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High radiation outside Japan exclusion zone: IAEA

2:00pm EDT

By Sylvia Westall and Fredrik Dahl

VIENNA (Reuters) - Radiation measured at a village 40 km from Japan's crippled nuclear plant exceeded a criterion for evacuation, the U.N. nuclear watchdog said on Wednesday, the latest sign of widening consequences from the crisis.

The finding could increase pressure on Japan's government to extend the exclusion zone beyond 20 km (12 miles) around the Fukushima power plant, which has leaked radioactive particles since it was hit by a huge earthquake and tsunami on March 11.

Criticized for weak leadership during Japan's worst crisis since World War Two, Prime Minister Naoto Kan has said he is considering enlarging the evacuation area to force 130,000 people to move, in addition to 70,000 already displaced.

"The first assessment indicates that one of the IAEA operational criteria for evacuation is exceeded in litate village," Denis Flory, a deputy director general of the International Atomic Energy Agency (IAEA), said.

"We have advised (Japan) to carefully assess the situation and they have indicated that it is already under assessment," he told a news conference.

Greenpeace this week said it had confirmed radiation levels in this village northwest of the plant high enough to evacuate. But Japan's nuclear safety agency on Monday rebuffed a call by the environmental group to widen the evacuation zone.

The IAEA also said it had been told by Singapore that some cabbages imported from Japan contained radioactive iodine above the levels recommended for international trade.

"Some samples were over the Codex Alimentarius values recommended for international trade," said Flory.

David Byron, a U.N. food agency official seconded to the IAEA, said the recommended level was 100 becquerels per kg and that one of the samples in Singapore was up to nine times above that. "Other samples were also over that level," he said, although not as much.

"NOT END OF THE WORLD"

IAEA Director General Yukiya Amano said the situation at the Fukushima plant remained very serious, despite increased efforts by authorities to get it under control.

Saying the Japanese authorities had faced additional difficulties but also experienced some successes, he said he had sent invitations to the IAEA's 151 member states for a ministerial nuclear safety meeting on June 20-24 in Vienna.

"It should be a forward-looking meeting," he said.

Amano had said on Monday he wanted IAEA member states to assess the response to Japan's nuclear emergency and discuss ways to prevent such a disaster happening again, adding that the international community needed a coordinated response.

The disaster has prompted a rethink of nuclear power around the world, just as the technology was starting to regain momentum as a way to fight global warming.

Hundreds of engineers have been toiling for nearly three weeks to cool the Fukushima plant's reactors and avert a catastrophic meltdown of fuel rods, although the situation appears to have moved back from that nightmare scenario.

In a potentially negative development, Flory said the agency had heard there might be "recriticality" at the plant, in which a nuclear chain reaction would resume, even though the reactors were automatically shut down at the time of the quake.

That could lead to more radiation releases, but it would not be "the end of the world," Flory said. "Recriticality does not mean that the reactor is going to blow up. It may be something really local. We might not even see it if it happens."

(Editing by Mark Heinrich)

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IAEA.org
International Atomic Energy Agency

Fukushima Nuclear Accident Update Log

Updates of 30 March 2011

Staff Report

→ Chronology of Daily Updates:

30 March | 29 March (<http://domain.com/newscenter/news/2011/fukushima290311.html>) | 28 March
(<http://domain.com/newscenter/news/2011/fukushima280311.html>) | 27 March
(<http://domain.com/newscenter/news/2011/fukushima270311.html>) | 26 March
(<http://domain.com/newscenter/news/2011/fukushima260311.html>) | 25 March
(<http://domain.com/newscenter/news/2011/fukushima250311.html>) | 24 March
(<http://domain.com/newscenter/news/2011/fukushima240311.html>) | 23 March
(<http://domain.com/newscenter/news/2011/fukushima230311.html>) | 22 March
(<http://domain.com/newscenter/news/2011/fukushima220311.html>) | 21 March
(<http://domain.com/newscenter/news/2011/fukushima210311.html>) | 20 March
(<http://domain.com/newscenter/news/2011/fukushima200311.html>) | 19 March
(<http://domain.com/newscenter/news/2011/fukushima190311.html>) | 18 March
(<http://domain.com/newscenter/news/2011/fukushima180311.html>) | 17 March
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(<http://domain.com/newscenter/news/2011/fukushima160311.html>) | 15 March
(<http://domain.com/newscenter/news/2011/fukushima150311.html>) | 14 March
(<http://domain.com/newscenter/news/2011/fukushima140311.html>) | 13 March
(<http://domain.com/newscenter/news/2011/fukushima130311.html>) | 12 March
(<http://domain.com/newscenter/news/2011/fukushima120311.html>) | 11 March
(<http://domain.com/newscenter/news/2011/fukushima110311.html>) | Full Update
(<http://domain.com/newscenter/news/2011/fukushimafull.html>)



IAEA Briefing on Fukushima Nuclear Accident (30 March 2011, 16.30 UTC)

On Wednesday, 30 March 2011, the IAEA provided the following information on the current status of nuclear safety in Japan.

1. Current Situation

Overall at the Fukushima Daiichi plant, the situation remains very serious.

With respect to the water that is present in the turbine buildings. In **Unit 1**, water has continued to be pumped into the condenser with 3 pumps (6.5 ton/hour each) and the water level has reduced from 40cm to 20cm. In **Unit 2** from 07.45 UTC, pumping of water from the Condensate Storage Tank into the Surge Tank was started so that the that condenser can be drained to the Condensate Storage Tank and contaminated water can be pumped out from the Turbine building into the condenser. The same process of pumping the water from the Condensed Water Storage Tank into the Surge Tank was started on **Unit 3** at 08.40 UTC on March 28.

Near the **Unit 3** building, 3 workers spilled water over themselves when removing a flange from seawater pipes on the residual heat removal system (RHR). After showering, contamination was not detected.

Fresh water has been continuously injected into the Reactor Pressure Vessel (RPV) through feed-water line at an indicated flow rate of 8.0 m³/h at **Unit 1**. The pumping of freshwater into the RPV has been switched from fire trucks to temporary electrical pumps with diesel generator. At **Units 2 and 3** fresh water is being injected continuously through the fire extinguisher line at an indicated rate of 7 m³/h using a temporary electric pump.

The indicated temperature at the feed water nozzle of the RPV of **Unit 1** has decreased from 323 °C to 281 °C and at the bottom of RPV remained stable at 134 °C. There is a corresponding decrease in Drywell pressure. At **Unit 2** the indicated temperature at the feed water nozzle of the RPV has increased from 154 °C to 177 °C and at the bottom of RPV has increased from 78 °C to 88 °C. Indicated Drywell pressure remains at atmospheric pressure. For **Unit 3** the indicated temperature at the feed water nozzle of the RPV is about 75 °C and at the bottom of RPV is about 116 °C. The validity of the RPV temperature measurement at the feed water nozzle is still under investigation.

With respect to the Spent Fuel Pools. It was planned to commence the pumping of water into the **Unit 1** Spent Fuel Pool by concrete pumping truck from 29 March. Also on 29 March pumping of fresh water into the **Unit 2** spent fuel pool commenced via a temporary electrical pump. The temperature of the spent fuel pool is 46 °C as of 19:00 UTC 29 March. For **Unit 4** it was planned to commence pumping freshwater into the spent fuel pool on March 29. The IAEA has not received information on implementation of spraying activities in units 1 and 4.

Units 5 and 6 remain in cold shutdown

2. Radiation Monitoring

The majority of the recently measured radioactivity levels in drinking water are being reported below the levels established by the Japanese authorities which are 100 Bq/L of I-131 for infants; 300 Bq/L for adults and 200 Bq/L of Cs-137 for infants and adults. Previously imposed recommendations for restrictions on drinking water are being lifted in most of the affected locations. As of 28 March, recommendations for restrictions based on I-131 concentration remain in place in one village in the Fukushima prefecture. In three other locations of the Fukushima prefectures, restrictions continue to apply for infants only.

Two IAEA teams are currently monitoring radiation levels and radioactivity in the environment in Japan. On 29 March, one team made gamma dose-rate measurements in the Tokyo region at 8 locations. Gamma-dose rates measured ranged from 0.02 to 0.19 microsievert per hour, which is within or slightly above the background.

The second team made additional measurements at distances of 32 to 62 km, at directions North to Northwest from the Fukushima nuclear power plant. At these locations, the dose rates ranged from 0.5 to 6.8 microsievert per hour. At the same locations, results of beta-gamma contamination measurements ranged from 0.05 to 0.45 Megabecquerel per square metre.

Based on measurements of I-131 and Cs-137 in soil, sampled from 18 to 26 March in 9 municipalities at distances of 25 to 58 km from the Fukushima Nuclear Power Plant, the total deposition of iodine-131 and cesium-137 has been calculated. The results indicate a pronounced spatial variability of the total deposition of iodine-131 and cesium-137. The average total deposition determined at these locations for iodine-131 range from 0.2 to 25 Megabecquerel per square metre and for cesium-137 from 0.02-3.7 Megabecquerel per square metre. The highest values were found in a relatively small area in the Northwest from the Fukushima Nuclear Power Plant. First assessment indicates that one of the IAEA operational criteria for evacuation is exceeded in Iitate village. We advised the counterpart to carefully access the situation. They indicated that they are already assessing.

As far as food contamination is concerned, 35 samples taken from 25-29 March, and reported on 29 March, for various vegetables, fruit (strawberry), seafood, pork and unprocessed raw milk in nine prefectures (Chiba, Gunma, Ibaraki, Kanagawa, Nagano, Niigata, Saitama, Tochigi and Yamagata), stated that results for iodine-131, caesium-134 and caesium-137 were either not detected or were below the regulation values set by the Japanese authorities.

The Joint FAO/IAEA Food Safety Assessment Team met with local government officials in Tochigi prefecture on 29th March and provided advice related to contamination of food and the environment.

Local government officials briefed the FAO/IAEA Team on the extent of contamination in Tochigi, the principle agricultural products affected, the main production areas and production methods (greenhouses, open-air), levels of contamination found (principally in air, tap/ground water and vegetables) and imminent plans to monitor soil contamination. A field visit also took place to a spinach producer outside Utsunomiya City.

Based on these latest discussions with the Tochigi authorities, it is apparent that the focus of the Joint FAO/IAEA mission has changed to some extent from the mechanisms of contamination to remediation strategies and techniques related to plant and animal production, food traceability and water/soil characterization.

The FAO/IAEA team is also meeting with the local government officials in Gunma prefecture today.

No new results from the marine monitoring stations 30 km off-shore as well as from close to the discharge, were reported since 27 March.

One IAEA staff member of the Monaco marine laboratory will fly to Japan on 31 March in order to join the Japanese team assessing marine environment.

The IAEA continues activities under the Joint Radiation Emergency Management Plan of the International Organisations through regular video/teleconferences. As of March 30 the WHO liaison officer is working in the IEC.

In response to the request for data on measurement, the IEC has received information from Singapore. The Singapore Authorities have sent reports on measurements in food imported from Japan (cabbages). Some samples were over the Codex Alimentarius values recommended for international trade. In Singapore no increase in gamma dose rates have been observed and no fission products have been found in air samples.

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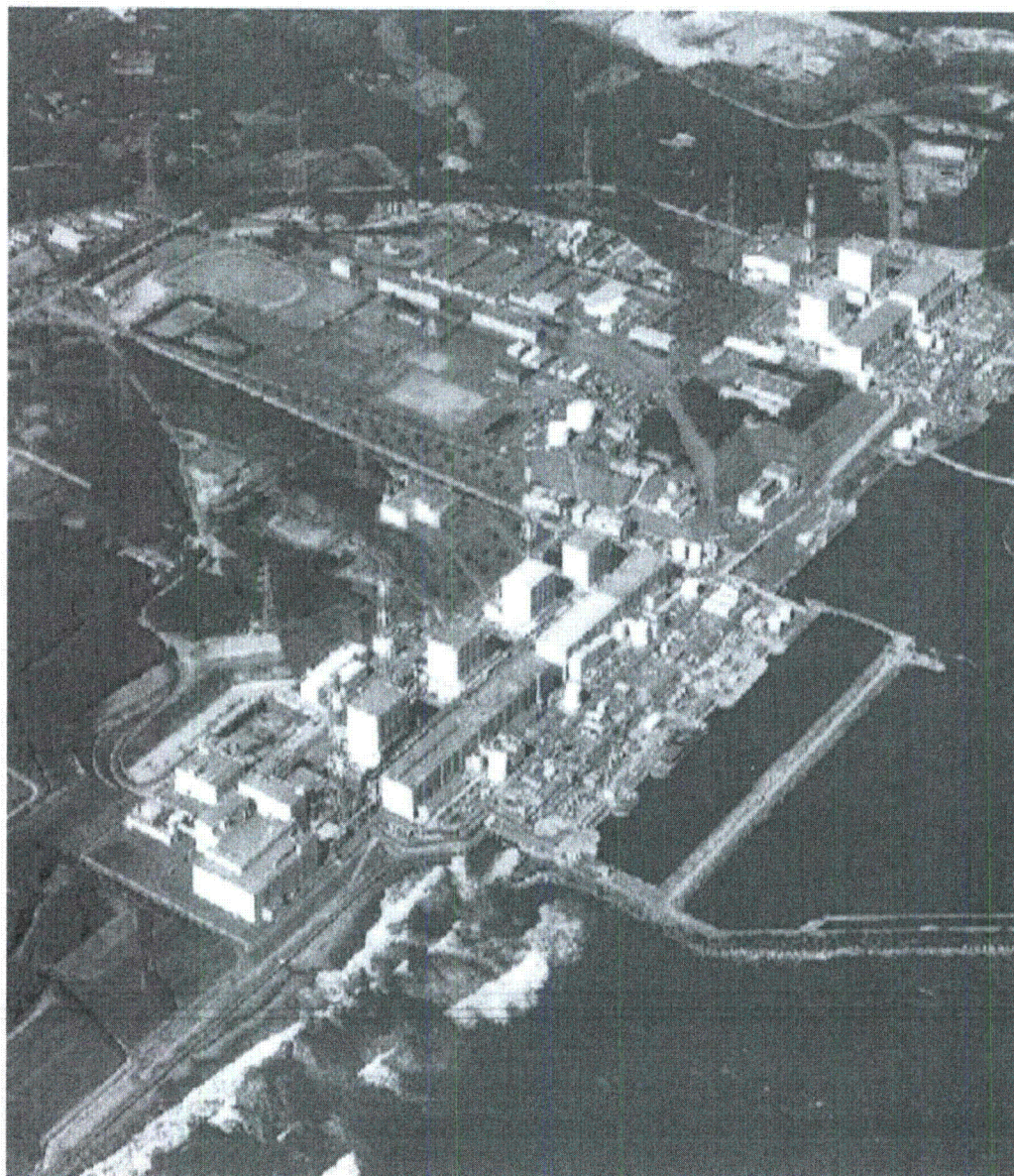
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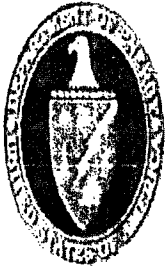
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Japan Earthquake Response

April 5, 2011 // 0600EDT



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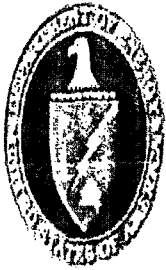


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Current Status

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

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DOE/NNSA Emergency Response

♦ Command, Control, Coordination:

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

♦ Modeling

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

♦ Monitoring and Sampling

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

♦ Assessment

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

♦ Medical Consultation

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

Deployed* (39)

Yokota AB

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

US Embassy Tokyo

- (4) DART LNO

USPACOM HQ

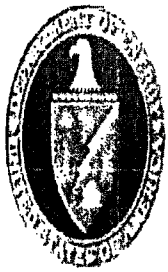
- (1) LNO

Upcoming personnel changes:

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

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

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Significant Events: Past 24 Hrs.

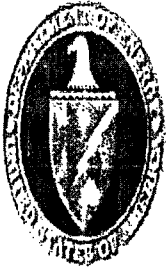
International Engagement:

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

Nuclear Incident Team:

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

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Significant Events: Past 24 Hrs.

Operations:

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

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Data Inputs

(as of 6 Apr)

Monitoring

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

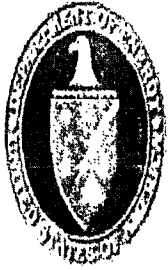
Sampling

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

Organizations Providing Data

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

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Guide to Interpretation

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

■ Early Phase DRL

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

First Year DRL

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

Fifty Year DRL

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

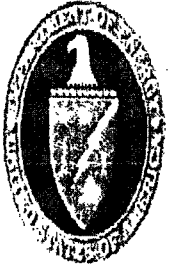
Second Year DRL

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

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

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

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Guide to Interpretation

Areas at Risk for Agricultural Contamination

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

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

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

◆ Areas 10 to 100 times historical background are indicated by green.

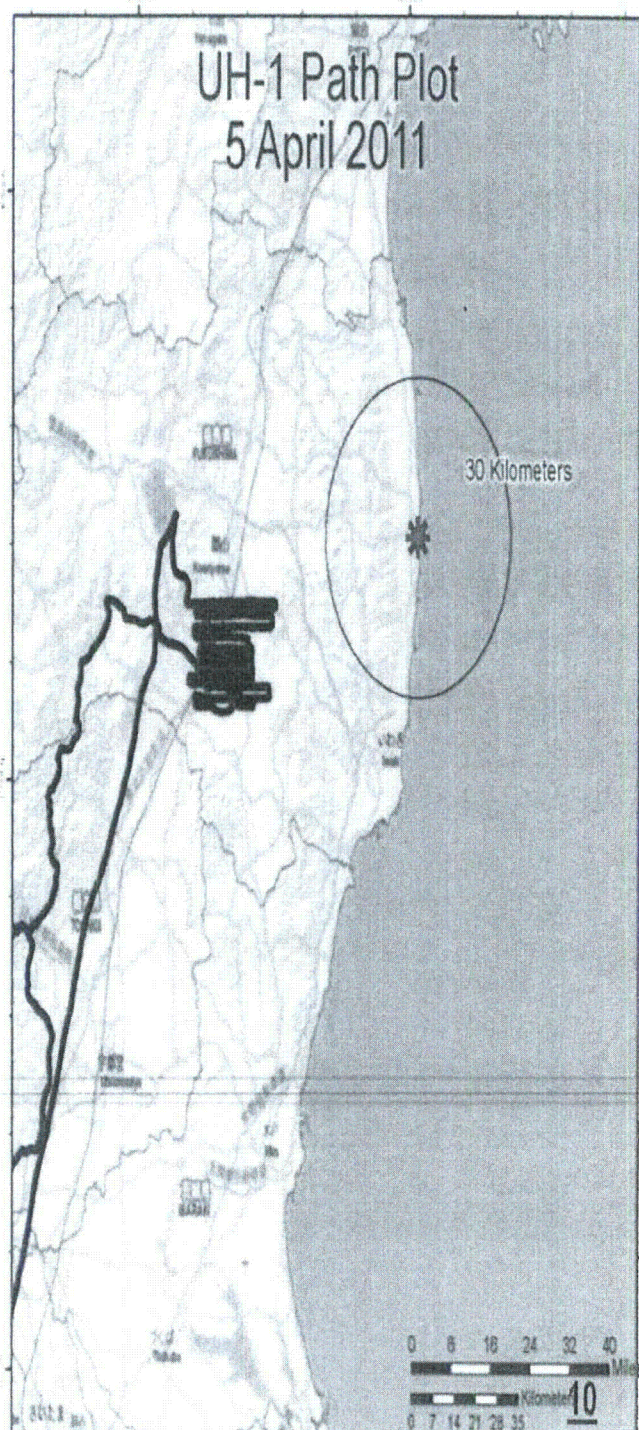
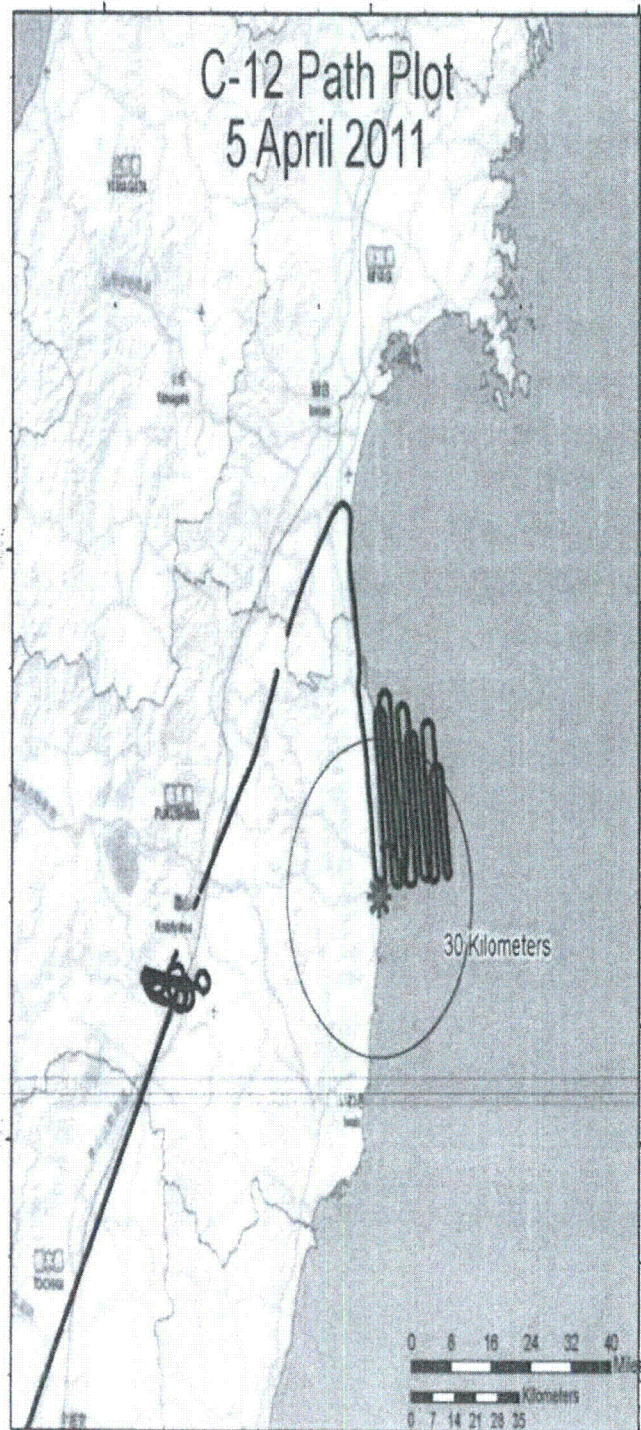
◆ Areas 2 to 10 times historical background are indicated by light blue.

◆ Areas at or near historical background are indicated by dark blue.



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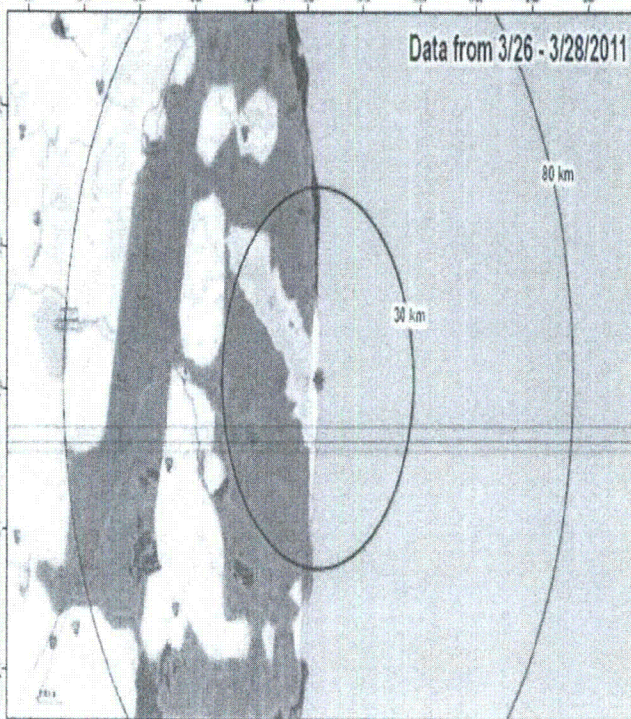
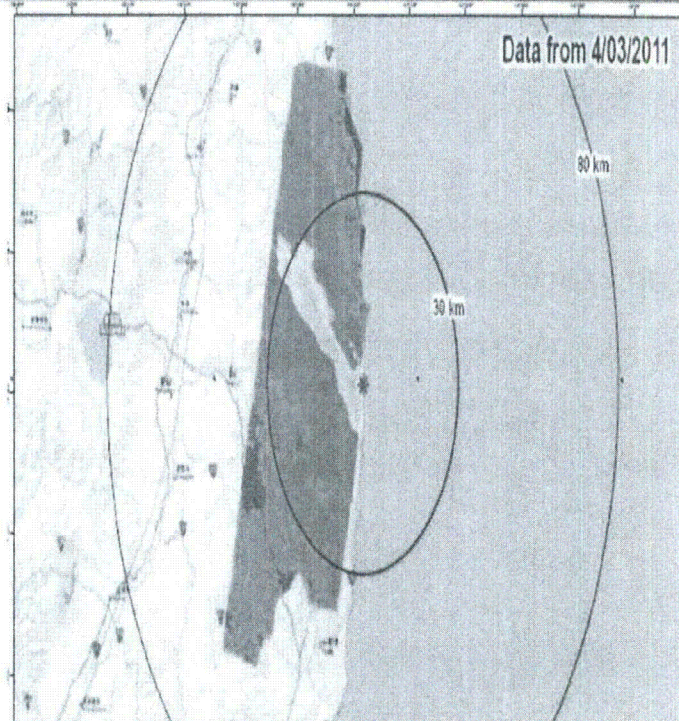
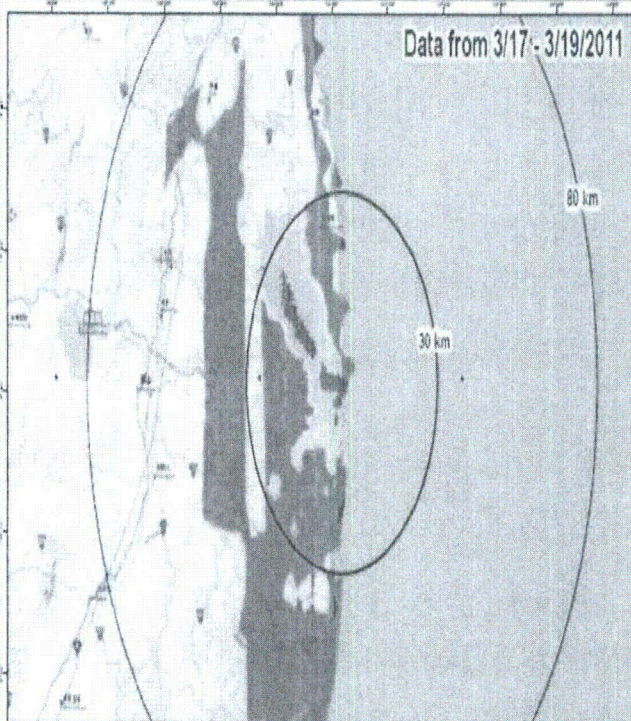
Flight Path Map



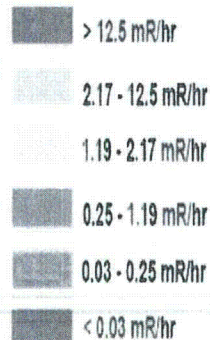
Aerial Monitoring Survey Areas

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

FUKUSHIMA DAIICHI
JAPAN



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

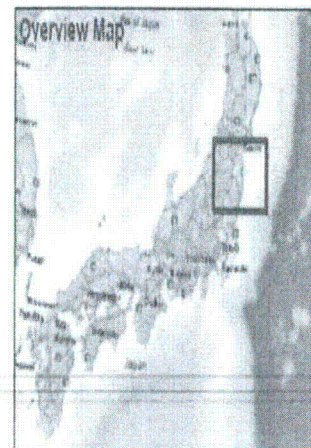


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This map was produced by the Geographic Information Systems department of NSA's Remote Sensing Laboratory (RSL) at Nellis AFB, Las Vegas, Nevada. HSIP Gold 2010, ESRI World Street Map, and CMHT databases were used for map generation.

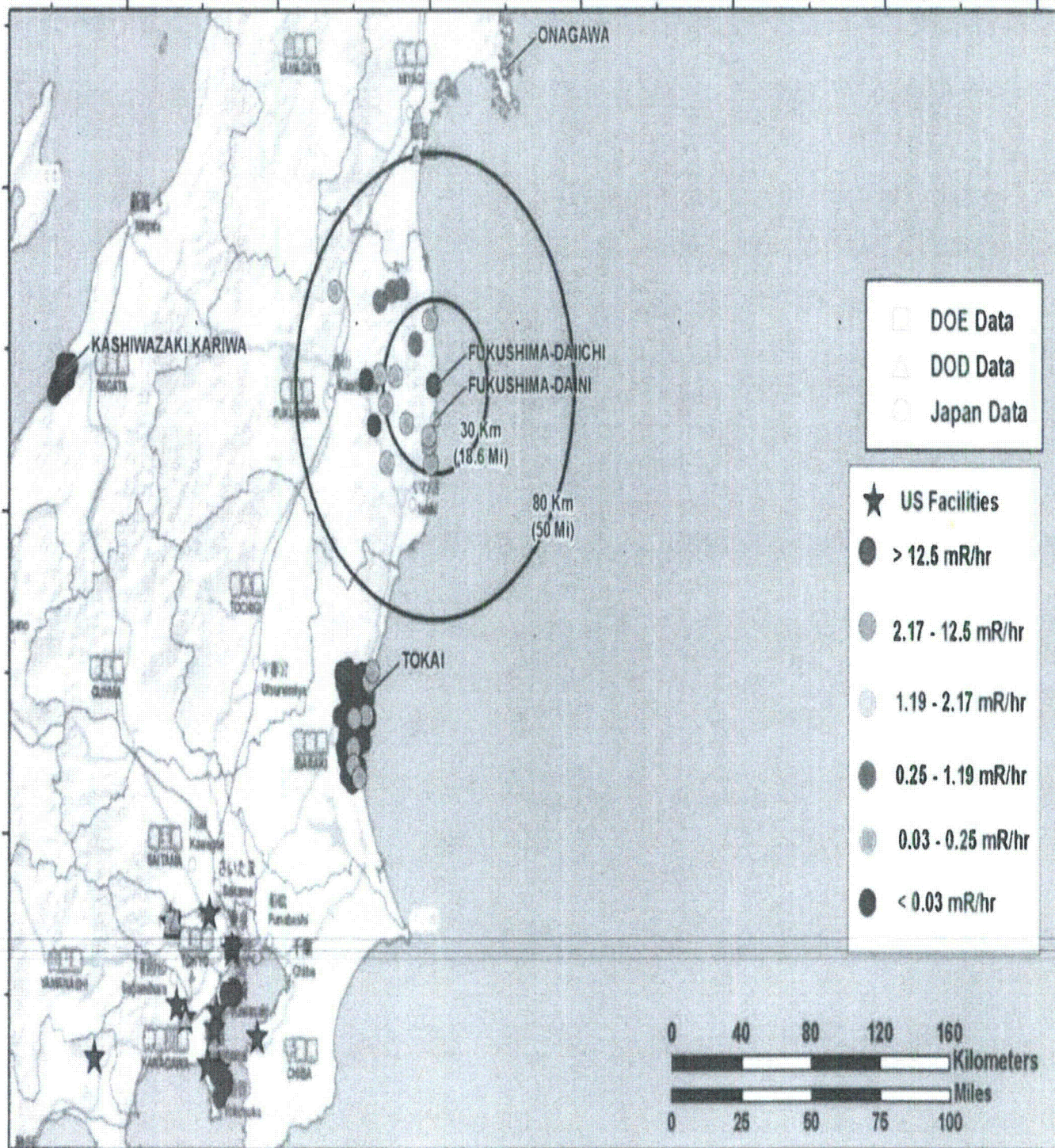
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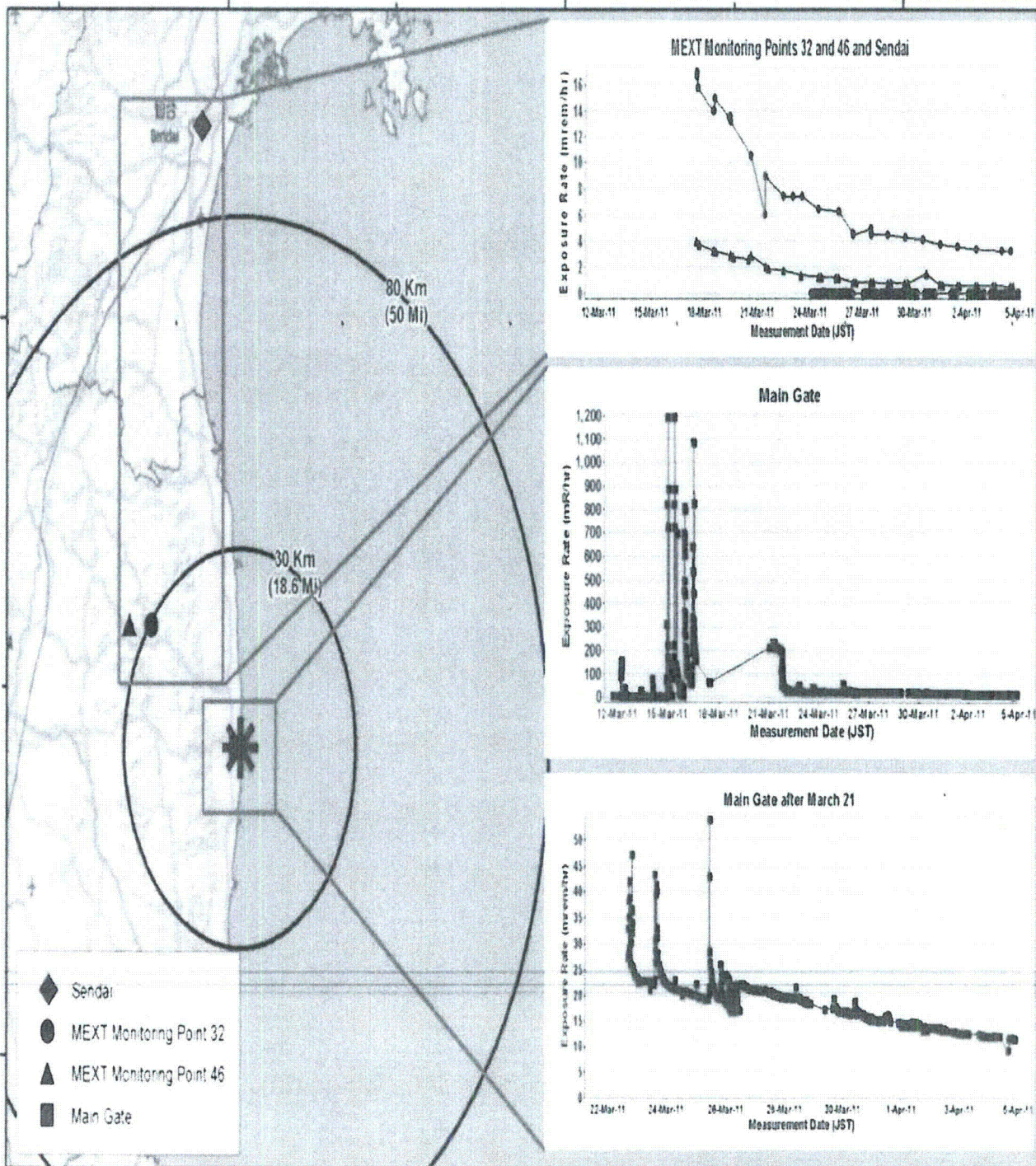
Nuclear Incident Team DOE NIT
Contact (202) 586-8160



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Name: NIT 24hrsMonitoringResults_04Apr2011_1300

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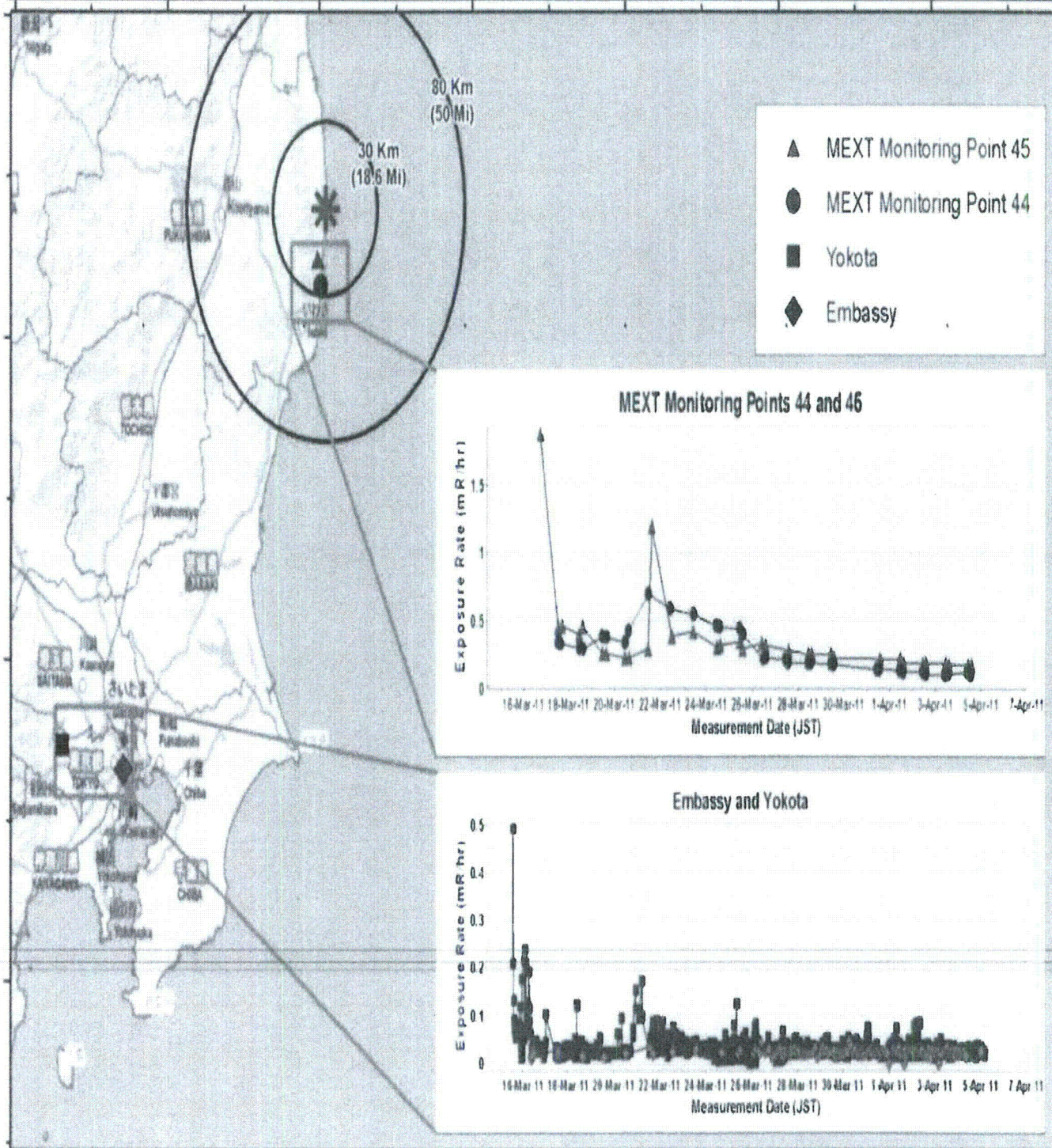
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Name: NIT MonTrend 04Apr2011 xPAGs North

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Exposure Rate Trends Extending South to Yokota AB

FUKUSHIMA DAIICHI
JAPAN

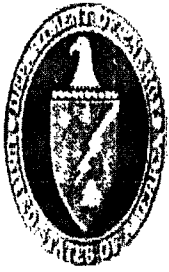


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Name: NIT MonTrend 04Apr2011 w/PAGs South

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Aerial and Ground Monitoring Data Assessment

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

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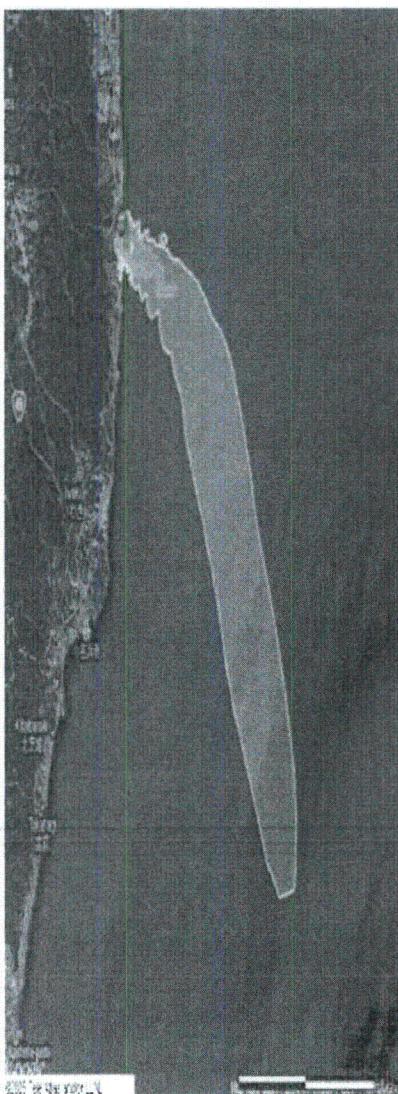
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Forecasted Weather April 5-6, 2011

04/05/2011 20:00:00 JST



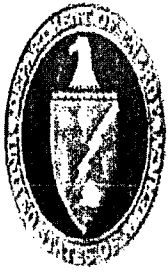
04/06/2011 08:00:00 JST



04/06/2011 18:00:00 JST



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Planned Operations: Next 24 Hrs

♦ Aerial Monitoring

- AMS UH-1: Fly from Fukushima Daiichi plant south to 30 km line along coast
- AMS C-12: Fly west of Fukushima Daiichi plant between 40-60 km
- Flights are being coordinated with GOJ MEXT

All areas inside of 80 km from plant will be surveyed in period 6-12 April

AMS will fly inside 60 km line; MEXT will fly outside 60 km line

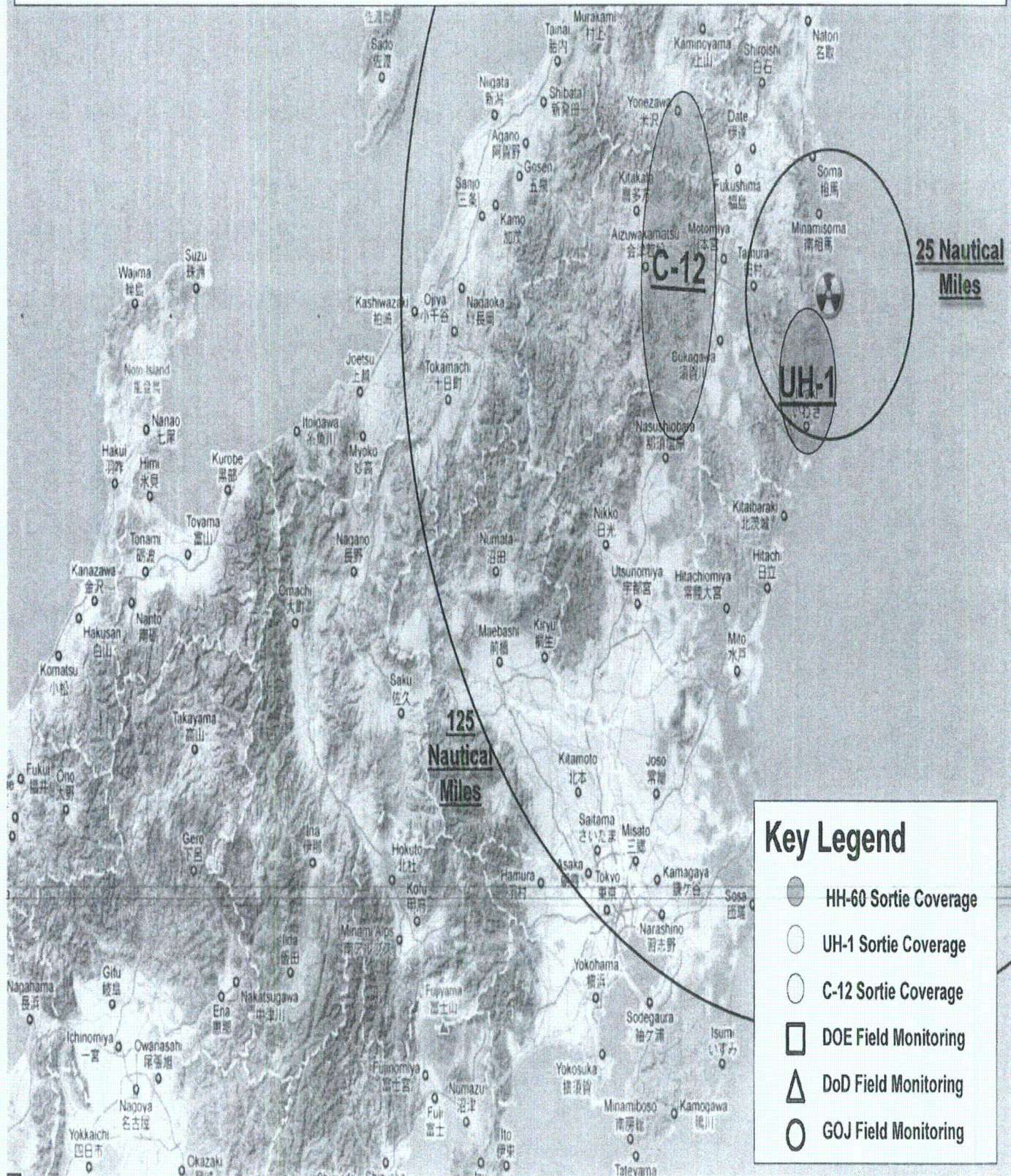
♦ Ground Monitoring

- Complete beta/gamma exposure rate surveys. Radio nuclide evaluations are to include in-situ measurement assessment of gamma isotopes.
- Continue monitoring activities at the US Embassy Japan and the Embassy Resident Towers in Tokyo, CMOC TOC at Yokota AB, and Yokuska Naval Base.
- Continuing work to implement the Early Warning Array utilizing Infields and SMC.

- Ambassador Roos visiting Yokota and will meet with CMRT

Planned Aerial/Field Monitoring Operations

April 6, 2011 Operational Period

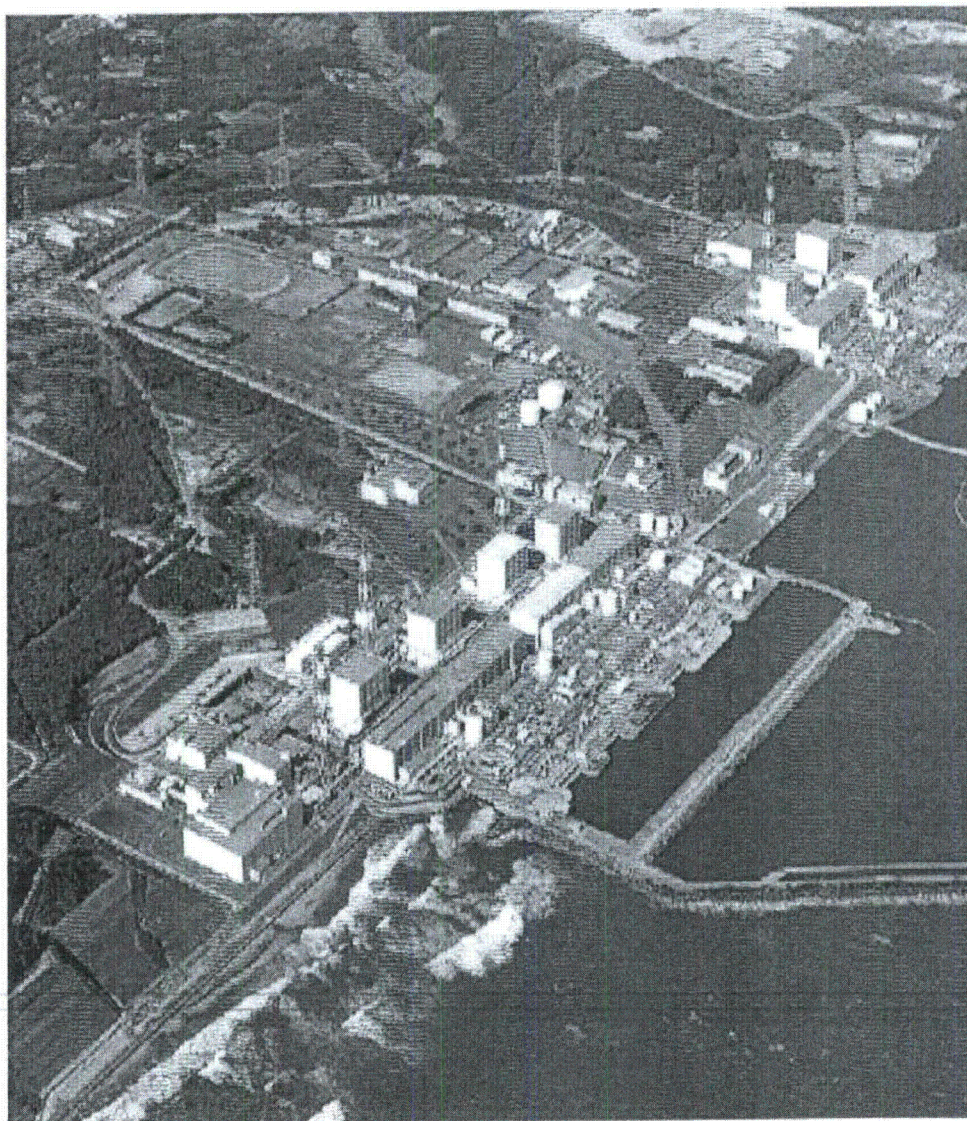




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Japan Earthquake Response

April 4, 2011 // 1800 EDT



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your agency or organization without
prior clearance from U.S. DOE**

**Contact: DOE/NNSA Nuclear Incident
Team: NITOPS@nnsa.doe.gov**

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Current Status

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

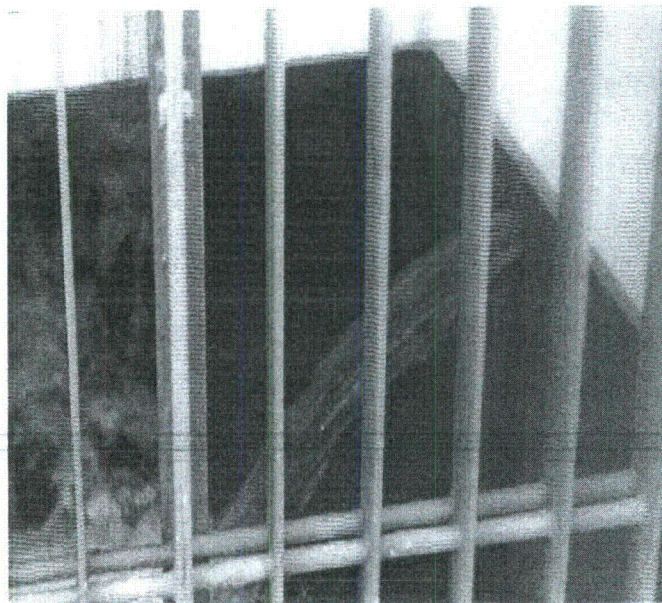
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Current Status (continued)

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



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DOE/NNSA Emergency Response

♦ Command, Control, Coordination:

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

♦ Modeling

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

♦ Monitoring and Sampling

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

♦ Assessment

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

♦ Medical Consultation

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

Deployed* (39)

Yokota AB

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

US Embassy Tokyo

- (4) DART LNO

USPACOM HQ

- (1) LNO

Upcoming personnel changes:

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

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

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Significant Events: Past 24 Hrs.

International Engagement:

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

Nuclear Incident Team:

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

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Significant Events: Past 24 Hrs.

Operations:

♦ Modeling

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

♦ Field Monitoring and Assessment

- AMS UH-1 (1): Flew along eastern flanks of mountains on west side of Tohuka Expressway north to Koriyama to north side of Fukushima
- AMS UH-1 (2): Surveyed coast south of Mito
- AMS C-12: Flew in valley west of Fukushima Daiichi NPP, from south near Shirasaka to mountains on west side, north to Shiroy, and east to ocean. *Did not fly in afternoon due to high winds.*
- AMS HH-60: Reassigned by USAF
- Ground teams: Continued surveys of military installations in Tokyo area in support of aerial mapping. Teams conducted beta/gamma surveys and HPGe in-situ gamma spectrum measurements

♦ Medical Consult

- Nothing substantial to report

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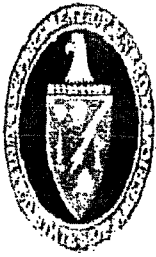
Mission Summary

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

* Duplicate data removed from aggregate total

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

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Data Providers

♦ Japan

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

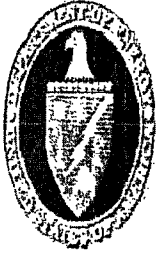
♦ Consequence Management Response Team

- CMRT/CMOC
- AMS
- AFRAT

♦ External US

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

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Guide to Interpretation

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

■ Early Phase DRL

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

■ First Year DRL

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

■ Fifty Year DRL

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

Second Year DRL

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

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

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

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Guide to Interpretation

Areas at Risk for Agricultural Contamination

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

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

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

◆ Areas 10 to 100 times historical background are indicated by green.

◆ Areas 2 to 10 times historical background are indicated by light blue.

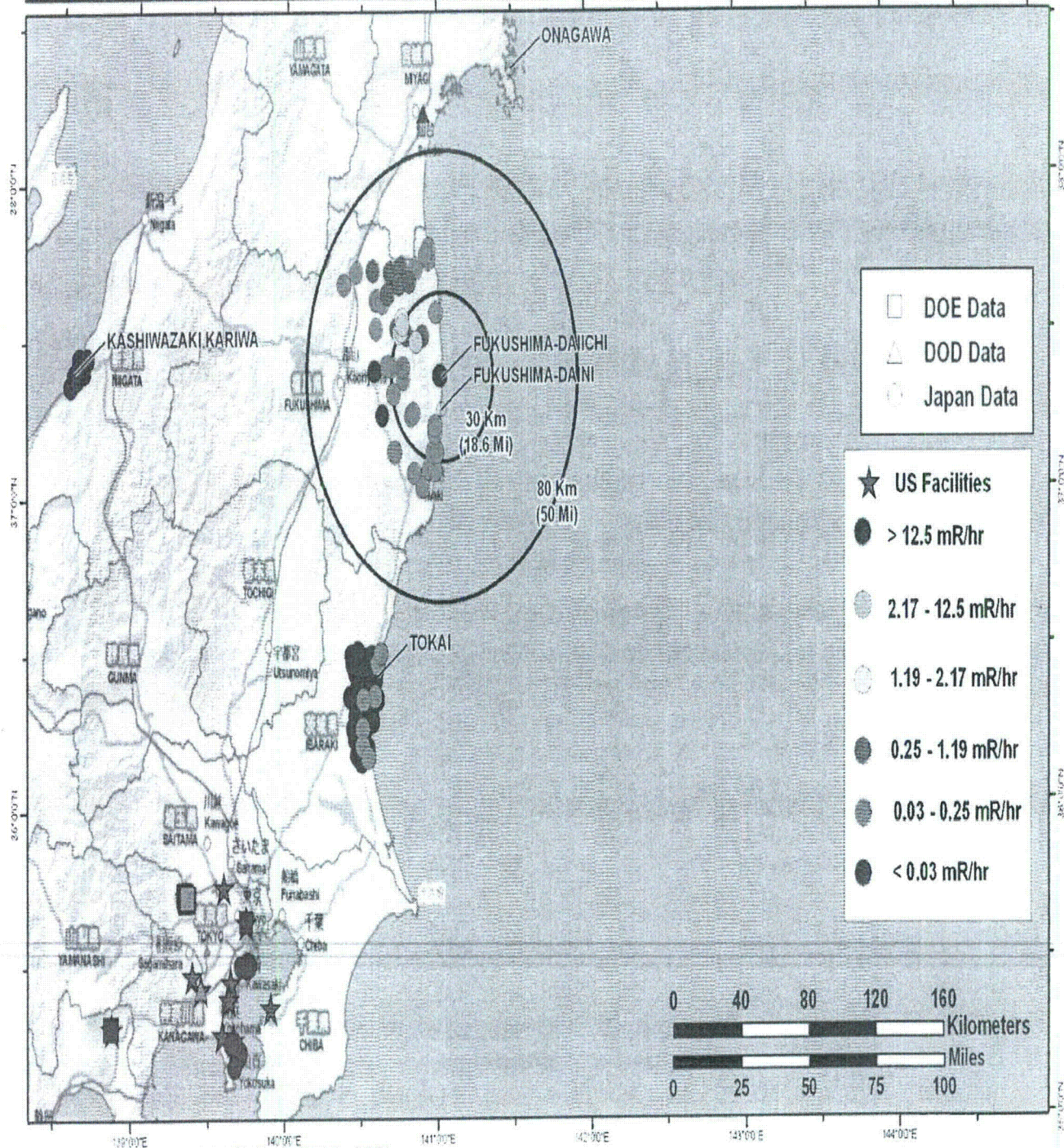
◆ Areas at or near historical background are indicated by dark blue.

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Field Monitoring Results April 4 01:00 to April 5 01:00 JST

FUKUSHIMA DAIICHI
JAPAN



Map created on 04052011 0200 JST

Name: NIT 24hrsMonitoringResults 04Apr2011 0100

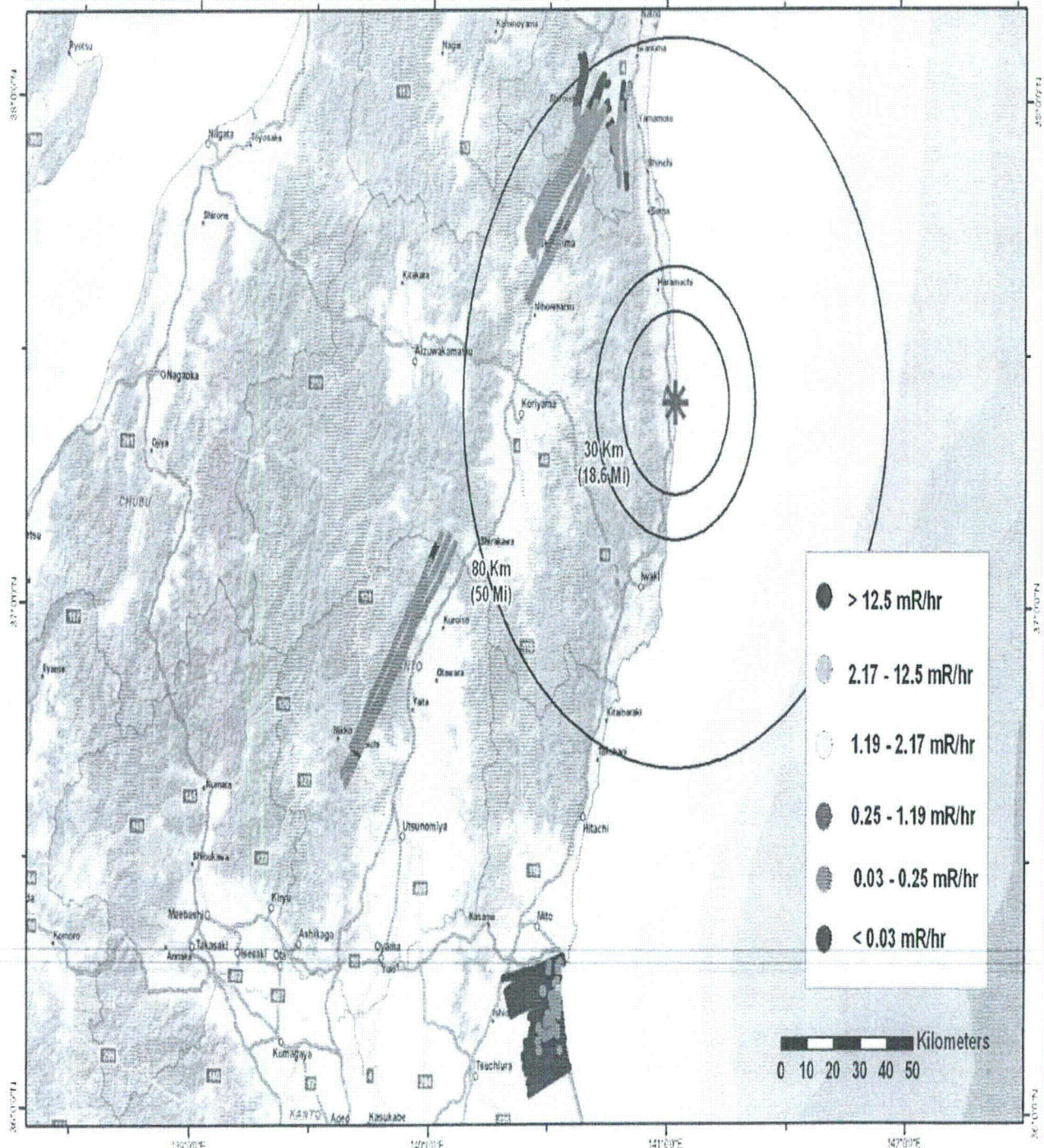
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Nuclear Incident Team DOE NIT
Contact (202) 586 - 8100



Aerial Monitoring Results Combined Flights (April 04, 2011)

FUKUSHIMA DAIICHI
JAPAN



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

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Aerial and Ground Monitoring Data Assessment

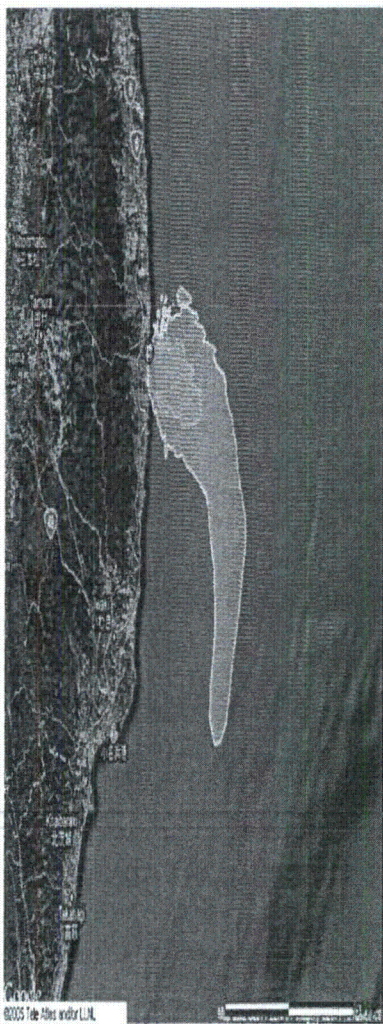
- ♦ An assessment of measurements gathered through 4 April continues to show:
 - Radiation levels consistently below actionable levels for evacuation or relocation outside of 25 miles
 - Radiological material has not deposited in significant quantities since 19 March
- ♦ An assessment of measurements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



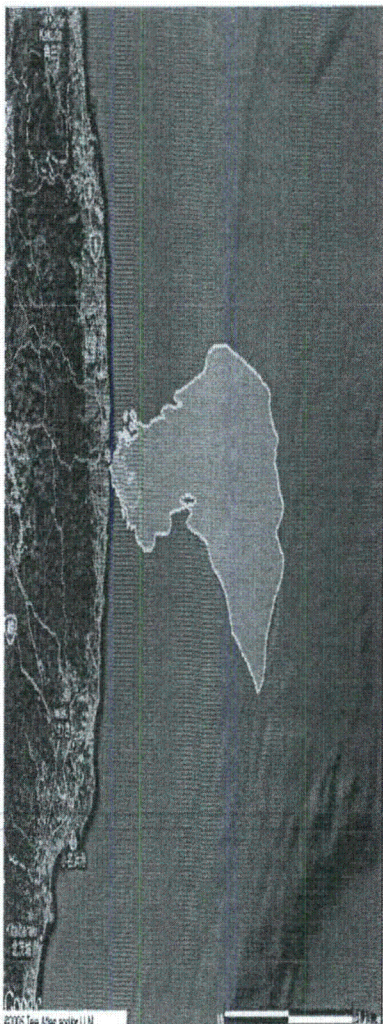
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Forecasted Weather April 5-6, 2011

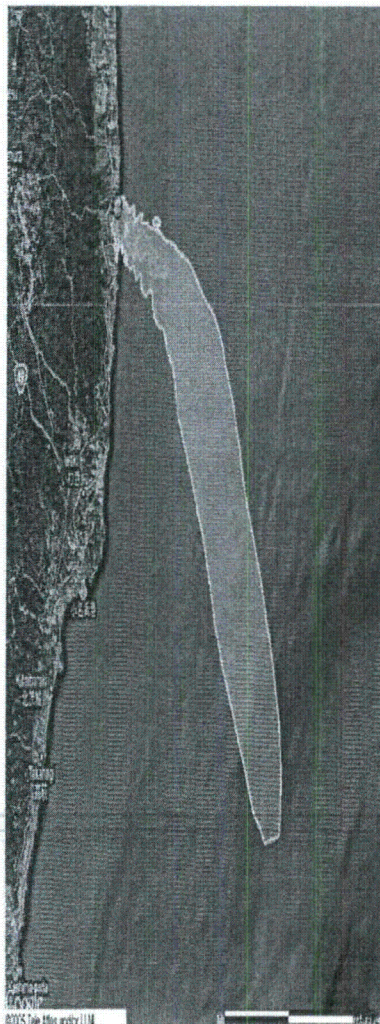
04/05/2011 08:00:00 JST



04/05/2011 20:00:00 JST



04/06/2011 08:00:00 JST



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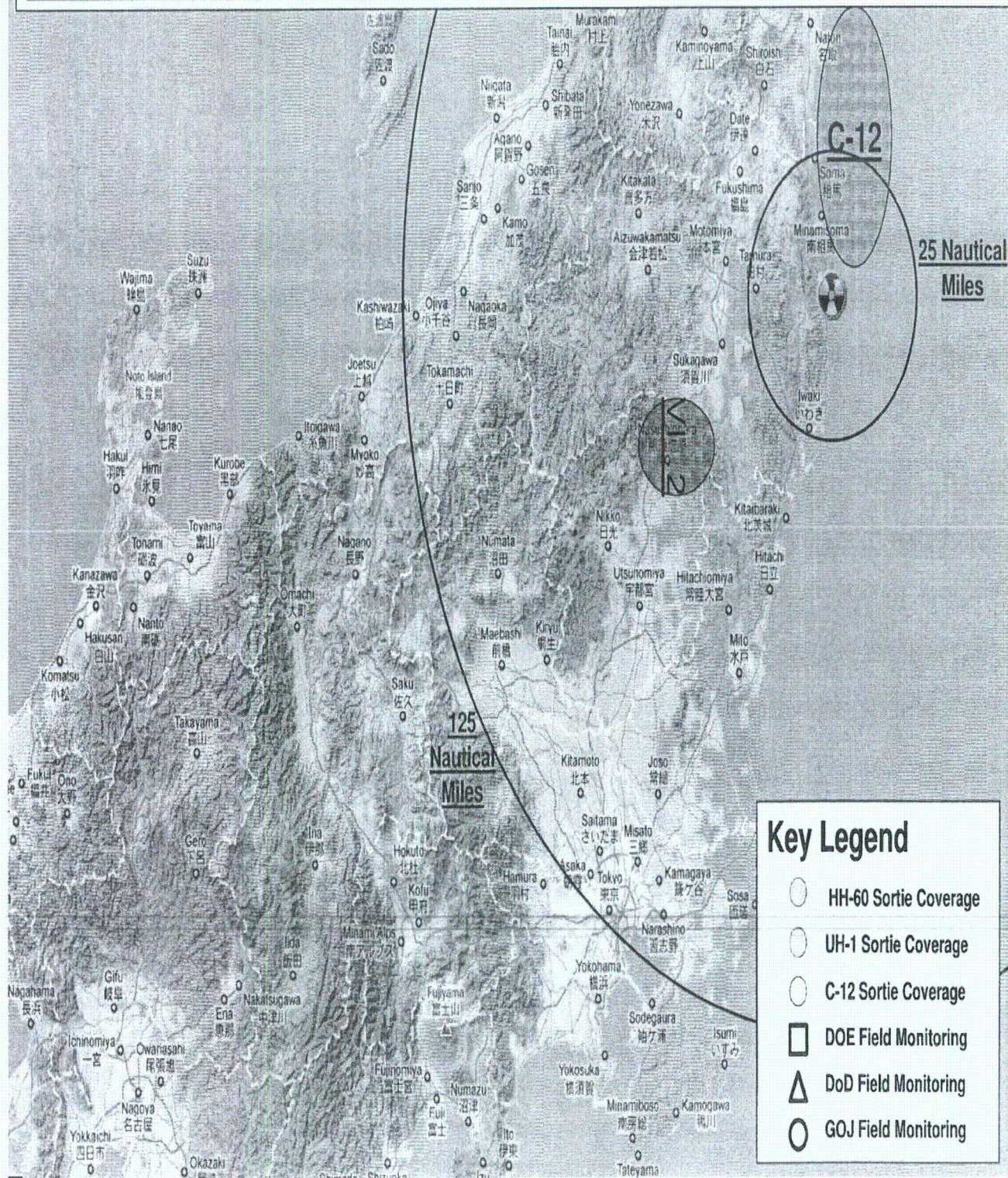
Planned Operations: Next 24 Hrs

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

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



NNSA
National Nuclear Security Administration

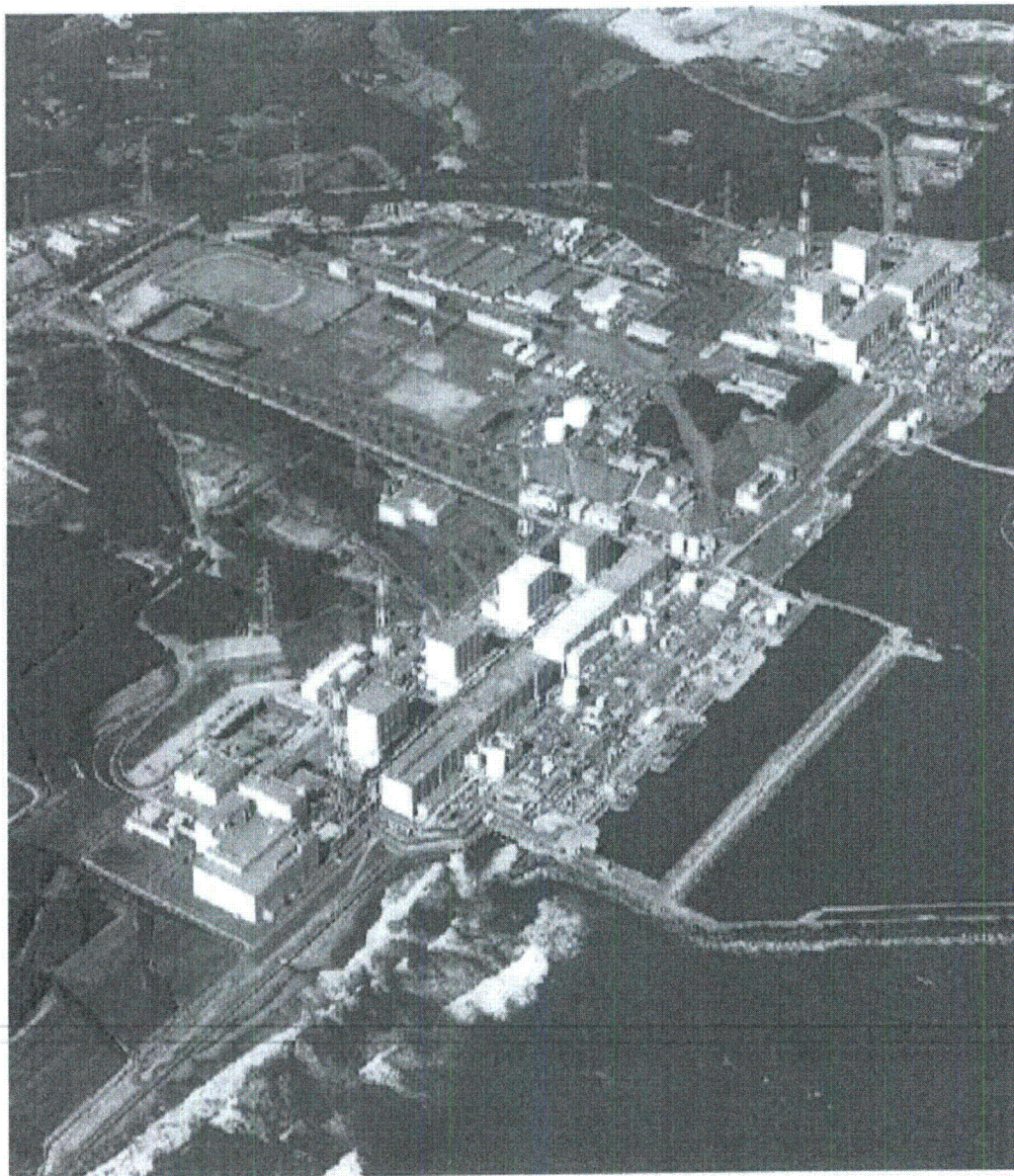




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Japan Earthquake Response

April 4, 2011 // 0600 EDT



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Team: NITOPS@nnsa.doe.gov**

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Current Status (continued)

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



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DOE/NNSA Emergency Response

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- **Policy Working Group (PWG):** Coordinating overall policy
- **Senior Energy Official:** Primary Manager of deployed field teams
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♦ Modeling

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

♦ Monitoring and Sampling

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- Currently 3 platforms: 1 Fixed, 2 Rotary

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- **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.

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Significant Events: Past 24 Hrs.

International Engagement:

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 - 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

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Significant Events: Past 24 Hrs.

Operations:

♦ Modeling

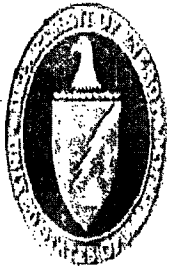
- NARAC: Continued work on products normalizing NARAC models to measurements taken in the field. Preliminary assessment of time correlated deposition and further assessment of dose rate measurements correlated to actual weather patterns

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- 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

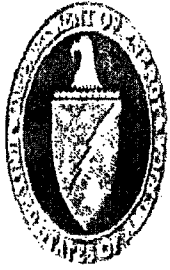
- Ministry of Foreign Affairs (MOFA)
- Nuclear Safety Technology Center (NUSTEC)
- Tokyo Electric Power Company (TEPCO)
- Ministry of Agriculture, Forestry and Fisheries (MAFF)
- Ministry of Education, Culture, Sports, Science, and Technology (MEXT)
- Ministry of Health, Welfare and Labor
- Nuclear and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

♦ Consequence Management Response Team

- CMRT/CMOC
- AMS
- AFRAT

♦ External US

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- USAF, BSC Commander
- USAF, WC-135 Constant Phoenix
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- Nuclear Regulatory Commission
- Naval Reactors



Guide to Interpretation

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

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First Year DRL

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Fifty Year DRL

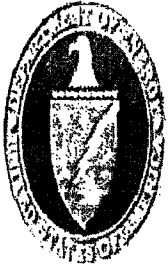
If a person is in danger of receiving an external radiation dose greater than 5 Rem over 50 years, the EPA recommends relocation until radiation levels decrease. This is not an urgent action because the dose is received over fifty years. This area falls within the second year DRL.

Second Year DRL

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

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

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



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Guide to Interpretation

Areas at Risk for Agricultural Contamination

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

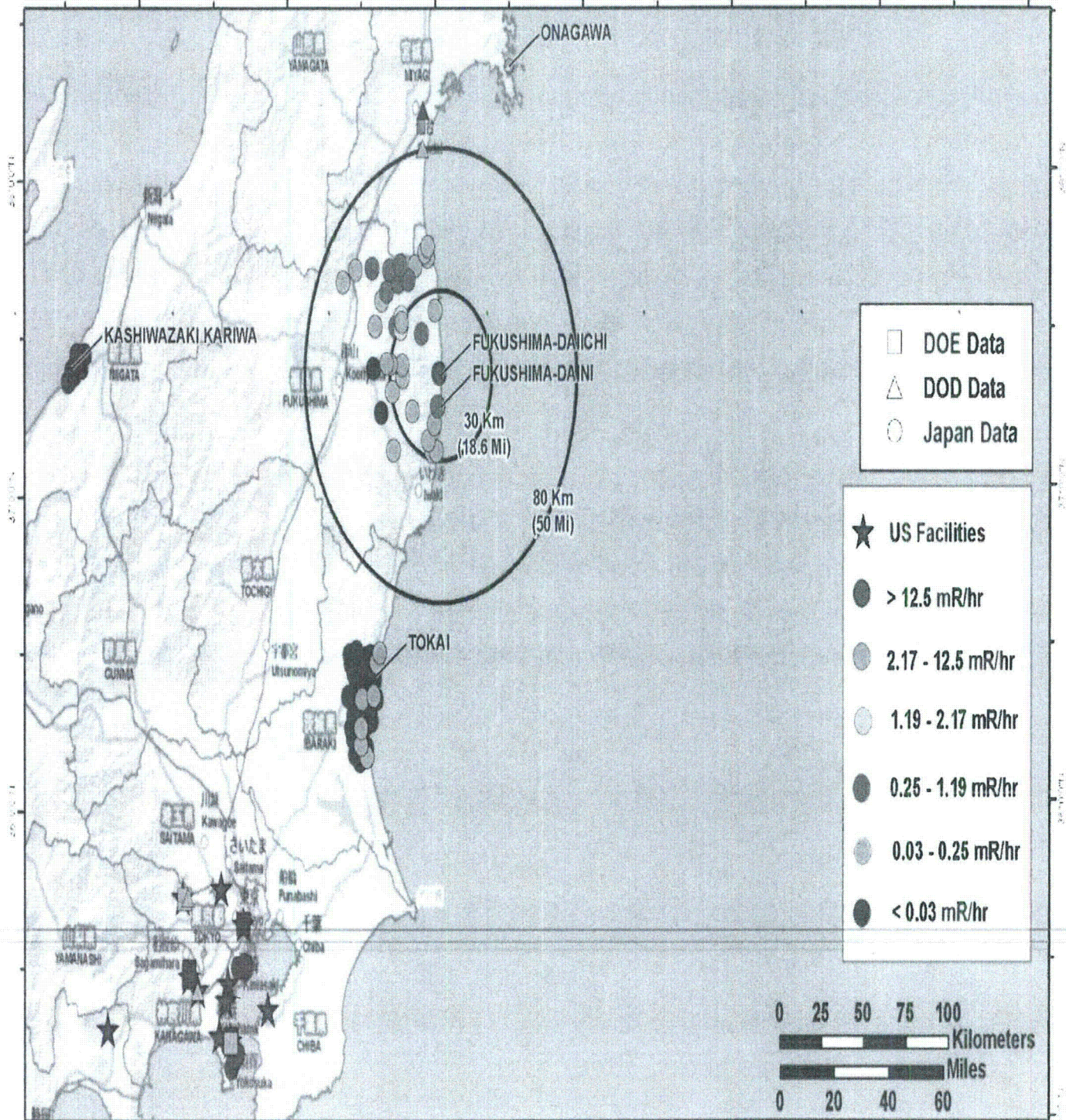
AMS monitoring results in areas beyond 25 miles from the Fukushima Daiichi reactors show areas where dose rates are many times higher than historical background.

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

◆ Areas 10 to 100 times historical background are indicated by green.

◆ Areas 2 to 10 times historical background are indicated by light blue.

◆ Areas at or near historical background are indicated by dark blue.



Map created on 04042011 1430 JST

Name: NIT 24hrsMonitoringResults 03Apr2011 1300

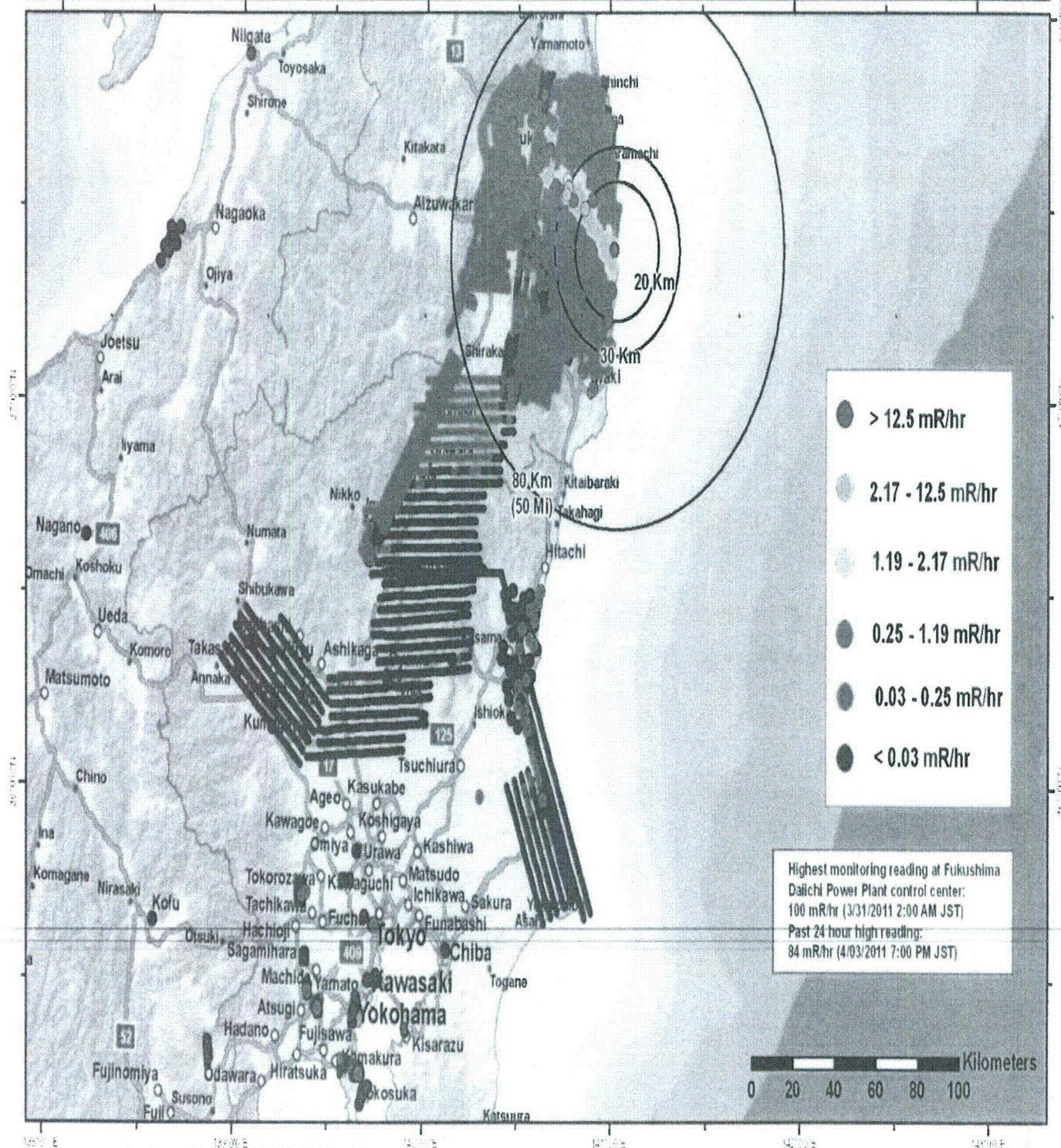
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Nuclear Incident Team DOE NIT
Contact (202) 586 - 8100



Ground Based and Aerial Monitoring Results FUKUSHIMA DAIICHI JAPAN

Data from (March 30 - April 03)



Map created on 04032011 2340 JST

Name: NIT Combined Flights Ground Measurements 30Mar_03Apr2011 Results

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Nuclear Incident Team DOE NIT
Contact (202) 586 - 8100



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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 $\mu\text{R/hr}$ - a level that poses no known health risk
 - Monitoring of these locations will continue although no increases in deposited radiation are anticipated

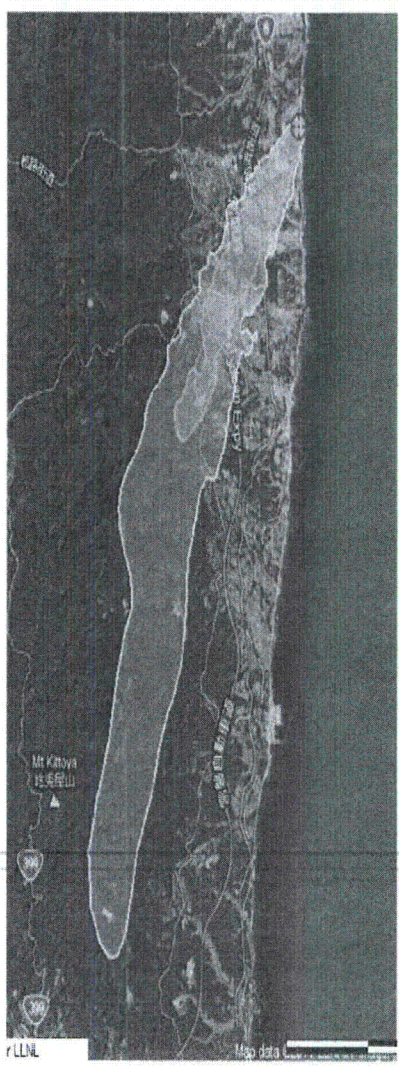
~~Official Use Only~~



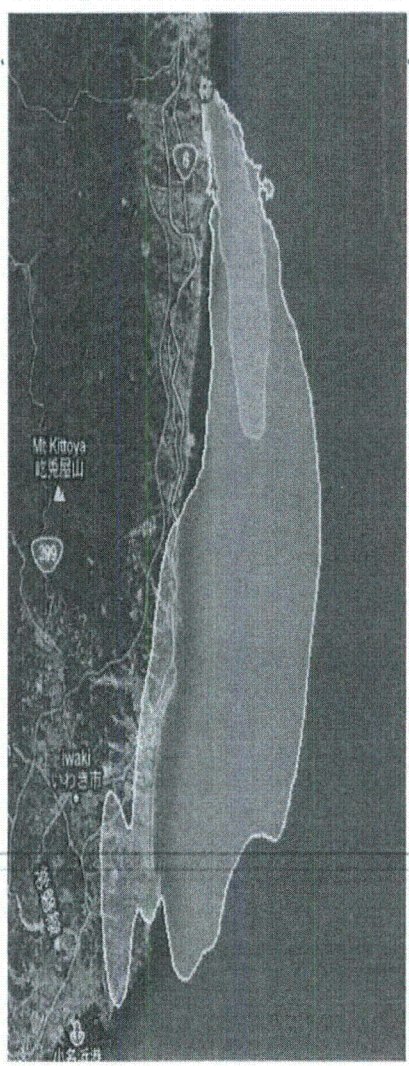
Official Use Only

Forecasted Weather April 4-5, 2011

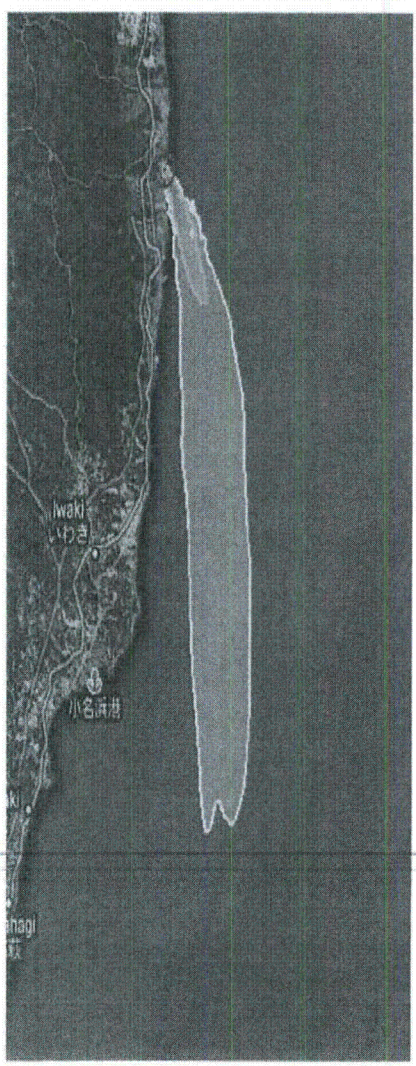
04/04/2011 19:00:00 JST



04/04/2011 22:00:00 JST



04/05/2011 06:00:00 JST



Official Use Only



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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.

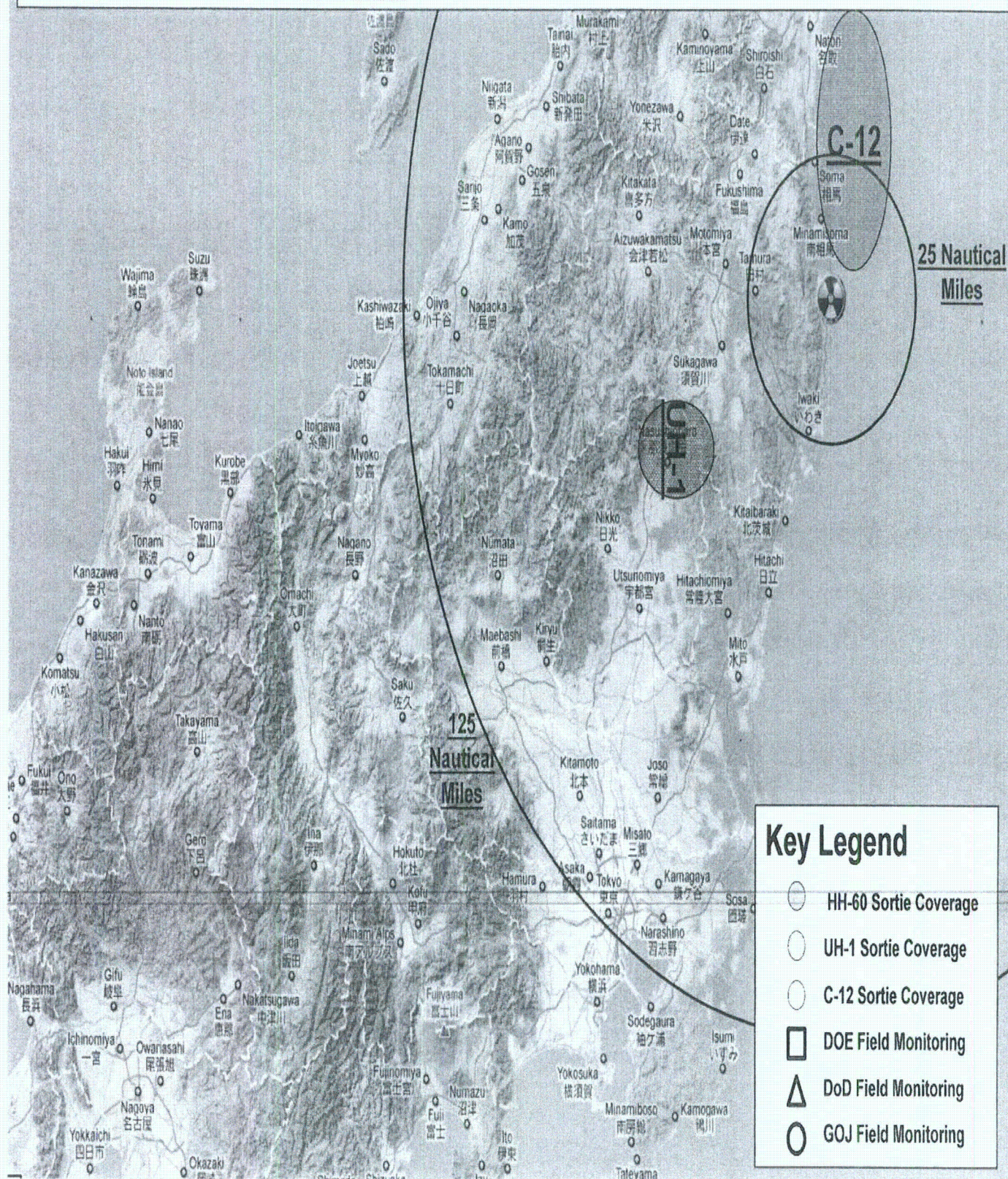
~~Official Use Only~~

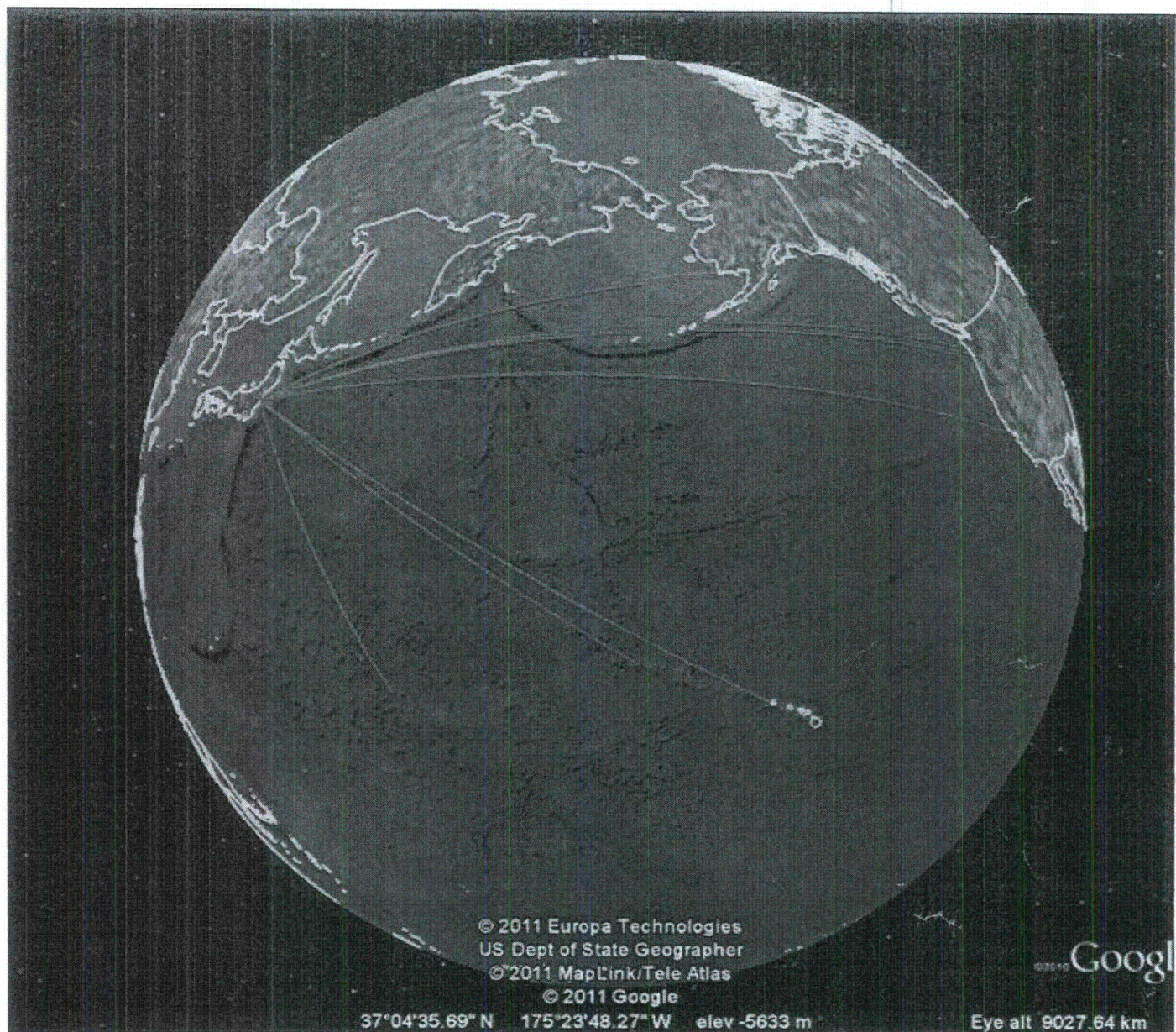
Planned Aerial/Field Monitoring Operations

April 5, 2011 Operational Period



NISA
National Nuclear Security Administration





Fukushima to:

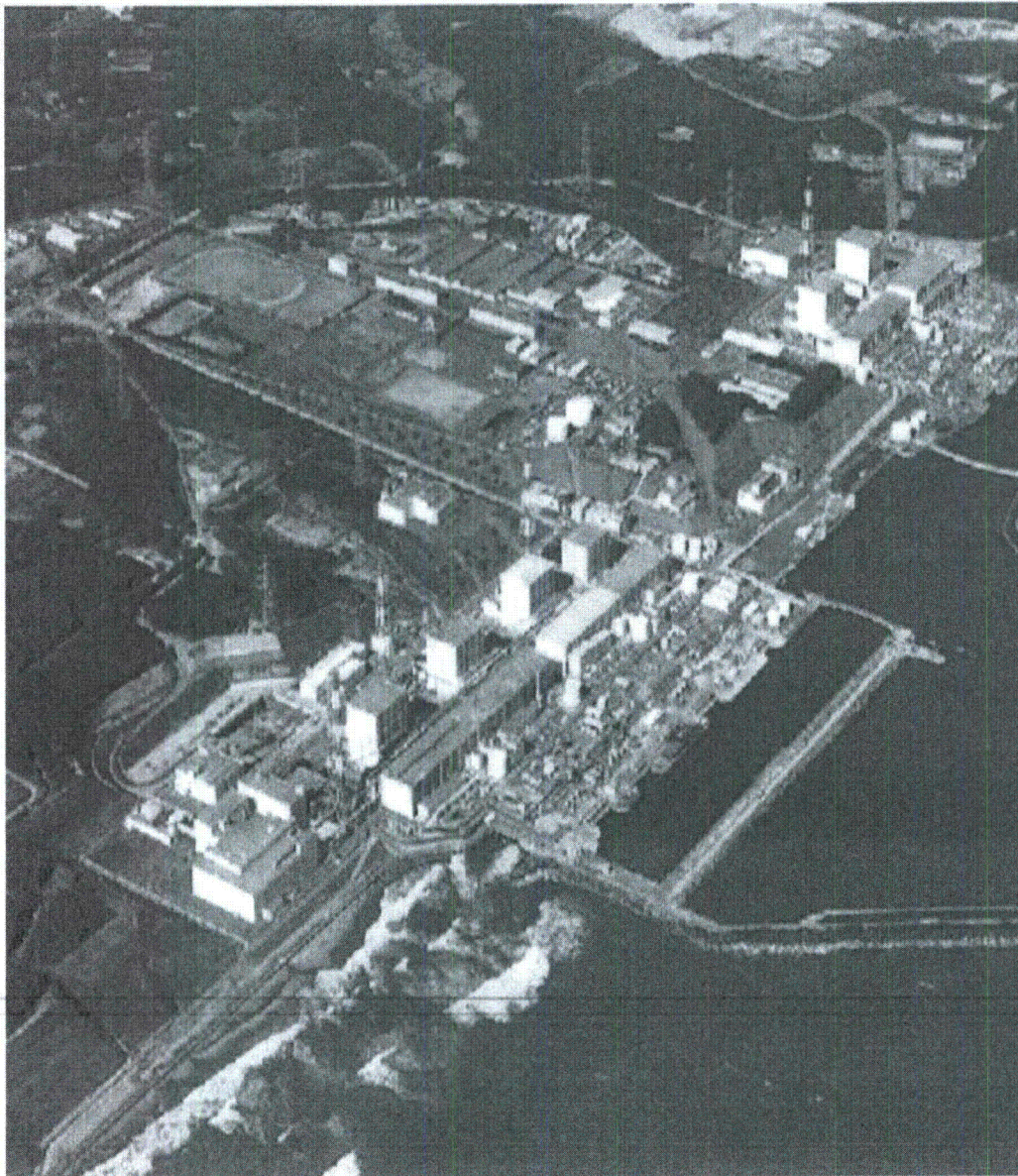
Alaska	5,048 km / 3,136 mi
California (SF)	8,072 km / 5,015 mi
Oregon (Portland)	7,585 km / 4,713 mi
Washington (Aberdeen)	7,427 km / 4,615 mi
Hawaii	6,385 km / 3,967 mi
Wake Island	3,193 km / 1,984 mi
Midway Islands	4,612 km / 2,866 mi



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Japan Earthquake Response

April 1, 2011 // 0600 EDT



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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.**



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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.

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~~Official Use Only~~

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 Koriyama to the hills north of Kuroiso to complete planned mission from 3/30.
 - AMS HH-60: Flew the southern half Tohoku Expressway north of Koriyama 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.

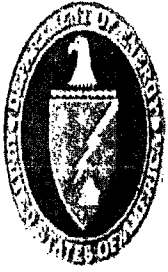
One ground team traveled to Yokuska to collect the air sample.

- 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

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Guide to Interpretation

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

■ Early Phase DRL

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

First Year DRL

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

Fifty Year DRL

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

Second Year DRL

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

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

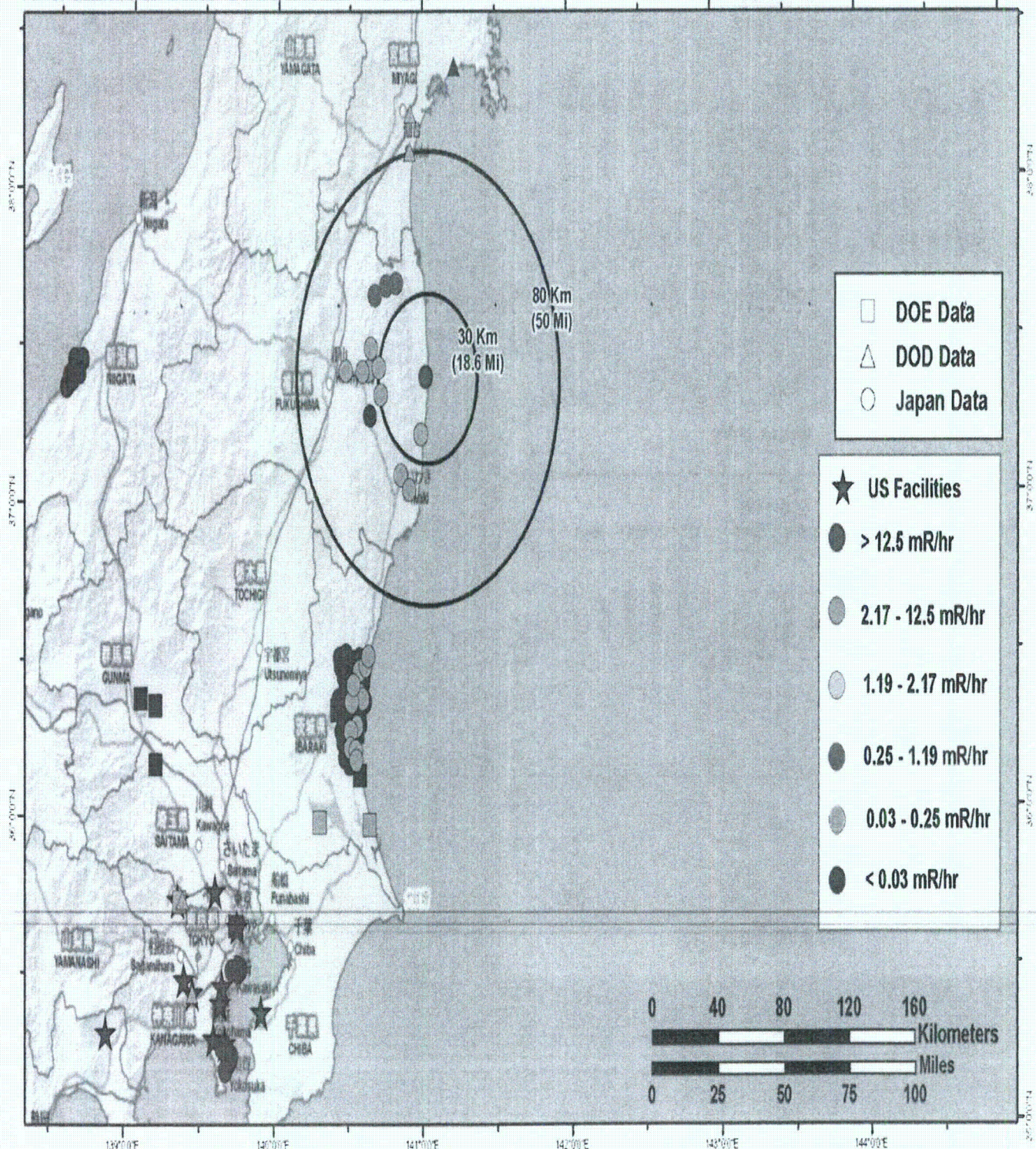
Protective actions are frequently expressed in dose rates. The dose rate is an indicator that residents would accumulate the threshold dose if they stayed in the area the entire time expressed (e.g. 1 year, 2 years, 50 years)

~~Official Use Only~~



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

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Nuclear Incident Team DOE NIT
Contact (202) 586 - 8100



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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



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Planned Operations: Next 24 Hrs

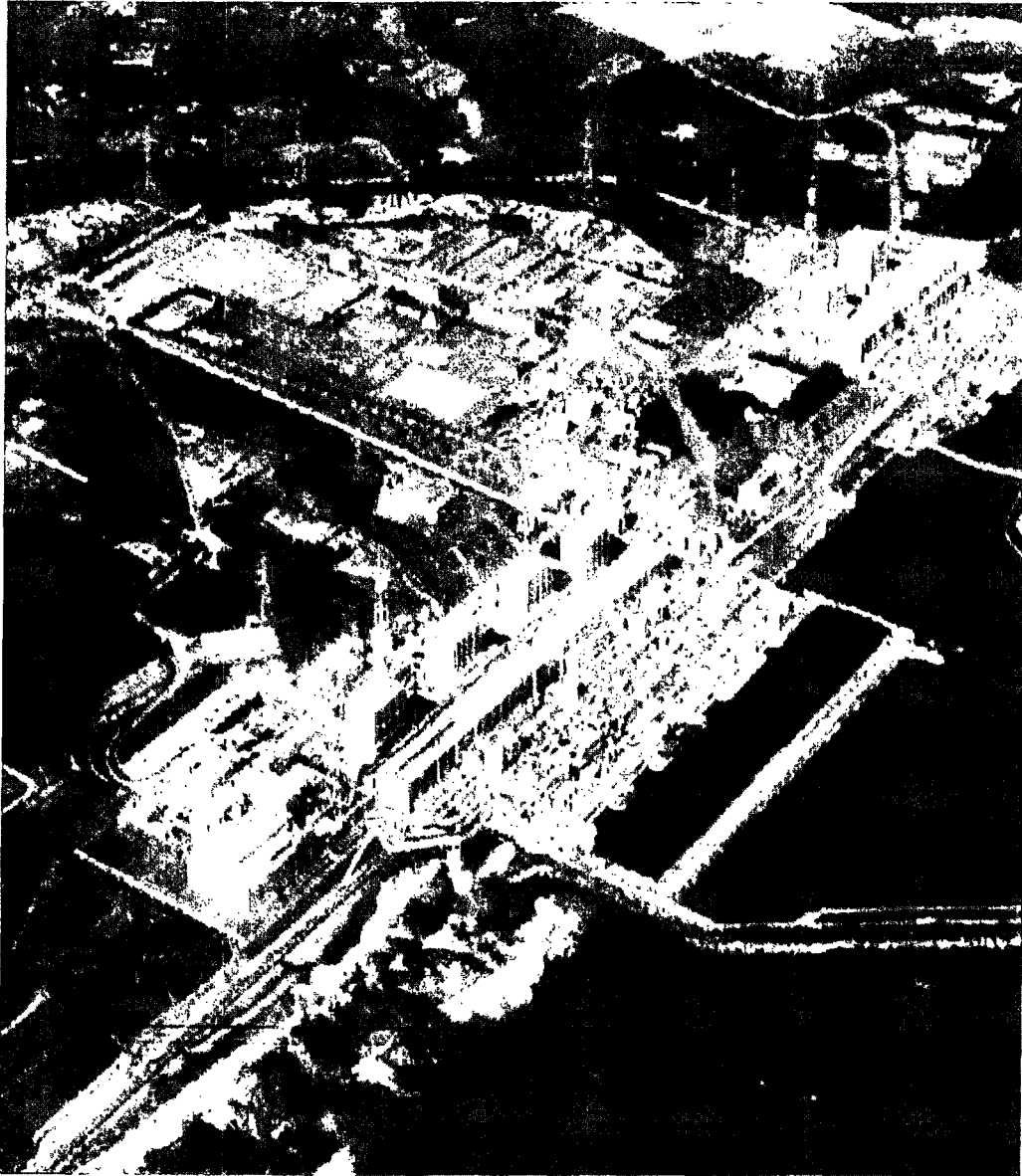
- ♦ Aerial Monitoring
 - AMS UH-1: Fly approximately 50-65 NM west of the plant at 500 ft AGI at 2000 ft line spacing.
 - AMS HH-60: Fly approximately 55-70 NM west/southwest of the plant at 500 ft AGI at 2000 ft line spacing.
 - AMS C-12: Fly approximately 20-40 NM west of the plant.
- ♦ Ground Monitoring
 - 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).

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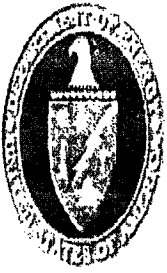


~~Official Use Only~~

Japan Earthquake Response March 31, 2011 // 0600 EDT



~~Official Use Only~~

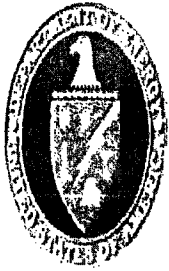


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**Contact: DOE/NNSA Nuclear Incident
Team: NITOPS@nnsa.doe.gov**

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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: The IAEA confirmed that the reactor temperature has decreased slightly. Reactor water level stable, core damage est. 70%. Freshwater injection continues. Electrical power line connected (through Unit 2). Condenser is full, so pumping turbine basement halted at 2230 UTC on 28 Mar.
 - Unit 2: Reactor water level stable, core damage est. 33%. Spent fuel pool has been filled. 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.
 - 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 pond. Power restored. Trucks pumping water into spent fuel pools; seawater is also being injected via the Fuel Pool Cooling System (FPC).
- ♦ **TEPCO continues to address issues with water in the trenches outside the turbine buildings of Units 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.**



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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 (45)

Yokota AB

- (1) SEO
- (1) SEO Staff
- (23) CMRT
- (7) AMS

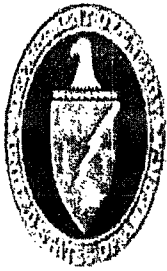
US Embassy Tokyo

- (2) Foreign Service Nationals
- (2) Permanent Staff
- (3) DART LNO
- (1) Nuclear Energy Representative

USPACOM HQ

- (1) LNO

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—Official Use Only—

Significant Events: Past 24 Hrs.

Operations:

♦ Modeling

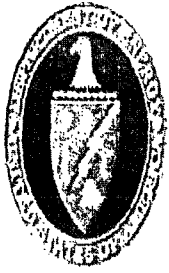
- NARAC: Developed Intermediate Phase PAGs for two hypothetical release scenarios; continued work on products normalizing NARAC models to measurements taken in the field.

♦ Field Monitoring and Assessment

- Continued monitoring activities at the US Embassy Japan
- Continued to coordinate with USFJ and GOJ to implement the Distance Early Warning Line
- Two ground teams drove in the Mito area and the valley northwest of Tokyo in the Takasaki/Maebashi region at the request of GOJ and conducted beta/gamma surveys, HPGe in-situ gamma spectrum and low-volume air sample for particulate/iodine

♦ Medical Consult

- REAC/TS provided information regarding population monitoring considerations and screening strategies to share with GOJ if requested.
- Tasked to participate in the Health Group meeting
- REAC/TS provided advice on passenger screening on a CDC teleconference
- Responded to RFI on bioassay for U.S. workers deployed to Japan



—Official Use Only—

Data Providers

♦ Japan

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

♦ Consequence Management Response Team

- CMRT/CMOC
- AMS
- AFRAT

♦ External US

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

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Guide to Interpretation

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

■ Early Phase DRL

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

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Fifty Year DRL

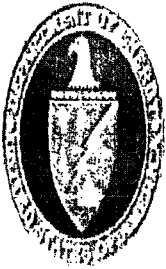
If a person is in danger of receiving an external radiation dose greater than 5 Rem over 50 years, the EPA recommends relocation until radiation levels decrease. This is not an urgent action because the dose is received over fifty years. This area falls within the second year DRL.

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.

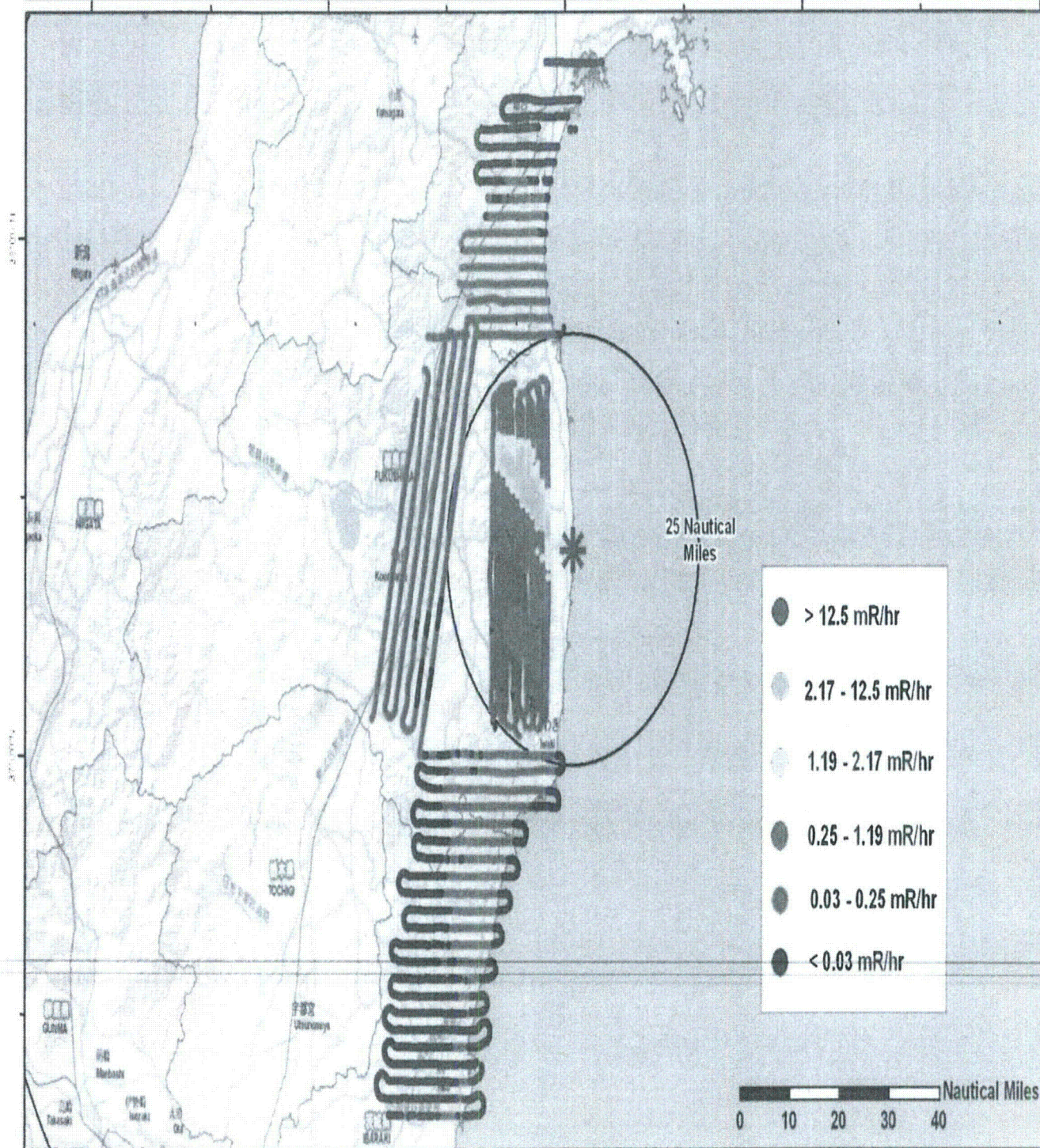
◆ Areas 2 to 10 times historical background are indicated by light blue.

◆ Areas at or near historical background are indicated by dark blue.



Aerial Results C-12 Flights (March 27, 28, 29, 2011)

FUKUSHIMA DAIICHI
JAPAN



Map created on 03302011 0315 JST
Name: NIT 29Mar2011 Combined Flights 0327_0329

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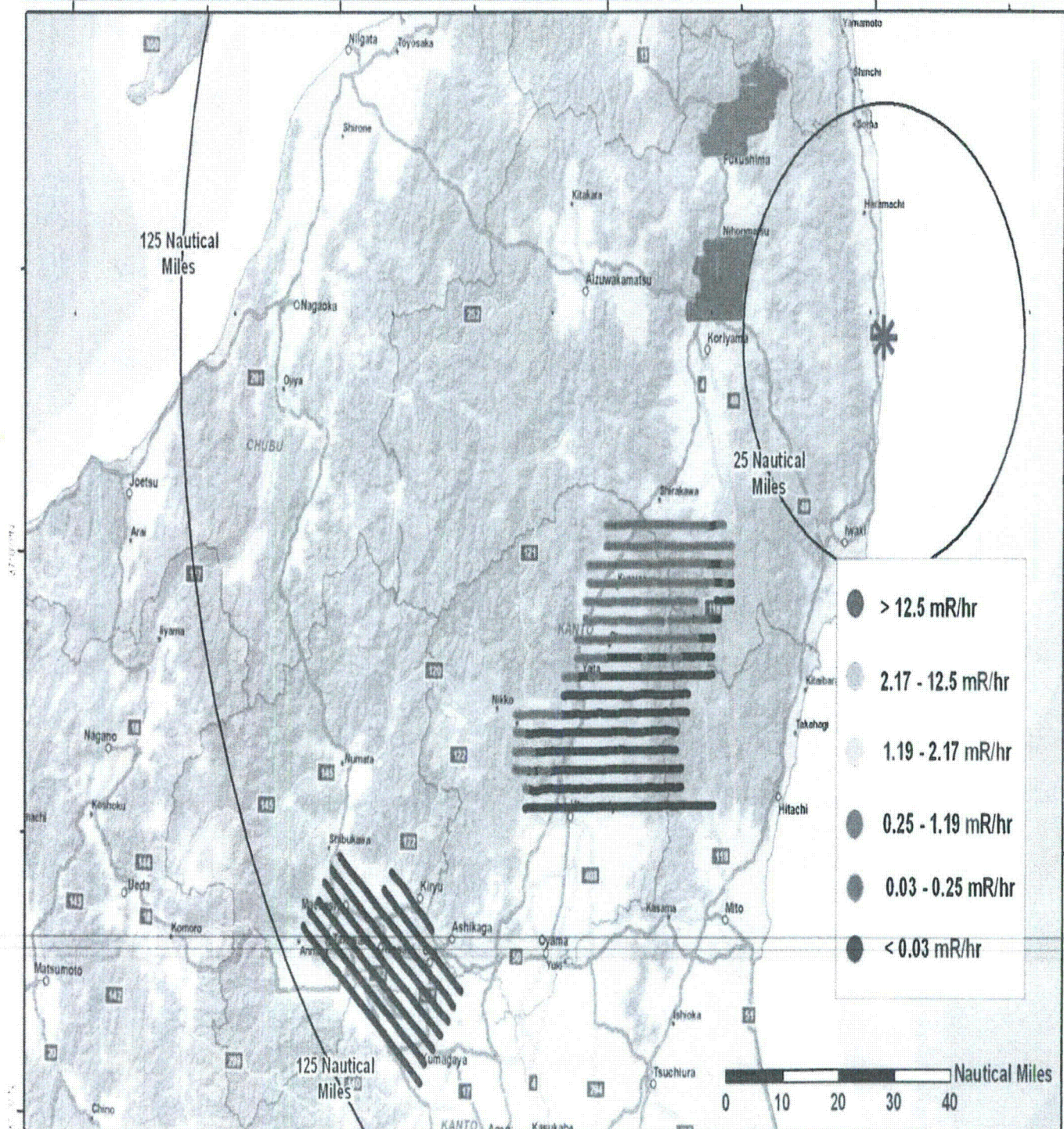
Nuclear Incident Team DOE NIT
Contact (202) 586 - 8100



Aerial Monitoring Results

Combined C-12, UH-1, and UH-60 Flight (March 30, 2011)

FUKUSHIMA DAIICHI
JAPAN



Map created on 03302011 2350 JST
Name: NIT Combined Aerial Results 30Mar2011

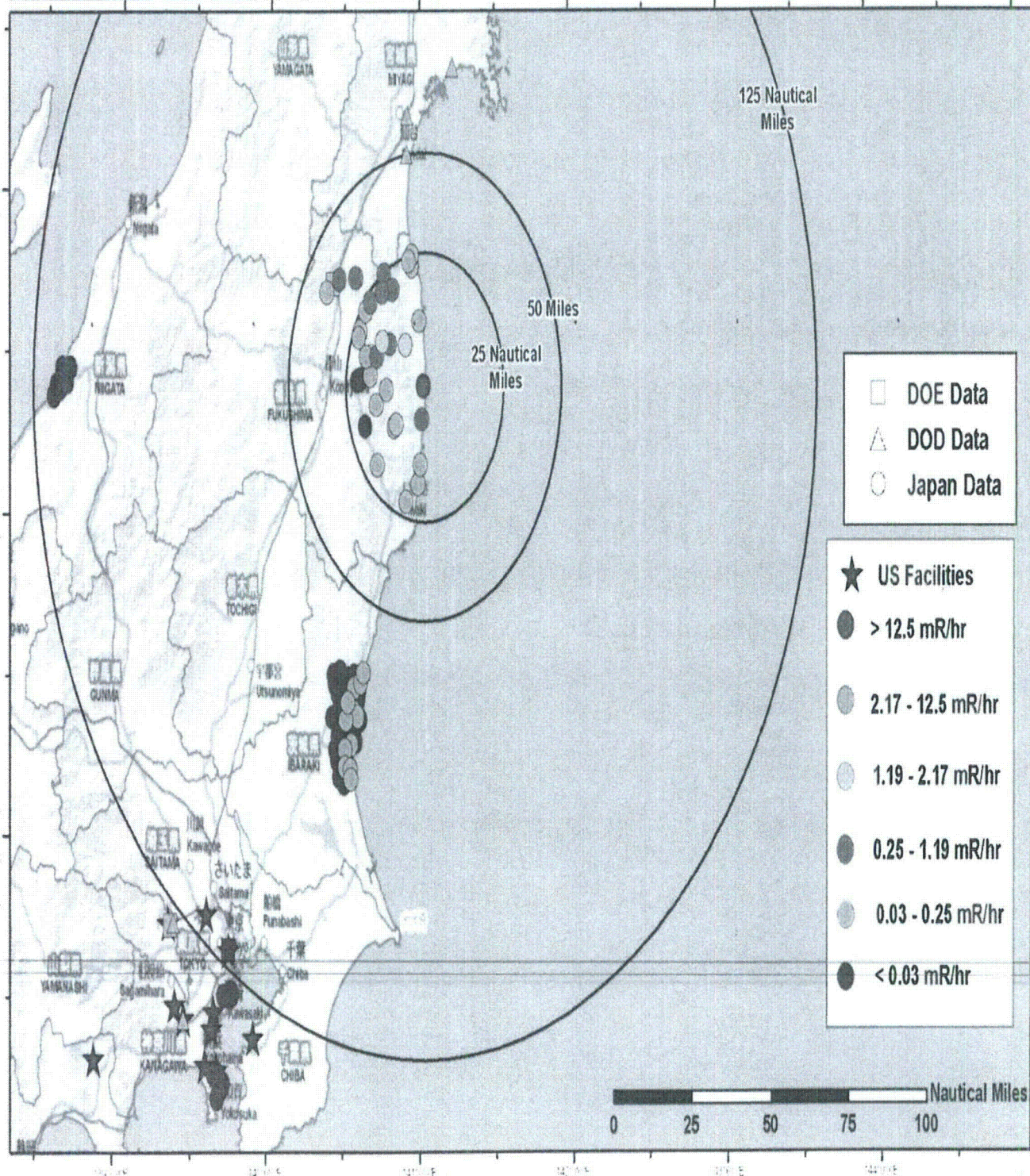
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Nuclear Incident Team DOE NIT
Contact (202) 586 - 8100



Field Monitoring Results March 30 13:00 to March 31 13:00 JST

FUKUSHIMA DAIICHI
JAPAN



Map created on 03312011 1400 JST

Name: NIT 24hrsMonitoringResults 30Mar2011 1300

UNCLASSIFIED

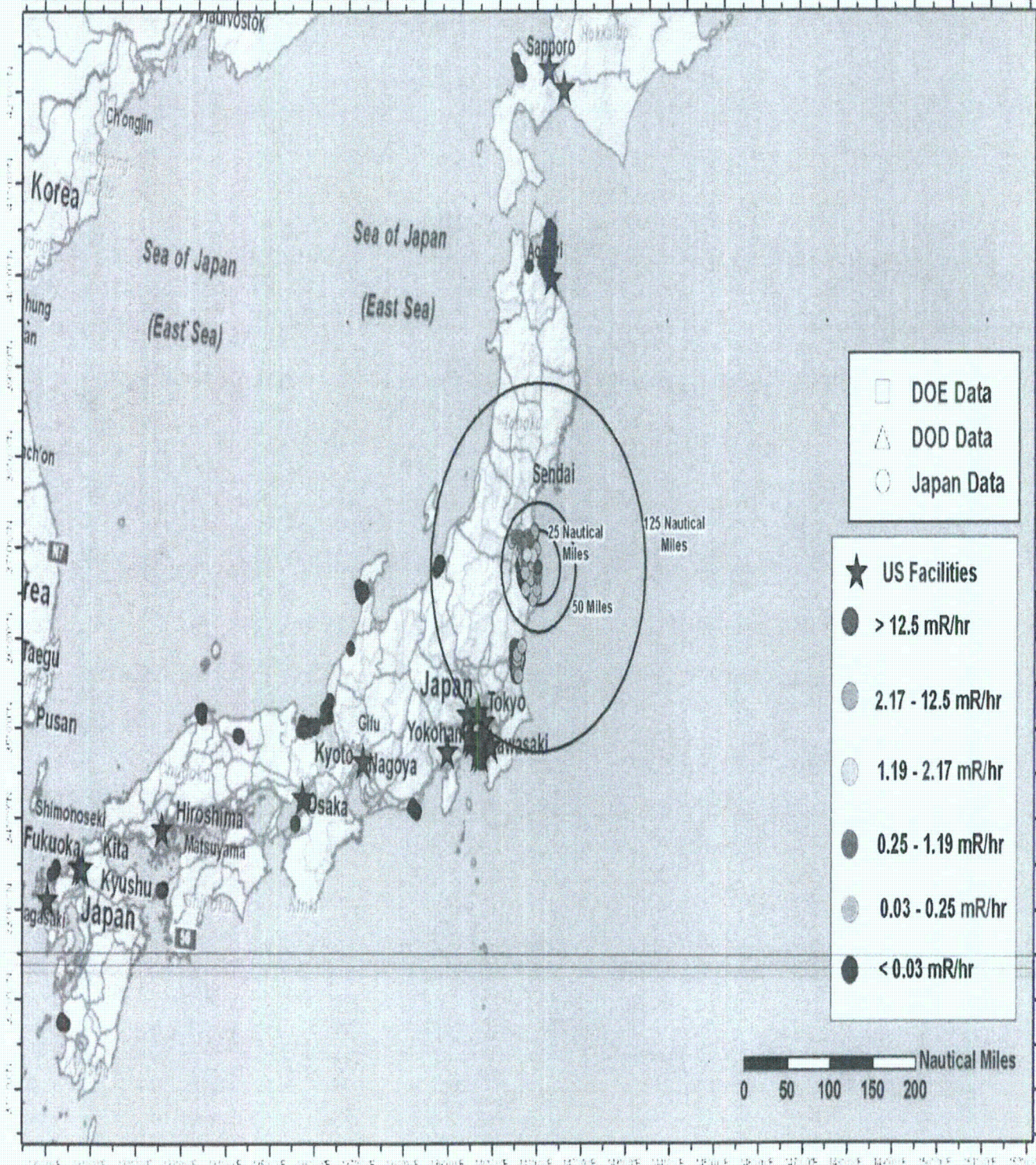
Nuclear Incident Team DOE NIT

Contact (b)(6)



Field Monitoring Results March 30 13:00 to March 31 13:00 JST

FUKUSHIMA DAIICHI
JAPAN



Map created on 03312011 1400 JST

Name: NIT 24hrsMonitoringResults Overview 30Mar2011 1300

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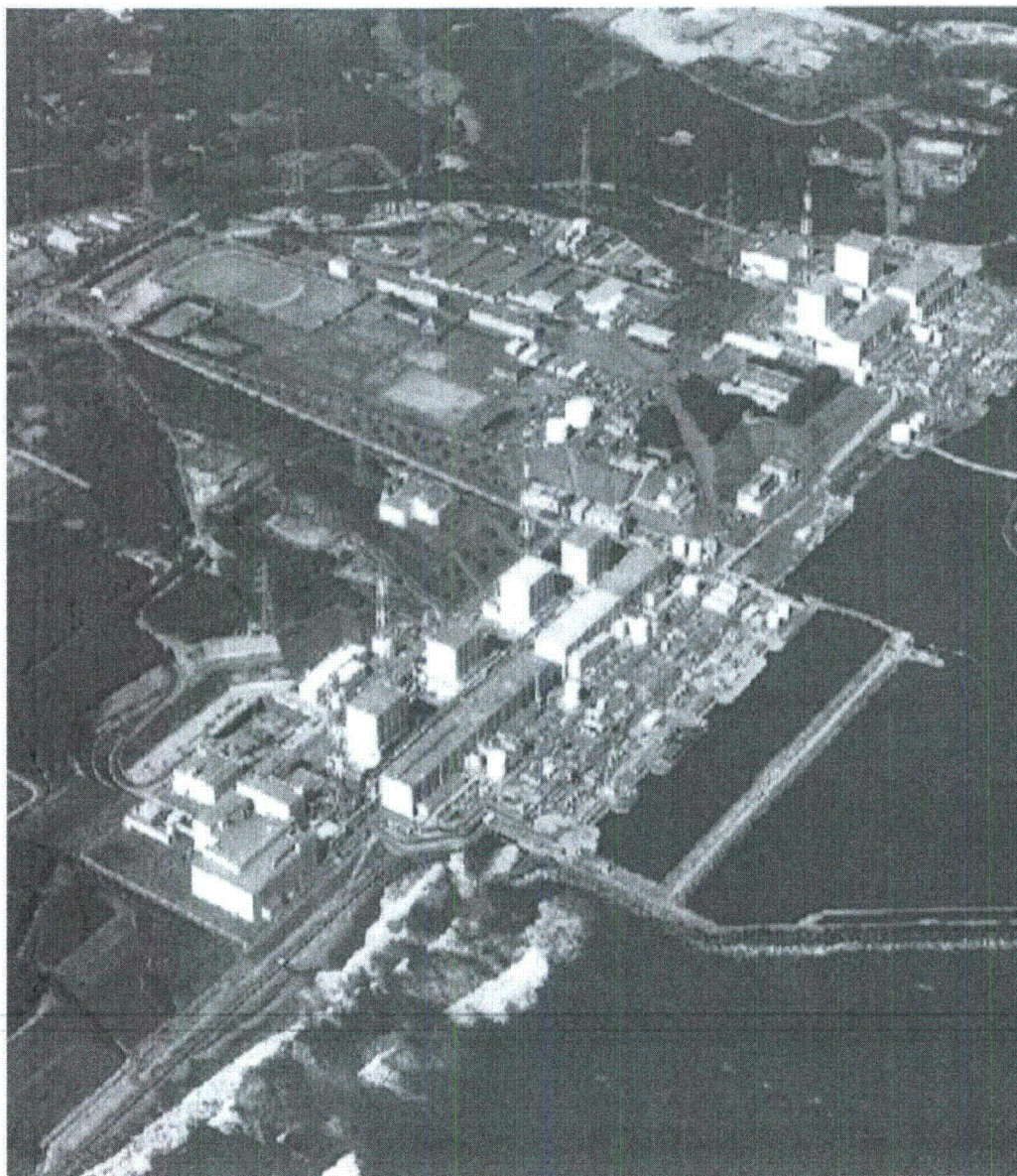
Contact (202) 586 - 8100



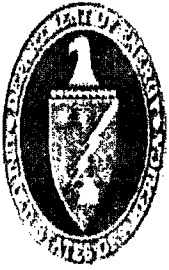
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Japan Earthquake Response

March 28, 2011 // 0600 EDT



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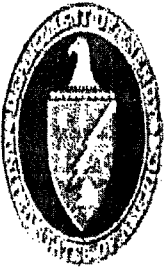


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**Contact: DOE/NNSA Nuclear Incident
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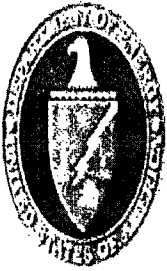
Current Status

No major changes in radiation levels at the Fukushima Daiichi Nuclear Power Plant.

- Unit 1: Reactor water level stable, core damage est. 70%. Freshwater injection continues. Electrical power line connected (through Unit 2).
- Unit 2: Reactor water level stable, core damage est. 33%. Spent fuel pool has been filled. 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.
- 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 pond. Power restored. Trucks pumping water into spent fuel pools; seawater is also being injected via the Fuel Pool Cooling System (FPC).
- Japanese media reports levels of radioiodine reported in tap water in Tokyo decreased to levels considered safe for consumption by infants.

~~Voluntary evacuation zone extended to 30km from Fukushima Daiichi.~~

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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 (45)

Yokota AB

- (1) SEO
- (1) SEO Staff
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US Embassy Tokyo

- (2) Foreign Service Nationals
- (2) Permanent Staff
- (2) DART LNO
- (1) Nuclear Energy Representative

USPACOM HQ

- (1) LNO

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Significant Events: Past 24 Hrs.

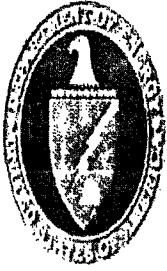
International Engagement:

- Teleconference between GOJ and DOE to discuss Robotics and other specialized equipment
 - GOJ in interested in special pumps to be used in pumping contaminated water
- PNNL requested to support spent fuel transport and disposal
- DOE liaison to DART attended meeting with US NRC and GOJ MEXT, MOFA, and NUSTEC to discuss current situation, planning documents, and monitoring efforts

Nuclear Incident Team

- Coordinated shape files for use by USGS & NGA
- Provided data file spreadsheet to CDC, FDA, HHS, USDA, EPA, NRC, and NR
- Continued development of plan to rotate responders in country

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Significant Events: Past 24 Hrs.

Operations

Modeling

- NARAC: Developed Intermediate Phase PAGs for two hypothetical release scenarios; continued work on products normalizing NARAC models to measurements taken in the field.

Field Monitoring and Assessment

- AMS: The following data is still being analyzed
 - C-12 mission concentrated on areas north of the plant outside of the 25 mile zone flying a parallel line pattern.
 - UH-1 helo mission concentrated on south and southwest of the plant in the hills west of the coast.
 - HH-60 helo mission concentrated on west of the valley in the hills west of today's flights.
- CMRT: Field monitoring teams took measurements in support of AMS flights and at the US Embassy (Tokyo), including low-volume air sampling.
- Developed early warning concept using DOE radiation detectors

Medical Consult

- REAC/TS provided information regarding population monitoring considerations and screening strategies to share with GOJ if requested.
- Tasked to participate in the Health Group meeting

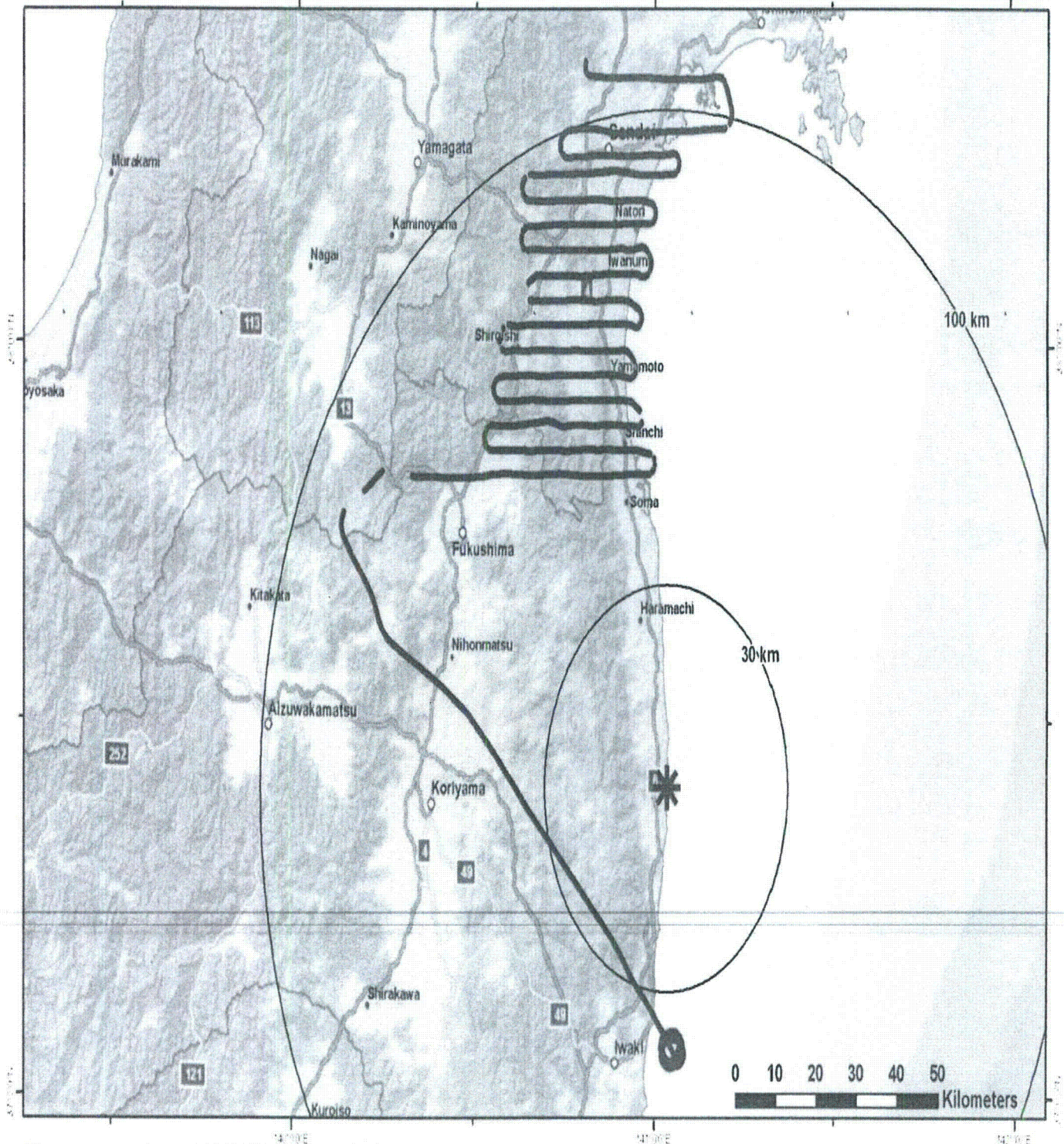
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Aerial Monitoring Path - C12

March 28, 2011

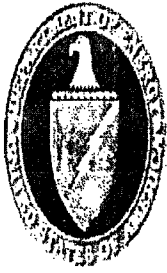
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Map created on 03282011 1630 JST
Name: NIT C-12_28Mar2011 Path

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Contact (202) 586 - 8100



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Data Providers

Japan

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

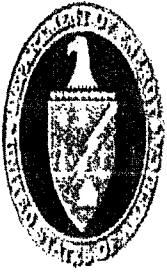
Consequence Management Response Team

- CMRT/CMOC
- AMS
- AFRAT

External US

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

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Guide to Interpretation

Derived Response Levels (DRL)

• Early Phase DRL

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• 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 in 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 in yellow.

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

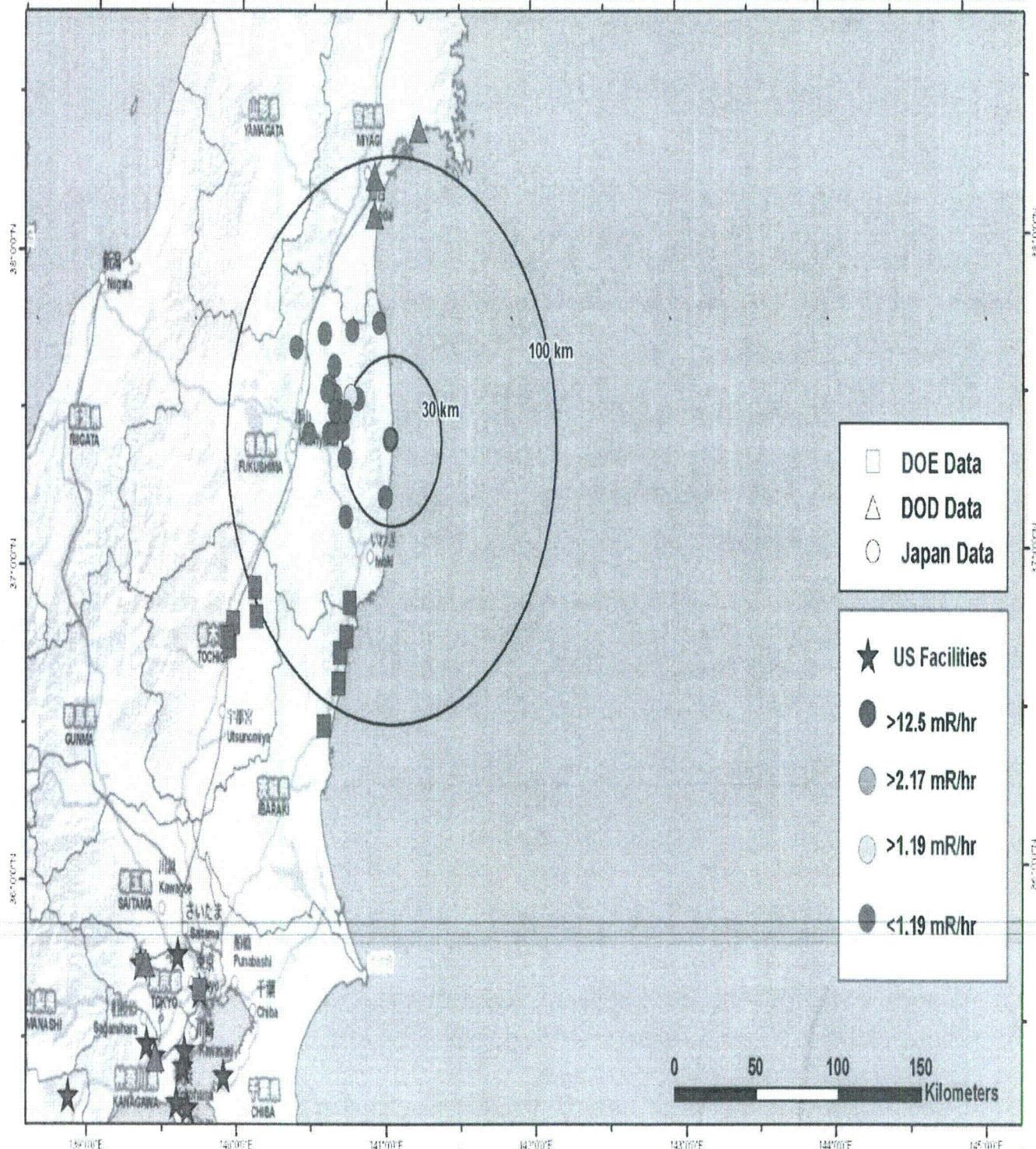
Protective actions are frequently expressed in dose rates. The dose rate is an indicator that residents would accumulate the threshold dose if they stayed in the area the entire time expressed (e.g. 1 year, 2 years, 50 years)

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Field Monitoring Results March 27 13:00 to March 28 13:00 JST

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JAPAN



Map created on 03282011 1400 JST
Name: NIT 24hrsMonitoringResults 27Mar2011v1b

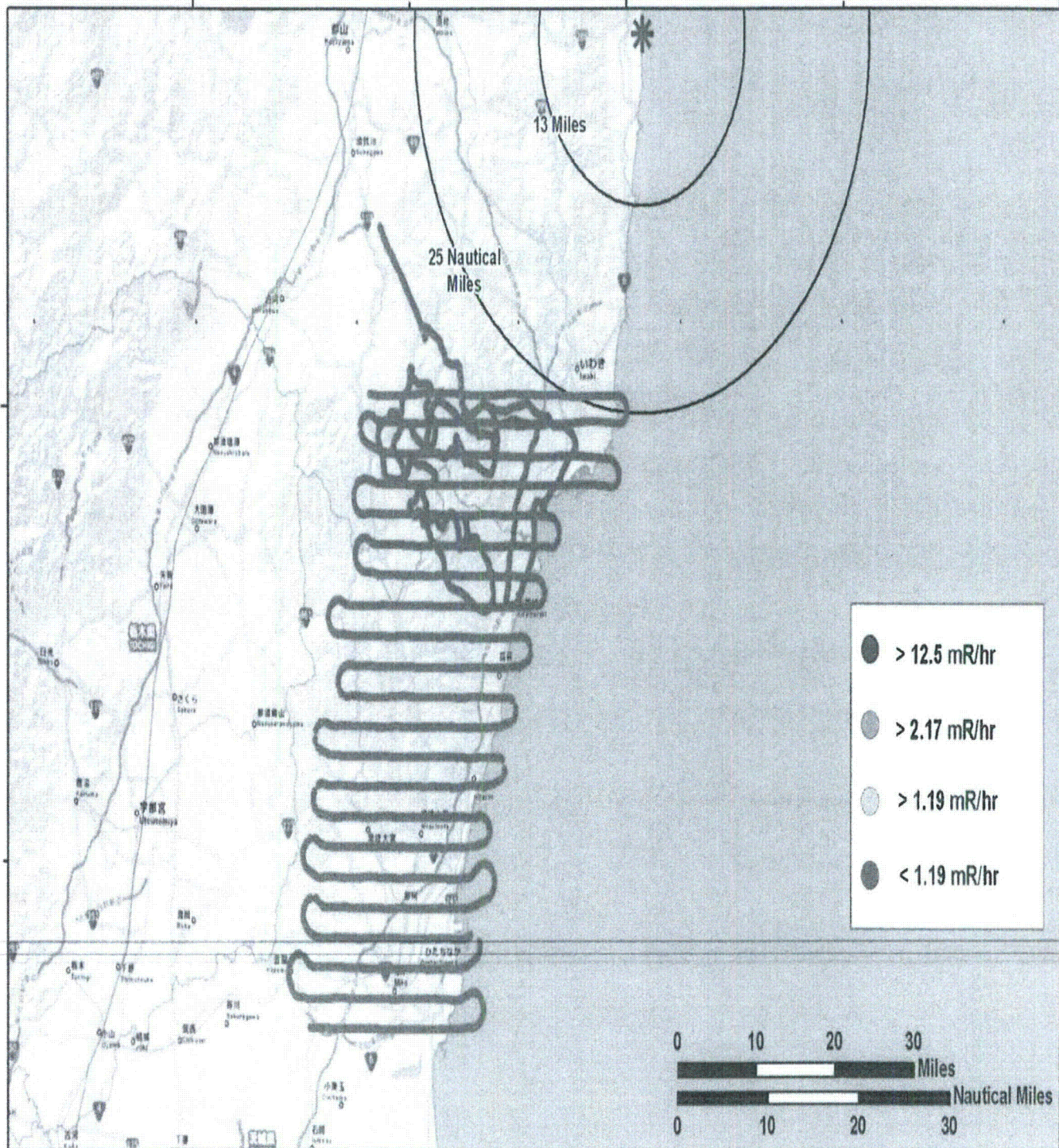
UNCLASSIFIED

Nuclear Incident Team DOE NIT
Contact (202) 586 - 8100



Aerial Monitoring Results Combined UH-1 and C-12 Flights (March 27, 2011)

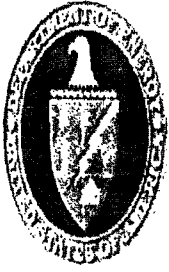
FUKUSHIMA DAIICHI
JAPAN



Map created on 03282011 0115 JST
Name: NIT Combined C12 and UH1 27Mar2011 Results

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Nuclear Incident Team DOE NIT
Contact (202) 586 - 8100



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Assessment

Assessment:

An assessment of measurements gathered through 27 March show:

- Radiation levels consistently below actionable levels in areas outside 25 miles.
- Decreasing levels of radioactivity in areas of previous deposition (e.g. area extending Northwest from accident site).
- No new areas of deposition have been identified.

Conclusion:

- Radiological material has not deposited in significant quantities in the areas measured since 19 March
-



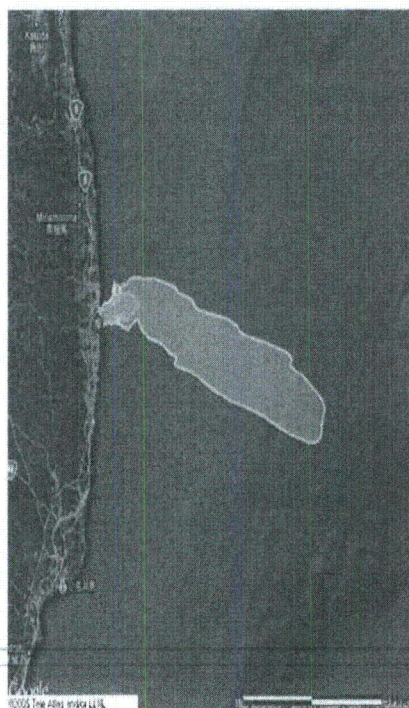
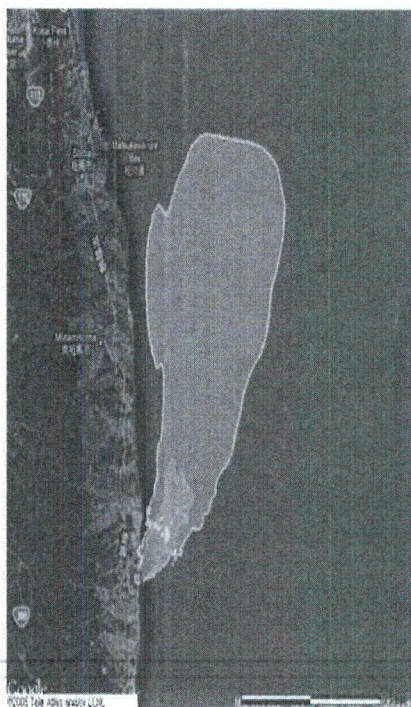
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Forecasted Weather March 28-29

03/28/2011 20:00:00 JST

03/29/2011 07:00:00 JST

03/29/2011 12:00:00 JST



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Planned Operations: Next 24 Hrs

Field Monitoring

- **AMS flight activities**

- **C-12:** Will refly west of the power plant and remap the 25 mile line in preparation for placement of the DEW.
- **UH-1:** Will fly north of Kitaibaraki over the Joban highway and then along highway 49 north to Fukushima. A ground team will drive the same route with the Sparks taking HPGe measurements along the way.
- **HH-60:** Will fly a block west of Fukushima to the coast, north of the 13 nautical mile line.

- **Ground Monitoring Activities**

- Ground teams will conduct road surveys north of Oyama in the Kanto prefecture
- Continue input to work on a surveillance platform to suspend from a crane over the plant to hold air sampling and other surveillance systems.

~~Continue joint Monitoring and Assessment planning with DoD (US AFRAT)~~

DOE will meet with GOJ representatives on 29 March to discuss additional collaboration for ground and aerial monitoring