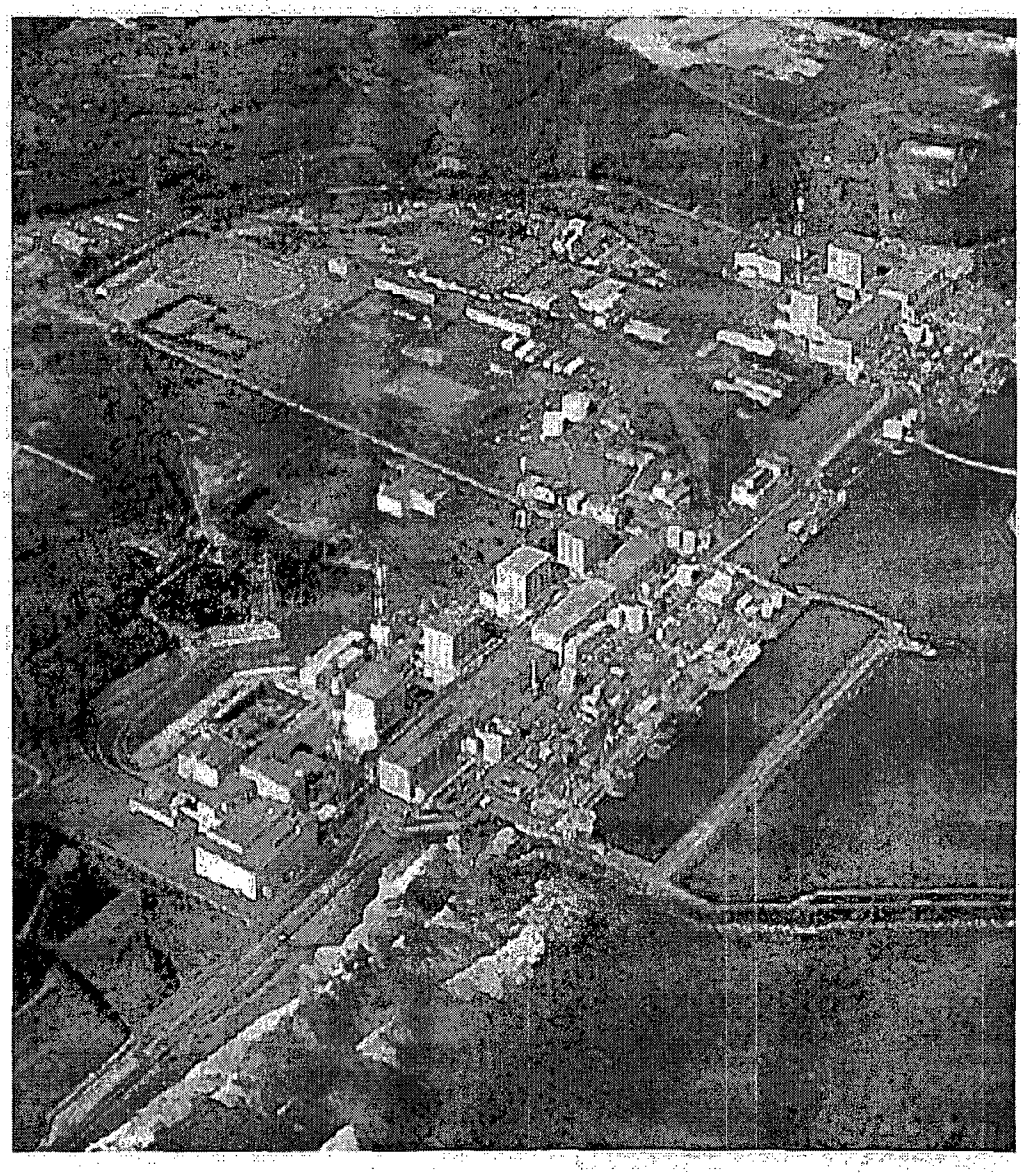
(b)(6)

Office of the Deputy Secretary 202-586-5500

Watch Schedule April 4:

Mark Whitney Brian Robinson	0400-0800/4 April
Karyn Durbin Michael Worley	1600-2000/4 April

Japan Earthquake Response
April 4, 2011 // 0600 EDT



AR/9

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)

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.
- 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.

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 exceeding1000 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.

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* (40)

Yokota AB

(2) SEO
(1) SEO Staff
(23) CMRT
(9) 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:

- 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, 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 Kortyama 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 Shiroi, 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

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

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).

Guide to Interpretation

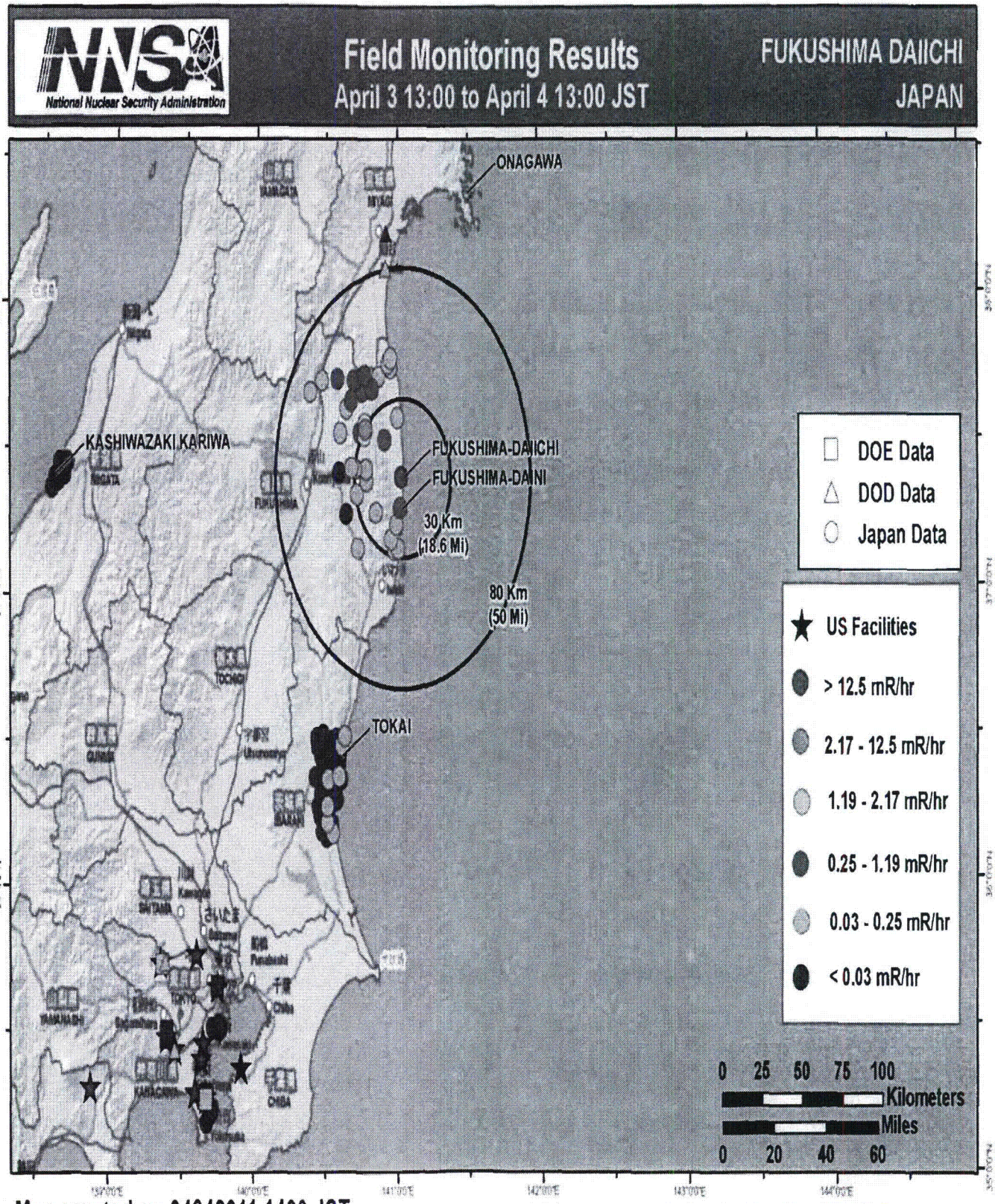
Areas at Risk for Agricultural Contamination

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.



Map created on 04042011 1430 JST

Name: NIT 24hrsMonitoringResults 03Apr2011 1300

UNCLASSIFIED

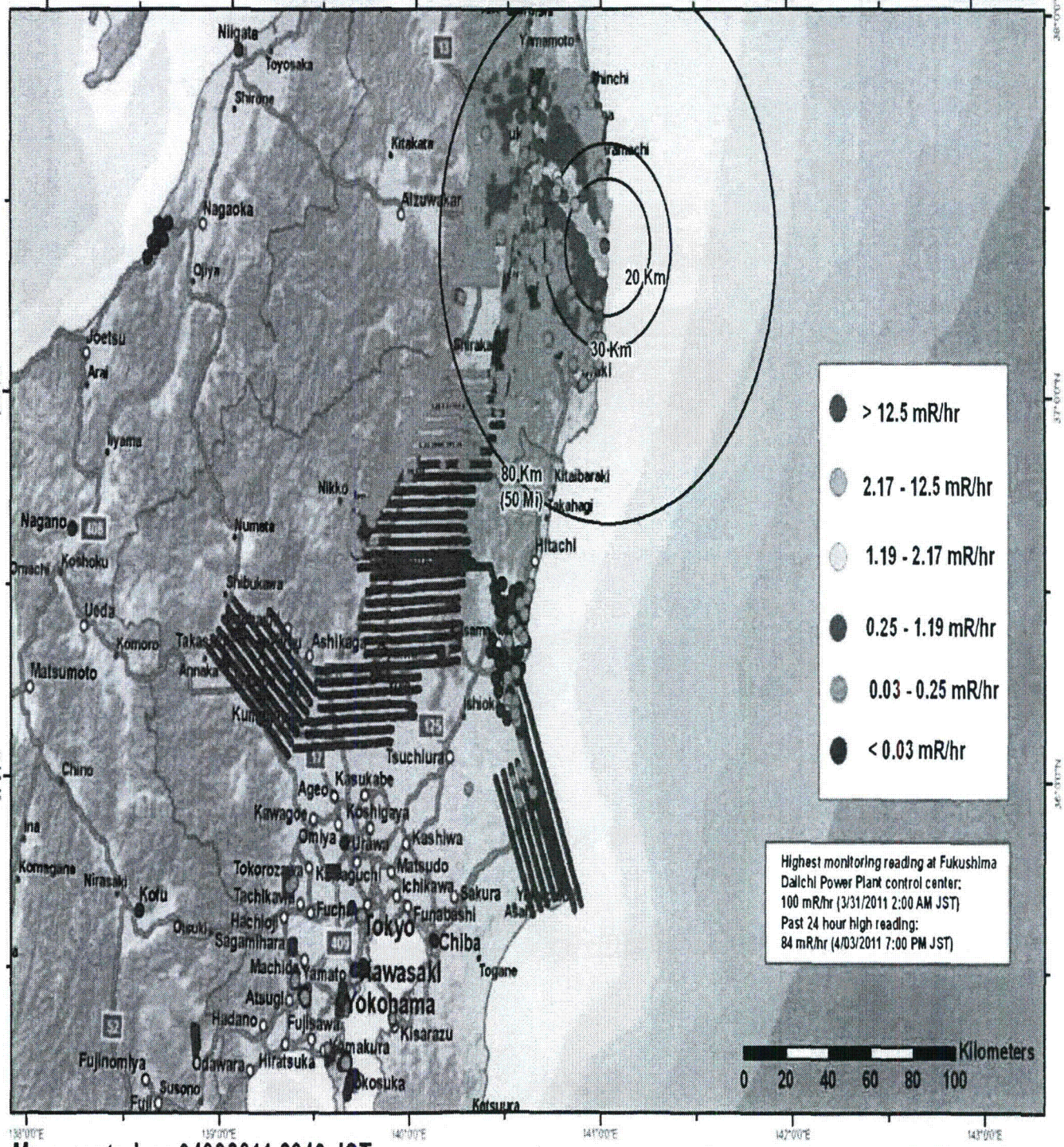
Nuclear Incident Team DOE NIT

Contact (b)(6)

Ground Based and Aerial Monitoring Results FUKUSHIMA DAIICHI JAPAN

Data from (March 30 - April 03)

National Nuclear Security Administration



Map created on 04032011 2340 JST

Name: NIT Combined Flights Ground Measurements 30Mar_03Apr2011 Results

UNCLASSIFIED

Nuclear Incident Team DOE NIT

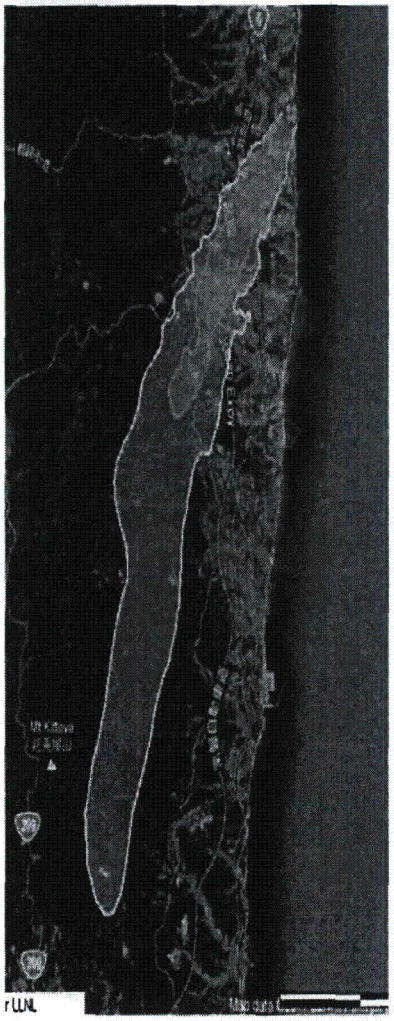
Contact (b)(6)

Aerial and Ground Monitoring Data Assessment

- An assessment of measurements gathered through 3 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 3 April shows:
  - Radiation levels far below actionable levels for evacuation or relocation
  - All aerial measurements at US facilities were less than 32 μR/hr - a level that poses no known health risk
  - Monitoring of these locations will continue although no increases in deposited radiation are anticipated

Forecasted Weather
April 4-5, 2011

04/04/2011 19:00:00 JST



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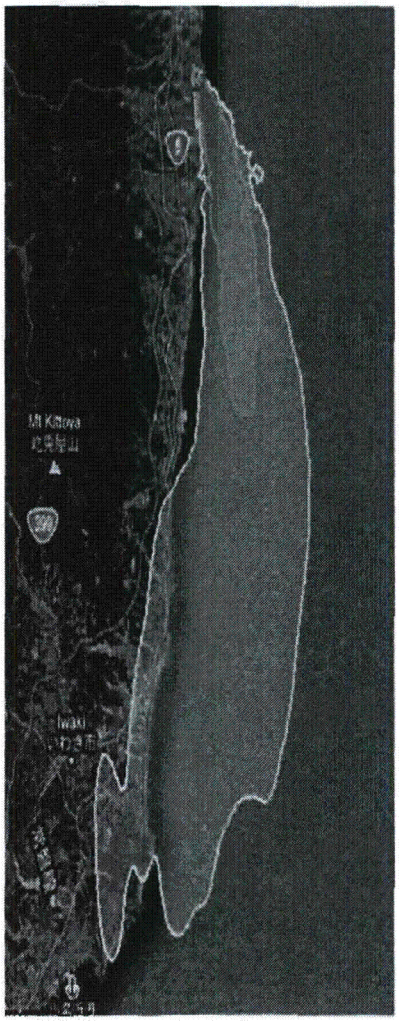

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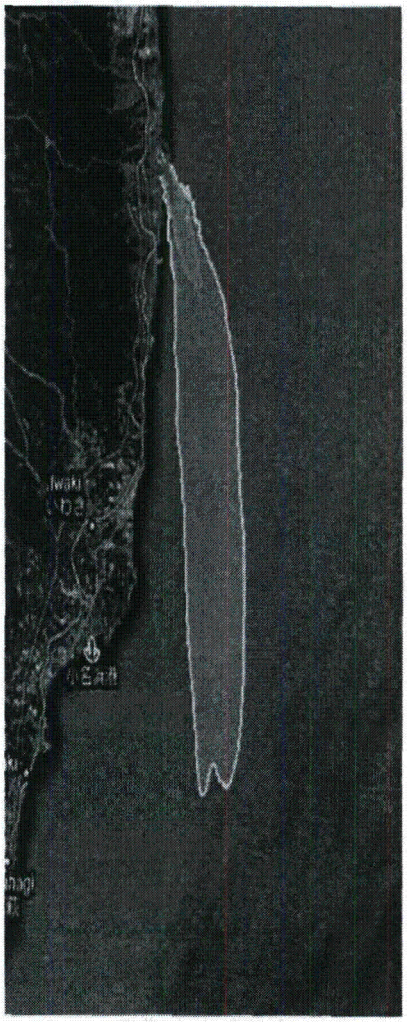

Planned Operations: Next 24 Hrs

- 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 Yokuska Naval Base.
  - Continuing work to implement the Early Warning Array utilizing Infields and SMC.

Planned Aerial/Field Monitoring Operations

April 5, 2011 Operational Period