

By Ed Tibbetts

[Quad-City Times](#), March 16, 2011

Mississippi Gov. Haley Barbour said Tuesday night in Davenport that there's a lot to learn from what's happening to Japan's nuclear plants in the wake of the earthquake and tsunami there, but the US still needs to boost its reliance on nuclear power.

In a 25-minute address that focused solely on the economy and fiscal issues, Barbour accused the Obama administration of ignoring the need to boost domestic energy production. And later, he told reporters there may be ways to improve safeguards at US plants, but the earthquake and tsunami are rare occurrences.

"We are looking here at an event, a 9.0 on the Richter scale earthquake, that is a one in how many hundreds or thousands of years event," he said.

Barbour said the US gets

20 percent of its energy from nuclear sources and it needs to boost that share. He said the country needs to rely on an array of sources for its energy needs, including oil, coal, gas — and ethanol.

The governor, who also is the former chair of the Republican National Committee, said he is "seriously considering" a presidential bid. And he spent two days in Iowa testing the waters, capping his trip with a fundraising dinner for the Republican Party of Iowa at the Radisson Quad-City Plaza.

Barbour has said he plans to make a decision on a bid in April, after his state's legislature adjourns. But other than saying he's seriously considering it, he gave no other clues what his decision might be.

The governor, with his southern drawl and homespun manner, got a warm reception from people who attended the dinner, the first in a series of events aimed at boosting state and county party finances.

"He's a very down-to-earth guy," said Jeff Havenner, Bettendorf.

John Ortega, also of Bettendorf, who is on the state GOP central committee, said Barbour's background as a governor is impressive. He said he was direct with people in a private meeting beforehand, answering questions. "He didn't hem and haw," he said.

In his remarks, Barbour criticized the Obama administration on a number of fronts, particularly spending. But he also said Republicans need to do more than just focus on the part of the budget that's drawing the most debate in Congress right now, what's called domestic discretionary spending. It accounts for less than 15 percent of total federal spending.

Barbour said Republicans must cut defense spending or lose credibility. When asked afterward where he might cut, he didn't point to a particular program but said a "tremendous amount" of money could be saved without cutting individual programs or weapons systems.

Barbour said the government also must address entitlements, and that Obama is "AWOL" on that. He also said the White House is hurting the economy by boosting government spending and crowding out private investment.

"How can a private economy grow when government sucks all the money out?" he asked.

Earlier in the day, Barbour met with Republican women in Des Moines. The day before he was in western Iowa.

Power Play: Haley Goes Nuclear (POLITCO)

By Kasie Hunt

[Politico](#), March 16, 2011

DAVENPORT, Iowa — The United States needs to rely more on nuclear power despite the escalating disaster in Japan, Haley Barbour told an audience of Iowa Republicans Monday night.

"There are many people, including me, who believe that it behooves us to increase that percentage [of nuclear power] so that other fuels can be used for other purposes," Barbour said. "We don't know what happened in Japan. We need to study and learn and make sure that we continue to have safe reliable clean nuclear energy in the United States."

"There is a lot of dramatization that may or may not be accurate," he told reporters after finishing his speech here to county activists and GOP leaders, adding, "There may be some lessons that we need to learn" from the Japanese disaster.

The remarks come a day after Barbour's press secretary lost his job because he joked about the tsunami that flooded Japan, killed thousands of people and has left the country threatened by a major nuclear meltdown.

Barbour's speech hammered over and over again on spending as the source of America's problems — and he said Republicans have to win the presidency in 2012 because America is worse off now than it was during Watergate and at the height of the Vietnam War.

"Until about two years ago, there was an expression, a statement that I had never heard made," Barbour said. "However every day, every week for the last year and half I've heard, 'I'm concerned my children and grandchildren are not going to inherit

the same country that I inherited.' I never heard that in the depths of Watergate, at the height of Vietnam, in Ronald Reagan's administration, Bill Clinton's administration."

Barbour, a former RNC chairman who has been working in politics since the mid-1970's, said that message "is a reminder of the stakes of this election — what we need to be focused on — and that is winning. Winning in 2012."

"Obama has unlimited faith in a limitless government," he said, echoing a line he used in a speech at the Chicagoland Chamber of Commerce Monday.

Barbour made his remarks at the Iowa GOP's Chairman's Speaker Series dinner here in Davenport. It's the conclusion of the Iowa tour he began Monday night in Sioux City, in the far western and most conservative corner of the state. He had lunch in Des Moines on Tuesday, where he met with state legislators at the state capitol and addressed the Iowa Federation of Republican Women. His final stop was in Davenport, in the Quad Cities, on the far eastern edge.

It's Barbour's second visit to the state in the last month, and he's slated to be back next week for Rep. Steve King's PAC gathering in Des Moines. He gave a major economic address Monday in Chicago, and he's also heading to New Hampshire on March 29, an aide said.

The uptick in activity is an unmistakable sign that Barbour is planning to run for president in 2012—though he steadfastly maintains he won't make a decision until the Mississippi state legislature wraps up its session at the end of April.

But Barbour's rollout hasn't been smooth so far. He's stumbled several times over issues of race, and his press secretary, Dan Turner, resigned Monday after POLITICO reported that Turner had joked about the Japanese tsunami in a morning press clipping email to Barbour's staffers. Barbour never received the emails, his aides said.

Still, Barbour is widely considered one of the best Republican strategists in the country, and has long-established goodwill with GOP officials at all levels of government. He was a longtime DC lobbyist, worked in the Reagan Administration and ran the Republican National Committee.

Obama Discusses Sandia Labs, LANL With KOAT (KOAT)

[KOAT-TV Albuquerque \(NM\)](#), March 16, 2011

WASHINGTON, D.C. — In an exclusive one-on-one interview, President Barack Obama told Action 7 News that the country needs to ensure the safety of nuclear facilities, including Sandia National Laboratories and the Los Alamos National Laboratory.

Obama said the focus in America is on our plants and the labs that conduct vital nuclear research after the nuclear events in Japan over the last week.

The primary mission of Sandia's Labs are to ensure the US nuclear arsenal is safe. LANL is also recognized for its nuclear weapons and research.

"I think it's very important to make sure that we are doing everything we can to ensure the safety and effectiveness of the nuclear facilities that we have," Obama said.

Congress is looking for ways to cut the federal budget and House Republicans have showed interest in slashing nuclear weapons spending. The move could affect the 20,000 employees at New Mexico's two research labs.

Obama said Japan's hardships are a reminder that the work at these facilities should not be scaled back.

"One of the things that 'it' reminds us of is that the safety and the constant monitoring and oversight that we're providing to our nuclear facilities here in the United States has to be maintained," Obama said.

The president said the money is there.

"We have a budget for it. I've already instructed our Nuclear Regulatory Agency to make sure that we take lessons learned from what's happened in Japan and that we are constantly upgrading how we approach our nuclear safety in our country," Obama said.

The Obama Administration is pushing for more funding, but Congress is grappling with less money and a growing deficit. Obama has promised American help to Japan as it recovers from the devastation.

The White House said nuclear power remains vital to US energy policy.

Local Experts Ready To Respond To Nuclear Crisis In Japan (OAKR)

By John Huotari

[Oak Ridger](#), March 16, 2011

OAK RIDGE, Tenn. —

A local team of experts trained to respond to radiation emergencies is ready to travel overseas within six hours if Japanese officials ask for help as they struggle to control nuclear power plants damaged by Friday's devastating earthquake and tsunami.

"In these types of situations, we are always on standby," said Albert Wiley, director of the Radiation Emergency Assistance Center/Training Site, or REAC/TS, at Methodist Medical Center of Oak Ridge.

The REAC/TS staff has been busy since the Friday earthquake and tsunami, which has left thousands of Japanese dead, missing, or homeless. Wiley said his staff has given advice to, and consulted with, private citizens, military personnel, the US Department of Energy, and embassy representatives in the United States and Japan.

"In general, they are asking us for guidelines on decontamination of people ... (and the) use of medical countermeasures such as Prussian blue and iodine – general advice and consultation on the medical management of contaminated people and exposed people," Wiley said.

He said some callers want assurances that they will be OK.

Death toll estimates in Japan have ranged as high as 10,000 or more, and there have been mounting concerns about potential reactor meltdowns after Friday's earthquake and tsunami on Japan's northeast coast shut down the electricity that runs crucial cooling systems.

If deployed, the REAC/TS staff would be sent overseas by the National Nuclear Security Administration, a US Department of Energy agency, primarily in response to requests from the Japanese government, Wiley said.

So far, though, "We know of no significant known public health exposures," Wiley said.

Still, REAC/TS staff and representatives, including Health Physics Project Manager Steve Sugarman, pointed out that they don't know many of the specifics of the nuclear crisis – including how many people might have been exposed to radiation or contaminated – and the "situation continues to evolve."

If deployed, a team could include a physician, health physicists, and nurse paramedic armed with radiation detector equipment and emergency medical supplies, including DTPA, which is used to treat people who are internally contaminated with actinides such as plutonium, and Prussian blue, used to treat cesium isotope contamination.

Wiley said the problems at the Japanese nuclear facilities are not comparable to the atomic weapons used on Japan during World War II or the Chernobyl disaster in Ukraine in 1986. Coupled with a bad explosion and fire at Chernobyl, that nuclear accident injected fission products high into the atmosphere, he said.

"We do not see anything like that going on here," Wiley said.

Asked if radiation releases could affect the United States, Wiley said: "We have no reason to believe that there is going to be any kind of release of fission products that would be a problem anywhere, even including Japan at this time."

With a full-time staff of 13 people, REAC/TS is managed for DOE by Oak Ridge Associated Universities. Workers are obligated to be able to deploy within four hours in response to domestic emergencies and within six hours to international calls.

Just last year, REAC/TS staff members provided radiation emergency medical training to Japanese officials, said Wendy West, ORAU manager of employee and public communications.

John Huotari can be contacted at (865) 220-5533.

W.H. Official: Lock Up IP Criminals (POLITCO)

By Jennifer Martinez

Politico, March 16, 2011

The White House's top intellectual property official wants stiffer prison sentences for those found guilty of crimes such as selling counterfeit goods for military or law enforcement use, and she also wants illegal streaming of online content to be made a felony level crime when appropriate.

The recommendations were among a set of 20 suggestions Victoria Espinel made to Congress on Tuesday.

Espinel called on lawmakers to pass legislation requiring tougher sentences for organized crime groups and gangs that deal in counterfeit goods or commit other IP crimes, as well as for repeat offenders.

"Because of the high profit margin and shorter prison sentence for intellectual property crimes compared to other offenses, piracy and counterfeiting are a strong lure to organized criminal enterprises, which can use infringement as a revenue source to fund their other unlawful activities," Espinel wrote in a blog post Tuesday.

She also wants lawmakers to enact longer sentences for people who transfer trade secrets outside of the US or peddle counterfeit drugs.

Espinel — the first White House IP czar ever — added that more legislative recommendations for Congress may be on the way in the next few months.

The White House also provided recommendations for how Congress can give law enforcement agencies the tools to crack down tougher on copyright infringement.

In the report, the administration calls for making illegal streaming of content over the Web a felony "in appropriate circumstances." It also calls for giving law enforcement the authority to seek a court order to conduct wiretaps in cases of criminal copyright and trademark offenses.

Additionally, the report asks for Congress to grant the Department of Homeland Security the authority to share with copyright holders, both before and after seizures, information about products and technology used by infringers to access copyrighted content.

Cracking down on the counterfeit drug trade has been a top priority for the IP chief's office in recent months and the report recommended a series of legislative changes intended to further clamp down on the problem. The administration called on Congress to enact a law that requires importers and pharmaceutical companies to flag the Food and Drug Administration and other agencies when they come across counterfeit medical devices and drugs.

In a nod to the recording industry, Espinel recommended that lawmakers enact legislation that requires recording artists and music artists to be paid a performance royalty when their music is played over the radio. If that law is enacted, music labels and performers will be able to collect royalty fees from overseas, the report said.

Various US industries, particularly the entertainment and pharmaceutical sectors, have been anxiously awaiting the release of Espinel's recommendations to Congress. Companies have complained to the administration about rogue sites affecting their bottom lines and sully their brand reputations to consumers. They have called on Congress to pass legislation that's tough on copyright violators.

The Chamber of Commerce said it was "encouraged" to see that many of Espinel's recommendations were similar to the list of IP policy recommendations it sent to Congress and the White House last month. The powerful business lobby also applauded the call for tougher punishment on illegal Web streaming.

"We know both the House and Senate are looking at this issue and encourage them to work closely with the administration and other stakeholders to combat this growing threat," said Rob Calia, the senior director for counterfeiting and piracy at the Chamber's Global IP Center.

And while advocacy group Public Knowledge has been critical of the administration's Web seizure operation, President Gigi Sohn said the recommendations "largely address important areas of intellectual property enforcement that are often overlooked in more contentious debates at the edges of these issues."

"While there may be room for disagreement on specific methods of implementation, Victoria Espinel has compiled a thoughtful list of targeted recommendations for enforcement," Sohn said.

IN THE BLOGS:

TSA Admits Bungling Of Airport Body-Scanner Radiation Tests (WIRED)

By David Kravets

Wired, March 15, 2011

The Transportation Security Administration is re-analyzing the radiation levels of X-ray body scanners installed in airports nationwide, after testing produced dramatically higher-than-expected results.

The TSA, which has deployed at least 500 body scanners to at least 78 airports, said Tuesday the machines meet all safety standards and would remain in operation despite a "calculation error" in safety studies. The flawed results showed radiation levels 10 times higher than expected.

At least one flier group, the Association for Airline Passenger Rights, is urging the government to stop using the \$180,000 machines that produce a virtual-nude image of the body until new tests are concluded in May.

"Airline passengers have enough concerns about flying — including numerous ones about how TSA conducts its haphazard security screenings — so it is TSA's responsibility to ensure passengers are not being exposed to unhealthy amounts of radiation," Brandon Macsata, executive director of the group, said in a statement.

The Electronic Privacy Information Center has been a loud voice opposing the machines. Last week, it urged a federal appeals court to stop using them until further health studies were conducted. Marc Rotenberg, EPIC's executive director, is expected to tell the same thing to a congressional panel Wednesday.

"The agency should have conducted a public rule-making so that these risks could have been more carefully assessed," (.pdf) according to a transcript of his expected testimony before the House Committee on Oversight and Government Reform.

Still, the government said the results proved the safety of the devices.

"It would appear that the emissions are 10 times higher. We understand it as a calculation error," TSA spokesman Sarah Horowitz said in a telephone interview.

The snafu involves tests conducted on the roughly 250 backscatter X-ray machines produced by Rapiscan of Los Angeles, which has a contract to deliver another 250 machines at a cost of about \$180,000 each. About 250 millimeter-wave technology machines produced by L-3 Communications of New York were not part of the bungled results.

Rapiscan technicians in the field are required to test radiation levels 10 times in a row, and divide by 10 to produce an average radiation measurement. Often, the testers failed to divide results by 10, Horowitz said.

"Certainly, the errors are not acceptable. It's not every report. We believe the technology is safe," she said. "We've done extensive, independent testing. It doesn't raise alarms in terms of safety."

Rapiscan, in a letter to the TSA, admitted the mistake and is "redesigning the form" used by its "field service engineers" when surveying the Rapiscan Secure 1000 that is deployed to 38 airports.

"Oftentimes, the FSE will bypass the step of dividing by 10. While the resulting entry, at a pragmatic level, is understandable on its face and usable for monitoring purposes, the value, if read literally by persons unfamiliar with our system and the survey process, would imply energy outputs that are unachievable by the Secure 1000 Single Pose," (.pdf) Rapiscan wrote.

A recent Wired.com three-part series examined the constitutionality, effectiveness and health concerns of the scanners, which the TSA mandated as the preferred airport screening method in February 2009. Among other things, the Wired.com series concluded that there was discord among the scientific community about the scanners' health risks to humans, and that they were not tested with mice or other biological samples before being deployed.

The government, however, maintains a thousand screenings equal the amount of radiation of one standard medical chest X-ray.

A federal appeals court hearing EPIC's lawsuit suggested last week it was not likely to halt the scanners' use.

INTERNATIONAL NUCLEAR NEWS:

Japan Faces Potential Nuclear Disaster As Radiation Levels Rise (NYT)

By Hiroko Tabuchi, David E. Sanger, Keith Bradsher

[New York Times](#), March 15, 2011

TOKYO — Japan's nuclear crisis verged toward catastrophe on Tuesday after an explosion damaged the vessel containing the nuclear core at one reactor and a fire at another spewed large amounts of radioactive material into the air, according to statements from Japanese government and industry officials.

In a brief address to the nation at 11 a.m. Tokyo time, Prime Minister Naoto Kan pleaded for calm, but warned that radiation had already spread from the crippled reactors and there was "a very high risk" of further leakage. Fortunately, the prevailing winds were sweeping most of the plume of radioactivity out into the Pacific Ocean, rather than over populated areas.

The sudden turn of events, after an explosion Monday at one reactor and then an early-morning explosion Tuesday at yet another — the third in four days at the plant — already made the crisis at the Fukushima Daiichi Nuclear Power Station the worst nuclear accident since the Chernobyl reactor disaster a quarter century ago.

It diminished hopes earlier in the day that engineers at the plant, working at tremendous personal risk, might yet succeed in cooling down the most damaged of the reactors, No. 2, by pumping in seawater. According to government statements, most of the 800 workers at the plant had been withdrawn, leaving 50 or so workers in a desperate effort to keep the cores of three stricken reactors cooled with seawater pumped by firefighting equipment, while crews battled to put out the fire at the No. 4 reactor, which they claimed to have done just after noon on Tuesday.

That fourth reactor had been turned off and was under refurbishment for months before the earthquake and tsunami hit the plant on Friday. But the plant contains spent fuel rods that were removed from the reactor, and experts guessed that the pool containing those rods had run dry, allowing the rods to overheat and catch fire. That is almost as dangerous as the fuel in working reactors melting down, because the spent fuel can also spew radioactivity into the atmosphere.

After an emergency cabinet meeting, the Japanese government told people living within about 20 miles of the Daiichi plant to stay indoors, keep their windows closed and stop using air conditioning.

Mr. Kan, whose government was extraordinarily weak before the sequence of calamities struck the nation, told the Japanese people that "although this incident is of great concern, I ask you to react very calmly." And in fact, there seemed to be

little panic, but huge apprehension in a country where radioactivity brings up memories of Hiroshima and Nagasaki, the haunting images of post-war Japan.

The two critical questions over the next day or so are how much radioactive material is spewed into the atmosphere, and where the winds carry it. Readings reported on Tuesday showed a spike of radioactivity around the plant that made the leakage categorically worse than in had been, with levels measured at one point as high as 400 millisieverts an hour. Even 7 minutes of exposure at that level will reach the maximum annual dose that a worker at an American nuclear plant is allowed. And exposure for 75 minutes would likely lead to acute radiation sickness.

The extent of the public health risk depends on how long such elevated levels persist — they may decline because the fire at No. 4 reactor was extinguished — as well as how far and fast the radioactive materials spread, and whether the limited evacuation plan announced by the government proves sufficient.

In Tokyo, 170 miles south of the plant, the metropolitan government said Tuesday it had detected radiation levels 20 times above normal over the city, though it stressed that that level posed no immediate health threat. In Ibaraki Prefecture, just south of Fukushima Prefecture where the plant is located, the amount of radiation reached 100 times the usual levels.

The succession of problems at Daiichi was initially difficult to interpret, with confusion compounded by incomplete and inconsistent information provided by government officials and executives of the plant's operator, Tokyo Electric Power Company.

But industry executives in close contact with officials in Japan expressed extreme concern that the authorities were close to losing control over the fuel melting that has been ongoing in three reactors at Daiichi, especially at the crippled No. 2 reactor where the containment vessel was damaged.

Tokyo Electric Power said Tuesday that after the explosion at the No. 2 reactor, pressure had dropped in the "suppression pool" — a section at the bottom of the reactor that converts steam to water and is part of the critical function of keeping the nuclear fuel protected. After that occurred, radiation levels outside No. 2 were reported to have risen sharply.

"We are on the brink. We are now facing the worst-case scenario," said Hiroaki Koide, a senior reactor engineering specialist at the Research Reactor Institute of Kyoto University. "We can assume that the containment vessel at Reactor No. 2 is already breached. If there is heavy melting inside the reactor, large amounts of radiation will most definitely be released."

Another executive said the chain of events at Daiichi suggested that it would be difficult to maintain emergency seawater cooling operations for an extended period if the containment vessel at one reactor had been compromised because radiation levels could threaten the health of workers nearby.

If all workers do in fact leave the plant, the nuclear fuel in all three reactors is likely to melt down, which would lead to wholesale releases of radioactive material — by far the largest accident of its kind since Chernobyl.

Even if a full meltdown is averted, Japanese officials have been facing unpalatable options. One was to continue flooding the reactors and venting the resulting steam, while hoping that the prevailing winds did not turn south toward Tokyo or west, across northern Japan to the Korean Peninsula. The other was to hope that the worst of the overheating was over, and that with the passage of a few more days the nuclear cores would cool enough to essentially entomb the radioactivity inside the plants, which clearly will never be used again. Both approaches carried huge risks.

While Japanese officials made no comparisons to past accidents, the release of an unknown quantity of radioactive gases and particles — all signs that the reactor cores were damaged from at least partial melting of fuel — added considerable tension to the effort to cool the reactors.

"It's way past Three Mile Island already," said Frank von Hippel, a physicist and professor at Princeton. "The biggest risk now is that the core really melts down and you have a steam explosion."

The sharp deterioration came after a frantic day and night of rescue efforts focused largely on the No. 2 reactor. There, a malfunctioning valve prevented workers from manually venting the containment vessel to release pressure and allow fresh seawater to be injected into it. That meant that the extraordinary remedy emergency workers had jury-rigged to keep the nuclear fuel from overheating no longer worked.

As a result, the nuclear fuel in that reactor was exposed for many hours, increasing the risk of a breach of the container vessel and more dangerous emissions of radioactive particles.

By Tuesday morning, Tokyo Electric Power said that it had fixed the valve and resumed seawater injections, but that it had detected possible leaks in the containment vessel that prevented water from fully covering the fuel rods.

Then an explosion hit that reactor. After a series of conflicting reports about what level of damage was inflicted on the reactor after that blast, Japan's chief cabinet secretary, Yukio Edano said, "there is a very high probability that a portion of the containment vessel was damaged."

The steel containment vessels that protect nuclear fuel in reactors are considered crucial to maintain the integrity of the reactor and the safety of the fuel.

Mr. Edano, however, said that the level of leaking at the No. 2 reactor remained small, raising the prospect that the container was sufficiently intact to protect the nuclear fuel inside.

New Reactor Fire As Japan Works To Contain Threat (AP)

By Eric Talmadge And Shino Yuasa, Associated Press

[Associated Press](#), March 16, 2011

SOMA, Japan — A fire broke out at a nuclear reactor again Wednesday, a day after the power plant emitted a burst of radiation that panicked an already edgy Japan and left the government struggling to contain a spiraling crisis caused by last week's earthquake and tsunami.

The outer housing of the containment vessel at the No. 4 unit at the Fukushima Dai-ichi nuclear complex erupted in flames early Wednesday, said Hajimi Motujuku, a spokesman for the plant's operator, Tokyo Electric Power Co.

On Tuesday, a fire broke out in the same reactor's fuel storage pond — an area where used nuclear fuel is kept cool — causing radioactivity to be released into the atmosphere. Tokyo Electric Power said the new blaze erupted because the initial fire had not been fully extinguished.

About three hours after the blaze erupted Wednesday, Japan's nuclear safety agency said fire and smoke could no longer be seen at Unit 4, but that it was unable to confirm that the blaze had been put out.

Radiation levels in areas around the nuclear plant rose early Tuesday afternoon but appeared to subside by evening, officials said. But the unease remained in a country trying to recover from the massive disasters that are believed to have killed more than 10,000 people and battered the world's third-largest economy.

The radiation leak caused the government to order 140,000 people living within 20 miles (30 kilometers) of the plant to seal themselves indoors to avoid exposure, and authorities declared a ban on commercial air traffic through the area. Worries about radiation rippled through Tokyo and other areas far beyond that cordon. The stock market plunged for a second day, dropping 10 percent.

The troubles cascaded Tuesday at the Dai-ichi plant, where there have already been explosions at two reactor buildings since Friday's disasters. An explosion at a third reactor blasted a 26-foot (8-meter) hole in the building and, experts said, damaged a vessel below the reactor, although not the reactor core. Three hours later, a fire broke out at a fourth reactor, which had been offline for maintenance.

In a nationally televised address Tuesday, Prime Minister Naoto Kan said radiation had seeped from four of the plant's six reactors. The International Atomic Energy Agency said Japanese officials informed it that the fire was in a pool where used nuclear fuel rods are stored and that "radioactivity is being released directly into the atmosphere." Long after the fire was extinguished, a Japanese official said the pool might still be boiling.

Depending on how bad the blast was at Unit 2, experts said more radioactive materials could seep out. If the water in the storage pond in Unit 4 boils away, the fuel rods could be exposed, leaking more virulent radiation.

Experts noted that much of the leaking radiation was apparently in steam from boiling water — and the falling radiation levels suggest the situation could be stabilizing.

Government spokesman Yukio Edano said the radiation leak potentially affected public health. But authorities and experts said the risks to the public diminished the farther the distance from the plant. At its most intense, the leak released a radioactive dose in one hour at the site 400 times the amount a person normally receives in a year. Within six hours, that level had dropped dramatically.

A person would have to be exposed to that dose for 10 hours for it to be fatal, said Jae Moo-sung, a nuclear engineering expert at Seoul's Hanyang University.

Radiation elsewhere never reached that level. In Tokyo, 170 miles (270 kilometers) to the southwest, authorities reported radiation levels nine times normal — too small, officials said, to threaten the 39 million people in and around the capital. Weather patterns helped, shifting Tuesday night to the southeast, blowing any potential radiation from the plant toward the sea.

"It's not good, but I don't think it's a disaster," said Steve Crossley, an Australia-based radiation physicist. "If the radioactive material gets out, it's a major problem. That doesn't appear to be happening in Japan, and that's the big difference. As long as you are not near it, it doesn't pose a health risk."

The IAEA said Tuesday that all other Japanese nuclear plants were in a safe and stable condition.

Though Kan and other officials urged calm, the developments fueled a growing panic in Japan and around the world amid widespread uncertainty over what would happen next. In the worst case scenario, one or more of the reactor cores would completely melt down, a disaster that could spew large amounts of radioactivity into the atmosphere.

Foreigners began leaving in larger numbers. China organized an evacuation of its citizens from Japan's stricken northeast. The US urged Americans to avoid travel to Japan. Austria moved its embassy from Tokyo to Osaka. Lufthansa diverted its two daily flights to Tokyo to other Japanese cities.

The US Navy shifted some ships from Japan's east coast to western waters to avoid hazards from debris dragged into the sea by the tsunami and to be away from any radiation plume. One ship at its base south of Tokyo detected low levels of radiation from the Fukushima plant.

In evacuation centers for people living near the plant, Japanese worried about radiation contamination, calling it an unseen threat, and complained that the government was not forthcoming with information.

"Nuclear power is the most frightening, even more than a tsunami. The government, the ruling party, administrators, nobody tells us, the citizens, what is really happening," Isao Araki, 63, said at an evacuation center.

Kan's government has been more open and transparent than previous administrations in keeping the nation informed of developments in the nuclear crisis. Edano, his top spokesman, appears frequently before the press with updates that have been widely praised for their frankness and clarity.

However, given past governments' notorious record of covering up bad news on nuclear emergencies, many Japanese are skeptical they are getting a complete picture.

The radiation fears added to the catastrophe that has been unfolding in Japan. Four days after the 9.0-magnitude earthquake and tsunami, millions of people strung out along the east coast had little food, water or heat, and already chilly temperatures dropped further as a cold front moved in. Up to 450,000 people are in temporary shelters.

Officials have only confirmed about 3,300 deaths, but officials have said the toll was likely to top 10,000 in one of the four hardest-hit areas. Experts involved in the 2004 Asian tsunami said there was no question more people died, despite Japan's high state of preparation, and like the earlier disaster, many thousands may never be found.

In a rare bit of good news, rescuers found two survivors Tuesday, one of them a 70-year-old woman whose house was torn off its foundation by the tsunami.

Mostly, though, search teams found few signs of life. More than 200 rescue crews from the US and Britain poured Tuesday into the coastal city of Ofunato, finding little but rubble and people looking for lost possessions. Whole city blocks lay flattened. A yacht came to rest atop the remains of a two-story gas station.

Amid the debris, 32-year-old Ken Suiyoa used a crowbar to try to force open a safe, which he said had been thrown from his father's destroyed home and into a trench.

"My house has gone, our family's restaurant has gone, our car has gone — this is part of what we have left," he said, gesturing to unyielding gray metal.

As rescue teams and survivors hunted through ruined communities and officials struggled to deliver supplies to the displaced, urgent attention was focused on the Fukushima Dai-ichi nuclear complex, the most severely damaged of three nuclear plants on the battered coast. Three of the plant's six reactors were out of service for maintenance at the time of Friday's disasters, which compromised cooling systems at all of the reactors. Before Tuesday's fire in Unit 4's storage pool, workers were desperately trying to pump seawater to cool the fuel rods in the three active reactors.

Conditions in Unit 2 are less clear after a blast near a suppression pool, into which fuel rods are plunged to cool them and which also serves as an emergency receptacle for excess steam, said plant owner Tokyo Electric Power Co. The nuclear core was not damaged but the bottom of the surrounding container may have been, said Shigekazu Omukai, a spokesman for Japan's nuclear safety agency.

The IAEA's head, Yukioya Amano, urged the Japanese government to provide better information to the agency about the situation.

Temperatures in the two other offline reactors, units 5 and 6, were slightly elevated, said Edano, the chief cabinet secretary. Fourteen pumps have been brought in to get seawater into the other reactors, and technicians were trying to figure out how to pump water into Unit 4, where the storage pool fire occurred. Early Wednesday, Tokyo Electric Power officials said they had scrapped a plan to use helicopters, deeming them impractical, and said they were considering other options, including using fire engines.

About 70 workers remained at the complex, struggling with its myriad problems. The workers, all in protective gear, are being rotated in and out of the danger zone quickly to reduce their radiation exposure.

The prime minister and other officials warned there is a danger of more leaks and ordered a wider emergency cordon, telling people within 20 miles (30 kilometers) of the Fukushima plant to stay indoors to avoid exposure that could make people sick.

"Please do not go outside. Please stay indoors. Please close windows and make your homes airtight," Edano told residents in the danger zone.

"These are figures that potentially affect health. There is no mistake about that," he said.

Some 70,000 people had already been evacuated from a 12-mile (20-kilometer) radius from the Dai-ichi complex. About 140,000 remain in the wider zone.

The multiple problems at Fukushima appear to be the nuclear industry's most severe accident in 25 years, since the meltdown at the Chernobyl power plant in the former Soviet Union.

Experts said that differing designs in the reactors made it unlikely that Fukushima would degenerate into a widespread contamination problem. The biggest difference is that in Chernobyl's case the reactor core caught fire and there was no containment shell — thick reinforced concrete around the reactor.

"We're a long way from fuel material coming out of the reactor in the way it did in Chernobyl," said Crossley, the physicist. "In this case, the fuel is still contained."

Physicist Edwin Lyman of the Union of Concerned Scientists, an advocacy group that pushes for nuclear industry safety, said it was unlikely that a plume from the Fukushima plant would rise as high as the one from Chernobyl, which means that radioactive material would be deposited closer to the site.

"That may spare Tokyo from the worst of it," he said.

Yuasa reported from Tokyo. Associated Press writer Elaine Kurtenbach in Tokyo and David Stringer in Ofunato contributed to this report.

Fire Erupts Again At Fukushima Daiichi's No. 4 Reactor; Nuclear Fuel Rods Damaged At Other Reactors (LAT)

Fire breaks out for the second time at the No. 4 reactor of the Fukushima Daiichi nuclear complex. Meanwhile, a report says about 70% of the nuclear fuel rods at the No. 1 reactor have been damaged, along with 33% of the rods at the No. 2 reactor.

By Carol J. Williams

[Los Angeles Times](#), March 16, 2011

Another fire at Japan's stricken Fukushima Daiichi nuclear power complex broke out early Wednesday and authorities said about 70% of another reactor's fuel rods had been damaged by the spate of accidents and breakdowns since Friday's earthquake and tsunami.

The ominous disclosure, after authorities insisted throughout the previous day that damage to the overheating reactors was negligible, compounded a sense of escalating hazards and fear five days after the disasters expected to take historic peacetime tolls on Japan's people and economy.

"An estimated 70 percent of the nuclear fuel rods have been damaged at the troubled No. 1 reactor of the Fukushima (Daiichi) No. 1 nuclear power plant, and 33 percent at the No. 2 reactor," Kyodo news agency reported Wednesday, quoting an unnamed official of the Tokyo Electric Power Co. that operates the stricken power complex.

The latest blaze thwarting containment efforts broke out in the No. 4 reactor earlier in the day. It was attributed to disaster responders having failed to fully extinguish a fire that struck the same reactor on Tuesday.

The reported partial meltdowns of the No. 1 and No. 2 reactor cores were thought to be responsible for the plume of radiation that escaped Tuesday, sending background radiation levels soaring to degrees that authorities conceded were harmful to anyone with prolonged exposure.

With the confirmed dead and known missing topping 10,000 and untold thousands of others suspected to still be buried in the sodden wreckage littering the northeast shores of Honshu island, Japan's mainland, government leaders urged calm and patience as hardships persisted four days after the worst earthquake in Japan's recorded history.

Photos: Scenes of earthquake destruction

The devastating tsunami that followed inflicted most of the damage half an hour after Friday's magnitude 9.0 quake, and a terrifying spate of fires, explosions and missteps at the nuclear power complex in Fukushima prefecture has intensified fears of another calamity.

Radiation released from the six-reactor Fukushima Daiichi complex Tuesday caused a 400-fold increase in background levels outside the stricken plant and about 10 times the normal level in Tokyo, the usually thriving capital 150 miles south of the power facility. Those levels described by a top government official as hazardous to human health declined overnight, suggesting

the situation might be stabilizing at the three reactors experiencing cooling problems in the nuclear fuel containment vessels, officials said.

The latest fire, reported by Tokyo Electric Power Co. spokesman Hajimi Motujuku, compounded the woes besetting a skeleton crew of about 70 nuclear plant workers struggling to cool the damaged reactors and avert an uncontrolled release of radiation.

Radiation detected near the plant early Wednesday was insufficient to harm human health, Chief Cabinet Secretary Yukio Edano told reporters. He said the levels had also dropped to about twice the usual level in Tokyo, a negligible level that posed no public hazard, he said.

Any risks posed by the emissions were eased by prevailing winds that carried the steam out to sea rather than over the populated inland, the national meteorological agency noted.

NHK television said 450,000 people remained in makeshift shelters outside the evacuated areas, down by about 100,000 from a day earlier as those made homeless by the earthquake and tsunami began making their way to less-affected areas to stay with relatives and friends.

But authorities still struggled to get food, blankets and other relief to the displaced amid continuing road blockages and idled transport between Japan's major cities and the hard-hit agricultural and fishing areas of the northeast.

Three new earthquakes with a magnitude greater than 6.0 hit across a wide swath of Honshu on Tuesday, as well as more than a dozen that registered over magnitude 5.0, the US Geological Survey reported.

Search-and-rescue teams from around the world scoured the wreckage of residential areas where the tsunami dumped tons of debris along miles of coastline. But the operations have ground down into a body-retrieval exercise, with only two survivors reported to have been rescued by Tuesday.

The international outpouring of help for Japan brought in a response from 91 nations and at least a dozen multinational relief organizations, the Japanese Foreign Ministry reported. Most were concentrating on devastated Miyagi prefecture, deploying heavy-lifting equipment to pry loose cars, trucks, boats and other objects from the rubble of wood and metal churned and scattered by the tsunami.

In Sendai, the city of 1 million closest to the earthquake's offshore epicenter, sleet began pelting the ravaged area overnight, a precursor to the snow and falling temperatures forecast for the rest of the week.

As economists began estimating the cost of the disasters, predicting they would exceed those inflicted by Hurricane Katrina in both money and lives, Tokyo's Nikkei index plummeted for a second day, losing another 10% of its value.

Nuclear Crisis Deepens As Third Reactor Loses Cooling Capacity (WP)

By Steven Mufson And Chico Harlan

[Washington Post](#), March 15, 2011

Japan's nuclear emergency grew more dire on Tuesday after the third explosion in four days rocked the seaside Fukushima Daiichi complex and fire briefly raged in a storage facility for spent fuel rods at a fourth, previously unaffected reactor.

Officials from Tokyo Electric Power Co., owner of the nuclear complex, said radioactive substances were emitted after a 6:14 a.m. explosion, which took place in the unit 2 reactor. The blast took place near or in the suppression pool, which traps and cools radioactive elements from the containment vessel, officials said. The explosion appeared to have damaged valves and pipes, possibly creating a path for radioactive materials to escape.

Prime Minister Naoto Kan told the nation Tuesday morning that radiation had already spread from the reactors and there was "still a very high risk of further radioactive material escaping." He advised people within 19 miles of the plant to remain indoors. He urged calm.

Tokyo Electric, which over the weekend said it had 1,400 people working at the complex, said it was evacuating all but 50 workers. Kan hailed those workers, who he said "are putting themselves in a very dangerous situation."

The setbacks came as Tokyo Electric was still wrestling to regain control of ultra-hot fuel rods in two other nuclear units, numbers 1 and 3, by flooding them with sea water.

Tuesday began with a fire that broke out in a pool storing spent fuel rods at the base of unit 4, which had been shut down for inspection before last Friday's earthquake. Radioactive substances might have spewed outside from the fire.

Half an hour later, the explosion at unit 2 took place. Experts said that, unlike the two previous explosions that destroyed outer buildings, this explosion might have damaged portions of the containment vessel designed to bottle up radioactive materials in the event of an emergency.

The explosion — more serious than the earlier ones — was followed by a brief drop in pressure in the vessel and a spike in radioactivity outside the reactor to levels more than eight times what people ordinarily receive in a year, the company said.

The new setbacks came on the heels of a difficult Monday at Fukushima Daiichi unit 2. Utility officials there reported that four out of five water pumps being used to flood the reactor had failed and that the other pump had briefly stopped working. As a result, the company said, the fuel rods, normally covered by water, were completely exposed for 140 minutes.

That could have grave consequences, worsening the partial meltdown that most experts think is underway. By comparison, in the 1979 Three Mile Island, Pennsylvania nuclear plant accident, it took just two hours for half the plant's nuclear fuel to melt.

According to a report by the Kyodo News agency, the fifth pump was later restarted, and seawater mixed with boron was again injected in a desperate bid to cool the reactor, but the fuel rods remained partially exposed and ultra-hot. On Tuesday morning, Tokyo Electric said that 2.7 meters, or less than half, of the rods were still exposed.

The other four pumps were thought to have been damaged by a blast Monday that destroyed a building at the nearby unit 3 reactor, Kyodo reported. That blast, like one on Saturday at unit 1, was caused by a buildup in hydrogen generated by a reaction that took place when the zirconium alloy wrapped around the fuel rods was exposed to steam at 2,200 degrees Fahrenheit.

The International Atomic Energy Agency reported that injections of seawater into units 1 and 3 had been interrupted because of a low level in a seawater supply reservoir, but the seawater injections were later restored.

A commercial satellite photo of the complex showed piles of debris on top of units 1 and 3, which raised new fears about the condition of the pools where spent fuel is stored, especially at unit 1, where a design by General Electric placed the pool on top of the reactor but below the outer structure that was destroyed. But the ability of workers to assess the damage was hindered by fears that another explosion might occur.

In March 2010, 1,760 tons of spent fuel was stored in the six pools, 84 percent of capacity, according to Tokyo Electric.

After Monday's explosion at unit 3, Japanese government officials were quick to assert that it did not damage the core containment structure, and they said there would be little increase in radiation levels around the plant. But the explosion prompted Japan's nuclear agency to warn those within 12 miles to stay indoors. The blast also injured 11 people, one seriously.

The string of earthquake- and tsunami-triggered troubles at the Fukushima Daiichi plant began Friday, when a loss of grid power (caused by the earthquake) followed by a loss of backup diesel generators (caused by the tsunami) led to the failure of cooling systems needed to keep reactor cores from overheating.

The IAEA reported that Japan has evacuated 185,000 people from towns near the nuclear complex. The agency said Japan has distributed 230,000 units of stable iodine to evacuation centers from the area around the Fukushima Daiichi and Fukushima Daini nuclear power plants. The iodine has not been administered to residents; the distribution is a precautionary measure.

The ingestion of stable iodine can help to prevent the accumulation of radioactive iodine in the thyroid.

The US Seventh Fleet said Monday that some of its personnel, who are stationed 100 miles offshore from the Fukushima Daiichi plant, had come into contact with radioactive contamination. The airborne radioactivity prompted the fleet to reposition its ships and aircraft.

Setback In Reactor Fight (WSJ)

By Yuka Hayashi, Andrew Morse

[Wall Street Journal](#), March 16, 2011

Full-text stories from the Wall Street Journal are available to Journal subscribers by clicking the link.

Japan Works To Contain Nuclear Threat After Quake (USAT)

By Dan Vergano, Usa Today

[USA Today](#), March 16, 2011

A skeleton crew of workers fought to forestall disaster Tuesday at an embattled Japanese nuclear plant, even as earthquake aftershocks and a radiation-spewing fire at the facility rattled the nation.

The fourth day of the crisis at Japan's Fukushima Dai-ichi nuclear plant, northeast of Tokyo, came as the island nation recovered from Friday's magnitude 9.0 earthquake and a tsunami that has killed perhaps 10,000 people.

The plant's reactors have repeatedly vented small amounts of radioactive gas in the crisis, the result of deliberate moves to release pressure in the reactors. "There is still a very high risk of more radiation coming out," Japanese Prime Minister Naoto Kan warned his country early Tuesday.

The two-hour fire at one of the plant's reactor buildings apparently heated used-up nuclear fuel rods kept in a water pool there, triggering the release of radioactive steam that briefly spiked radiation levels to more than 160 times the yearly dose a

person naturally receives in a year. Plant officials had considered using helicopters to refill the spent fuel water pool, to avoid worker exposure to the high-radiation zone of that building, but, are now considering using fire hoses instead.

A second fire was reported Wednesday in the same building by plant officials. Tokyo Electric Power Co. spokesman Hajimi Motujuku says the blaze erupted early Wednesday in the outer housing of the reactor's containment vessel. Fire fighters are trying to put out the flames. Japan's nuclear safety agency also confirmed the fire, whose cause was not immediately known.

High radiation levels prompted an evacuation of the plant early Tuesday, leaving only 50 workers in radiation suits behind to continue pouring seawater into three overheating reactors. "They are doing a heroic job," said Anthony Pietrangelo of the Nuclear Energy Institute, an industry organization in Washington D.C.. "I can't pretend to understand what it means to be hit by an earthquake of that magnitude and then a horrendous tsunami."

Most troubling, one reactor showed signs of leaks following an earlier explosion at the facility. Such a leak in the steel-and-concrete containment vessel that houses the nuclear core of a reactor posed the biggest threat of a "major radiological event" yet in the crisis, said Pietrangelo and others.

The Dai-ichi plant had automatically stopped its three operating reactors when the Friday earthquake hit, but the tsunami knocked out cooling of the plant's still-hot nuclear fuel rods. Pietrangelo compared the crisis to 1979's Three Mile Island Disaster, where about half of the nuclear fuel in one reactor melted.

In a bid to forestall a similar fate for the plant's three working reactors — all likely containing partly melted fuel rods already — engineers continued to pour seawater into them.

Japanese officials indicated Tuesday that water levels at two of the reactors seem stable, but are fluctuating at the reactor showing signs of a leak. Keeping the fuel rods cool is the key to preventing a larger meltdown and an even bigger release of radiation.

"They're operating with razor thin margins," said nuclear energy expert David Lochbaum of the Union of Concerned Scientists, which opposes building more nuclear plants. Hydrogen gas explosions at the facility have injured 15 workers and damaged the outer buildings housing all three reactors.

In a last-ditch move, the seawater cools the rods, which boil the water, creating steam. The steam needs to be vented to release pressure on the reactor chamber. More water can then be added to keep the rods immersed.

"Seawater isn't what you would want to be normally using for this operation," says nuclear engineer Brian Woods of Oregon State University in Corvallis. "As long as that seawater is keeping things cool, though, there should be relatively little radioactive gas released."

Keeping the rods covered with water stifles a chemical reaction between steam and the metal covering the fuel rods that makes hydrogen gas. Ideally, he says engineers will "close the cycle" of dumping seawater into the reactors and venting radioactive gas from them in the next few weeks. Reconnecting outside electrical power to the plant would allow engineers to restart the cooling equipment that normally controls reactor temperatures.

"That's the next step, getting that powerful cooling started," Woods says.

Fire Breaks Out As Reactor Problems Grow (FT)

By Jonathan Soble And Michiyo Nakamoto

[Financial Times](#), March 16, 2011

Full-text stories from the Financial Times are available to FT subscribers by clicking the link.

'Worst Case' Nuclear Disaster Hangs On Unlikely Events (BLOOM)

By Mehul Srivastava And Adi Narayan

[Bloomberg News](#), March 16, 2011

For Tokyo Electric Power Co.'s stricken nuclear reactors to release catastrophic amounts of radioactive material into the atmosphere, a rare chain of events needs to happen.

Averting a full-scale meltdown — which scientists say isn't likely — depends on cooling the uranium-containing rods at Fukushima Dai-Ichi's Reactor No. 2, said S.K. Malhotra, a scientist at India's Department of Atomic Energy in Mumbai. A worst-case outcome may occur if overheating in the reactor culminates in the rupture of the steel lining protecting radioactive material.

"In the worst scenario, an explosion could occur inside the steel pressure vessel, fuel bundles melt down and the radioactivity is exposed," Malhotra said in a phone interview. "I would say there is a 10 percent probability still."

Japan, which has no significant oil and gas resources, is struggling to avert a meltdown at the power plant after the earthquake on March 11 caused a tsunami that disabled critical cooling systems.

Prime Minister Naoto Kan said the danger of radiation leaks increased at the nuclear facility, located 135 miles (220 kilometers) north of Tokyo. That sent the nation's Topix stock index to its biggest two-day drop since 1987 as concern grew over the government's ability to contain the crisis.

Tokyo Electric has struggled to keep the reactors flooded with water to prevent them becoming so hot that they melt through their steel casing. The partially submerged fuel rods are generating heat, turning water into high-pressure steam inside the core of the plant.

If hot enough, they also start a chemical reaction with their protective coating which produces a small amount of radioactive byproducts, and increases pressure within the core. That pressure is released by letting this combination of steam and gas flow into external chambers, one of which, in reactor unit 2, was rocked by an explosion at about 6 a.m. local time yesterday.

The explosions are frustrating cooling efforts at the nuclear facility, and may have damaged a key containment chamber, said Toshihoro Bannai, director of international relations at Japan's Nuclear and Industrial Safety Agency.

Rods inside three of the reactors have been partially exposed, according to Tokyo Electric. The fuel rods in reactor No. 2 were not fully submerged in water for at least 5 1/2 hours at that time as the utility reduced the number of workers because of increased radiation risks, the company said.

"What we are looking at is a long-term cooling problem," John Prince, a former member of the Safety Policy Unit of the U.K. National Nuclear Corp., told reporters in Adelaide, Australia.

The cooling process stopped after diesel generators pumping water to the plant were disabled by the tsunami, according to information Japanese authorities shared with the World Association of Nuclear Operators.

As the water supply stopped, temperatures inside the core rose, causing a buildup of pressure steam inside a containment area. Some of the vapor was vented to relieve the pressure, leaking a small amount of radioactive material into the environment.

Radiation outside the plant dropped to 0.6 millisieverts per hour from 11.9 millisieverts per hour, the agency said yesterday. Radiation peaked at 400 millisieverts per hour earlier in the day, the International Atomic Energy Agency said yesterday.

The temperature inside the core is "likely to be stable," said Bannai at Japan's safety agency, adding that most of the measuring equipment was "debilitated." Engineers have used secondary generators to pump seawater and boron into the core of the 40-year-old boiling-water reactor.

Without cooling water, the rods heat up. At about 1,100 degrees Celsius, the water and the zirconium metal encasing the uranium reacts to create hydrogen. Some of the hydrogen generated in this process was vented, leaked into the reactor building and exploded on contact with oxygen on at least three occasions.

A fourth blast that occurred at Reactor No. 2 yesterday may have damaged one of the layers designed to contain both the core and the radioactive material, according to Tokyo Electric. Any serious breach of the containment layers can allow potentially dangerous radiation leakage.

Material released through a serious breach in the defenses of the nuclear core, or the containment units, would travel through the atmosphere, depending upon weather conditions. An explosion would spread them further, as would heavy winds. The French, German and Chinese embassy in Tokyo recommended their citizens leave the city.

There are no indications so far that any radioactive material will reach Tokyo, said Gerald Laurence, an adjunct professor of chemistry at the University of Adelaide.

IAEA Director General Yukiya Amano said the new information about damage to reactors 1 and 2 is "worrying." Reactor No. 2's core damage may be 5 percent while reactor damage at unit No. 1 is below 5 percent, Amano said at a press briefing yesterday. The suppression chamber in reactor No. 2 also appears to be damaged, he said.

The IAEA still doesn't know the cause of a fire at the cooling pond of reactor No. 4, where spent fuel rods are stored, and is asking the Japanese government to improve the information it shares with the Vienna-based agency, Amano said.

Three of six reactors were operating at the time of the temblor. Nuclear fission in the functioning reactors stopped within 90 seconds of a power outage caused by the earthquake. Nuclear material can take weeks to cool down completely after the plant is shut down, the nuclear operators association said.

It's unlikely nuclear fuel will be released in an event reminiscent of the accident at the Chernobyl Nuclear Power Plant in Ukraine, said David Fletcher, an adjunct professor of chemical and biomolecular engineering at the University of Sydney, who studied the 1986 disaster while working for the U.K. Atomic Energy Authority.

"The worst you can conceive of is losing a lot of fission products into the atmosphere," Fletcher said. "People think of this scenario where the fuel melts and fails the vessel, and you've got this pile of radioactive fuel in a molten state underneath it. I don't think for a moment that could happen in a modern reactor because they have sufficient cooling to stop that happening."

Radiation exposure hospitalized one Tokyo Electric worker and the company has reduced the number of engineers working on cooling reactor No. 2 because of increased radiation readings, said Bannai. Eleven more workers were injured in this morning's explosion.

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Public Order Still Rules Amid Devastation In Japan (USAT)

By Calum Macleod

[USA Today](#), March 16, 2011

ISHINOMAKI, Japan — Battered but unbowed, the Statue of Liberty still stands tall on a small island in the Kitakami River. Little else does.

The mock statue was once a premier tourist attraction here in this port city in northeastern Japan. Now she raises her torch over a sea of devastation left by the monster tsunami that washed away whole villages and thousands of people.

Beside the statue is a wrecked senior care facility. The facility came from more than a mile away, swept here when the tsunami struck five days ago. No one has seen the people who lived in it.

"Most of the dead will be elderly," Vice Mayor Etsuro Kitamura said Tuesday.

About 10,000 people in this city of 160,000 are believed dead, Kitamura said. Thousands are missing elsewhere too, though it is not known how many disappeared into the sea or fled to stay elsewhere.

Fumiaki Sato believes his 75-year-old mother is alive.

"I still have hope," he said outside the rice wine store he manages, which was lying sideways on the riverbank.

When the magnitude-9.0 quake shook the area and tsunami alerts blared from sirens, Sato loaded his mother into his pickup to escape. Then the wall of water rushed in.

"I was climbing in when it hit," said Sato, 46. "I was washed away, and when underwater, I saw a huge boat pass over my head."

Sato made it out of the roiling water in only his underpants. He has spent the past five days joining millions of others in a daily search for shelter, food, water, fuel and missing relatives.

The island where Sato's mother disappeared is famous for Japan's popular manga comics. It's also known for the spaceship-style museum, a rare tsunami survivor, that celebrates local manga artist Shotaro Ishinomori. In the 1960s, Ishinomori created the still highly popular series Cyborg 009 and Kamen Rider, the Japanese comic versions of Batman and Spiderman.

Sato and 18 others took refuge there for the past four freezing and powerless nights. The town, a sister city with the port of Everett, Wash., needs such superheroes today, said museum employee Seitaro Omori.

In shattered streets, where fishing boats lie atop crushed cars, statues of well-known manga characters still strike dramatic poses amid the rubble. In one bizarre scene, a manga warrior stands next to a car lifted on top of a piano from an adjacent Yamaha store.

"I wish he could come to life," said Omori, 34, of the special hero Ishinomori created for this town. "Somebody like that is really needed to help people recover mentally from this shock."

Instead of fictional saviors, Ishinomaki relies on a sense of public spirit, order and responsibility.

"When disasters happen in foreign countries, I've seen pictures of people looting stores," said Hidenori Takashi, a Tokyo food company employee who reached Ishinomaki on Monday and found his family safe. "Here, even at crowded shelters, people are cooperating, keeping calm and maintaining social order."

"That's our national character — respect for each other, helping each other and obeying the laws," he said.

Such stoicism extends to his daughter Miku, a dentist's nurse, who clutched the family cat as they climbed through a series of boats — washed on top of a battered bridge — to stay in a relative's house.

She and her mother watched the tsunami from an upstairs window.

"I saw more than 20 people being washed away in the river, with some of them on top of their cars. Everyone was screaming," said Miku, 20.

Takashi says that unless the government can guarantee the food supply, public order may deteriorate and crime may surge.

Hiroko Kodo, a mother of four, is struggling to keep her family sated with the meager shelter rations, in near-freezing conditions.

"We're cold and hungry. My concern now is how much longer we can last without our lifeline" — food and water, Kodo said. And now she has another worry, after receiving a free Red Cross medical bag Monday that included a radio.

"There is water in the mountains, but we're afraid to drink it because of what happened in Fukushima," where a nuclear power plant has leaked radiation.

"Water, food and fuel are a problem," said Hideo Amagai, a first lieutenant in Japan's Self-Defense Forces who assisted those camping out in the manga museum to move to a shelter Tuesday.

"We've got more than most people but even for us it is very limited," said Amagai, who said he was impressed by the attitude of local residents.

"They are very calm, there's no sense of panic," he said. "Instead of crying 'help,' they say, 'would you mind helping us?'"

In the beleaguered town, where almost 40,000 evacuees take refuge, food is scarce, just one rice ball a day, but not the social discipline and courtesies of regular Japanese life. City Hall has transformed into a processing zone for survivors, who pore quietly, and often sadly, over regular registration updates from the 106 separate emergency shelters citywide.

In a neat square of padded mats, just accommodating four petite seniors, with shoes neatly parked outside, Toshiko Suzuki, 70, prepared Tuesday to spend a fifth night at the makeshift shelter on several upper floors of city hall, where kerosene generators provide rare light in an otherwise blacked-out city.

"It's very good here," Suzuki said. "The city workers have given up their sleep and food to help us. They have their own worries, but can't go home."

She is desperate for word from her granddaughter, Sae Suzuki, 15, who graduated from junior high school on the morning of the tsunami.

"She's a very athletic girl, good at basketball, track and field and karaoke," said her worried grandmother. "She went out to play with some classmates — and that was the last we saw of her."

Tazuko Endo, 70, hunts for word from her missing husband and son.

"It's been five days now. If they are safe, why couldn't they just walk home?" she wondered at the City Hall shelter.

While most praise the public response, tempers are beginning to fray at the continuing shortages and deprivations, in Asia's richest country.

"People are slowly getting frustrated and stressed out. At night, some people shout and argue, and complain to the city workers," Suzuki said. Kitamura, the vice mayor, estimates just 5% of evacuees do not "follow the rules and etiquette," he said. But he has far weightier worries.

The town crematorium can handle nine corpses a day, or 18 at the very most, Kitamura said. At that rate, staff could be busy for the next 500 days.

Instead, he must resort to burial, highly unusual in Japan, and ask other cities to assist with cremating the dead.

He also clings to optimism. "We will recover. We are determined."

Death Toll Rises, Stocks Plunge, Foreigners Flee As Nuclear Crisis Escalates (WP)

By Chico Harlan

[Washington Post](#), March 16, 2011

TOKYO — With Japan in the throes of a three-pronged disaster, foreigners began fleeing the country in larger numbers Tuesday, as millions of people endured another frigid night with little food, water or heat.

The Chinese government announced it was organizing an evacuation of its citizens from northeastern Japan, which has been ravaged by a 9.0 magnitude earthquake — elevated from 8.9 — and a devastating tsunami, followed by a mounting nuclear disaster at a major power station 150 miles north of Tokyo.

The United States urged Americans to avoid travel to Japan, Austria moved its embassy from Tokyo to Osaka, and Lufthansa diverted its two daily Tokyo-bound flights to other Japanese cities, the Associated Press reported.

Rescue teams have found little but unrelenting devastation and misery in coastal towns struck by the tsunami, which in some places produced waves more than 30 feet high. Residents looked for possessions Tuesday amid the ruins of the coastal city of Ofunato, where whole blocks lay flattened and a yacht had come to rest atop a two-story gas station, AP reported. In a rare piece of good news, the agency said, rescuers found two survivors Tuesday, including a 70-year-old woman whose house was torn off its foundation by the tsunami.

As temperatures dipped near freezing at night, more than 850,000 households remained without power in the northeast, and at least 1.5 million homes had no running water.

To make matters worse, Japan continued to be struck by dozens of aftershocks, including three of 6.0 magnitude or greater. The strongest, a 6.2 temblor, shook buildings in Tokyo late Tuesday but caused no damage.

Torn up and terrified by a disaster that keeps getting worse, Japan has transformed in just four days from one of the world's most comfortable countries into one of its most distressed.

Amid an escalating nuclear emergency, a dangerous plume of radioactive material leaked Tuesday from the Fukushima Daiichi nuclear power plant, causing panic among stock traders, triggering evacuation orders from foreign companies and generating a deep sense of unease among millions of residents concerned about radiation exposure.

The related disasters caused other complications. Radiation leakage prompted mass evacuations and a no-fly zone covering a 19-mile radius around the facility. Malfunctioning nuclear plants have left the country with an energy shortage, leading to power cuts even at some refugee shelters even as the weather turned colder. The stock market plunged more than 10 percent.

Along the coast, 6,000 are officially confirmed as either dead or missing, according to the police tally. Many more are unaccounted for. Officials in one prefecture estimate that at least 10,000 of its 2.3 million citizens were killed by the tsunami and quake.

Hospitals, short of medicine and supplies, are struggling to treat seriously injured or ill patients, news agencies said, and overwhelmed local officials have not been able to secure enough space for morgues and coffins. The continuing blackout has made it impossible to create dry ice to pack the bodies.

More than 500,000 people have been evacuated from the hardest-hit areas and 15,000 have been rescued, including a 70-year-old woman pulled from her toppled home by rescuers on Tuesday. But time is running out for rescuers to help those still stranded by flooding or trapped in debris.

In the north, a cold front was moving in, leading to a drop in temperatures and snow in some areas.

Officials said about 2,000 bodies were found Monday along the coast of battered Miyagi Prefecture, and a survey of local governments conducted by the Kyodo News agency found that about 30,000 people in the devastated areas remain unaccounted for.

Those who survived now spend much of their time watching public broadcaster NHK, following frightening news about the explosions and fires at the Fukushima Daiichi nuclear power plant.

After a 6:14 a.m. explosion at the Unit 2 reactor Tuesday (5:14 p.m. Monday in Washington), Prime Minister Naoto Kan — wearing a durable blue work jacket — addressed the nation.

"Please listen to my message calmly," he said, before explaining that that radiation had spread from malfunctioning reactors at Fukushima Daiichi into the environment.

Readings in the nearby area suggested very high risk, he said, although within nine hours of the blast they had dropped to lower — but still elevated — levels.

"The radiation level has risen substantially," Kan said. "The risk that radiation will leak from now on has risen."

The government told those within 12.5 miles of the plant to evacuate. It asked those within 19 miles to stay indoors. Those outside of that radius — including the 13 million in Tokyo, 150 miles to the south — wondered whether to trust what little information they received from the government, whose top spokesman said those in the capital would be safe.

Snaking lines formed at Tokyo's Narita and Haneda international airports as foreigners packed the ticket counters, hoping to catch a flight far away from Japan and the lingering threat of radiation poisoning.

Many came to the airport hours or days before their scheduled flights were to leave, hoping for an earlier departure, even though they had already been told several times no earlier flights were available.

"Anywhere but here," said Maria Sumner, a 23-year-old from Washington, Mo., who was headed to San Francisco on Tuesday after a deluge of worried e-mails from family and friends. "It just got to be a little too much," she said.

Meanwhile, the Nikkei 225 recorded one of its largest-ever drops, closing at 8605.15 — down 10.55 percent. Coupled with Monday's 6.2 percent drop, the index has plummeted nearly 17 points in the first two business days since the catastrophe.

Many of the losses were due to a rapid sell-off that occurred right as Kan warned about the radiation risks.

At an earlier news conference Tuesday, four officials from Tokyo Electric Power Co., which operates the nuclear plant, offered almost no information about the damage that occurred during the explosion or the implications.

"What has happened in the stock market reflects the amount of uncertainty — the different rumors that are floating around," said Edwin Memer, a 30-year resident of Tokyo and president of the Atlantic Investment Research Corp. "A certain panic thinking that is going on. I think the main thing is, people just don't know. And they don't necessarily trust the information they have been hearing."

Exodus From Tokyo Begins (WT)

Nuclear radiation fears driving many to flee city

By Christopher Johnson

Washington Times, March 16, 2011

SHIZUOKA, Japan | A quiet exodus from Tokyo began on Tuesday after another explosion and a fire at a nuclear-power plant in Fukushima sent radiation levels above normal in the capital and in other prefectures in the north and east of Japan.

Many fleeing Tokyo residents said they could no longer tolerate tremors jolting them out of bed, four days after the strongest earthquake to hit Japan in recorded history struck Friday, followed by a raging tsunami that may have claimed as many as 10,000 lives.

Many feared that a cloud of nuclear radiation could drift from the plant 170 miles northeast of the capital toward the Kanto Plain, home to about 30 million people in a vast metropolis including Tokyo and Yokohama.

The Tokyo metropolitan government said radiation levels surged to 23 times the normal level Tuesday in the capital.

"The possibility of further radioactive leakage is heightening," Prime Minister Naoto Kan said in a TV address Tuesday morning. "We are making every effort to prevent the leak from spreading. I know that people are very worried, but I would like to ask you to act calmly."

He said radiation spread from the four battered nuclear reactors of the Dai-ichi power plant in Fukushima prefecture, after an explosion in Unit 2 and a fire in Unit 4 on Tuesday.

The fire in a fuel-storage pond, where nuclear rods are cooled, sent radioactive gases into the air. Two workers were missing after the Tuesday blast.

"Radioactivity is being released directly into the atmosphere," a Japanese official told the International Atomic Energy Agency.

Early Wednesday, another fire broke out at the Dai-ichi Unit 4, according to a spokesman for Tokyo Electric Power Co., elaborating that the new fire was the result of the earlier fire not having been completely extinguished.

Japan's Nuclear and Industrial Safety Agency said later Wednesday morning that the flames had been put out, though smoke was still visible on Japanese TV and video feeds.

Hydrogen explosions caused by releasing pressure to prevent a nuclear meltdown hit Unit 1 on Saturday and Unit 3 on Monday.

The Tokyo Electric Power Co., the owner of the nuclear plant, said it could not rule out a meltdown, which would release radioactive material into snowstorms forecast for northern Japan. The company pulled out 750 workers, leaving just 50, and the government imposed a no-fly zone around the reactors.

More US military crews on rescue missions were exposed to low-levels of radiation and decontaminated. The USS Reagan aircraft carrier strike group, which includes seven other ships, flew 29 missions Tuesday to deliver 17 tons of food and supplies.

The Russian Embassy in Tokyo said it is expecting a worst-case scenario of radioactive leakage. Joining several European embassies in advising citizens to leave the capital region, China said it will fly home Chinese from devastated areas, while the Indonesian government said it flew home 99 of its citizens living in the hard-hit Miyagi prefecture.

In Tokyo, increasing numbers of Japanese left the city, but there was no panicky mass exodus.

"I need to make money, but life is more important," said Kenichi Okajima, a Tokyo office worker.

He said he decided to leave work after seeing the latest explosion and the weather report that the winds from north to south could potentially blow radioactive materials to Tokyo.

He said he planned to take his family to the mountains of Toyama, west of the capital.

"We have small children, and we don't want to take any chances about them getting radiation sickness," he said.

A Shinkansen bullet train speeding west from Tokyo was packed on Tuesday afternoon with mothers and children fleeing the city to hotels or homes of relatives across Japan while their husbands continued to work in Tokyo.

Yuichiro Sakata, a student in Tokyo, said his parents in central Japan called him after they saw the TV reports of the third explosion Tuesday morning. He didn't want to leave.

"They said to me, 'Hurry up. You must come home right now.'"

Heeding warnings from the embassies of France, Germany, China and other countries, many foreigners boarded trains and headed for airports across Japan because of "superlong lines" at Narita International Airport outside Tokyo, as one city resident said on Twitter.

While some foreigners vowed to stay in Tokyo and ride out the wave of fear, many foreigners with Japanese spouses and children opted to leave the city to save their children from the risk of thyroid cancer from overexposure to radiation.

Fred Varcoe, a professor and writer who lives with his Korean wife and daughter on the Chiba coast east of Tokyo, drove to escape to a hotel in Shimizu, near the Mount Fuji volcano about 60 miles west of Tokyo.

He said he was lucky to find an open gas station, amid reports of fuel shortages across the Tokyo area and the devastated prefectures of northern Honshu island.

South from Fukushima, radiation measured at 100 times the normal level in Ibaraki, a prefecture bordering Tokyo, Kyodo News reported, citing Japanese officials. About eight hours after the explosions, the U.N. weather agency said winds were blowing particles over the Pacific Ocean.

Fukushima Nuke Plant Situation 'Worsened Considerably': Think Tank (KYODON)

[Kyodo News](#), March 16, 2011

The situation at the quake-hit Fukushima No. 1 nuclear plant in northeastern Japan "has worsened considerably," the Institute for Science and International Security said in a statement released Tuesday.

Referring to fresh explosions that occurred earlier in the day at the site and problems in a pool storing spent nuclear fuel rods, the Washington-based think tank said, "This accident can no longer be viewed as a level 4 on the International Nuclear and Radiological Events scale that ranks events from 1 to 7."

Noting that a level 4 incident involves "only local radiological consequences," it said the ongoing crisis is "now closer to a level 6, and it may unfortunately reach a level 7" — a worst case scenario with extensive health and environmental consequences.

"The international community should increase assistance to Japan to both contain the emergency at the reactors and to address the wider contamination. We need to find a solution together," it said.

==Kyodo

Experts Had Long Criticized Potential Weakness In Design Of Stricken Reactor (NYT)

By Tom Zeller Jr.

[New York Times](#), March 16, 2011

The warnings were stark and issued repeatedly as far back as 1972: If the cooling systems ever failed at a "Mark 1" nuclear reactor, the primary containment vessel surrounding the reactor would probably burst as the fuel rods inside overheated. Dangerous radiation would spew into the environment.

Now, with one Mark 1 containment vessel damaged at the embattled Fukushima Daiichi nuclear plant and other vessels there under severe strain, the weaknesses of the design — developed in the 1960s by General Electric — could be contributing to the unfolding catastrophe.

When the ability to cool a reactor is compromised, the containment vessel is the last line of defense. Typically made of steel and concrete, it is designed to prevent — for a time — melting fuel rods from spewing radiation into the environment if cooling efforts completely fail.

In some reactors, known as pressurized water reactors, the system is sealed inside a thick steel-and-cement tomb. Most nuclear reactors around the world are of this type.

But the type of containment vessel and pressure suppression system used in the failing reactors at Japan's Fukushima Daiichi plant is physically less robust, and it has long been thought to be more susceptible to failure in an emergency than competing designs. In the United States, 23 reactors at 16 locations use the Mark 1 design, including the Oyster Creek plant in central New Jersey, the Dresden plant near Chicago and the Monticello plant near Minneapolis.

G.E. began making the Mark 1 boiling-water reactors in the 1960s, marketing them as cheaper and easier to build — in part because they used a comparatively smaller and less expensive containment structure.

American regulators began identifying weaknesses very early on.

In 1972, Stephen H. Hanauer, then a safety official with the Atomic Energy Commission, recommended that the Mark 1 system be discontinued because it presented unacceptable safety risks. Among the concerns cited was the smaller containment design, which was more susceptible to explosion and rupture from a buildup in hydrogen — a situation that may have unfolded at the Fukushima Daiichi plant. Later that same year, Joseph Hendrie, who would later become chairman of the Nuclear Regulatory Commission, a successor agency to the atomic commission, said the idea of a ban on such systems was attractive. But the technology had been so widely accepted by the industry and regulatory officials, he said, that "reversal of this hallowed policy, particularly at this time, could well be the end of nuclear power."

In an e-mail on Tuesday, David Lochbaum, director of the Nuclear Safety Program at the Union for Concerned Scientists, said those words seemed ironic now, given the potential global ripples from the Japanese accident.

"Not banning them might be the end of nuclear power," said Mr. Lochbaum, a nuclear engineer who spent 17 years working in nuclear facilities, including three that used the G.E. design.

Questions about the design escalated in the mid-1980s, when Harold Denton, an official with the Nuclear Regulatory Commission, asserted that Mark 1 reactors had a 90 percent probability of bursting should the fuel rods overheat and melt in an accident.

Industry officials disputed that assessment, saying the chance of failure was only about 10 percent.

Michael Tetuan, a spokesman for G.E.'s water and power division, staunchly defended the technology this week, calling it "the industry's workhorse with a proven track record of safety and reliability for more than 40 years."

Mr. Tetuan said there are currently 32 Mark 1 boiling-water reactors operating safely around the globe. "There has never been a breach of a Mark 1 containment system," he said.

Several utilities and plant operators also threatened to sue G.E. in the late 1980s after the disclosure of internal company documents dating back to 1975 that suggested that the containment vessel designs were either insufficiently tested or had flaws that could compromise safety.

The Mark 1 reactors in the United States have undergone a variety of modifications since the initial concerns were raised. Among these, according to Mr. Lochbaum, were changes to the torus — a water-filled vessel encircling the primary containment vessel that is used to reduce pressure in the reactor. In early iterations, steam rushing from the primary vessel into the torus under high pressure could cause the vessel to jump off the floor.

In the late 1980s, all Mark 1 reactors in the United States were also retrofitted with venting systems to help reduce pressure in an overheating situation.

It is not clear precisely what modifications were made to the Japanese boiling-water reactors now failing, but James Klapproth, the chief nuclear engineer for General Electric Hitachi, said a venting system was in place at the Fukushima plants to help relieve pressure.

The specific role of the G.E. design in the Fukushima crisis is likely to be a matter of debate, and it is possible that any reactor design could succumb to the one-two punch of an earthquake and tsunami like those that occurred last week in Japan.

Although G.E.'s liability would seem limited in Japan — largely because the regulatory system in that country places most liability on the plant operator — the company's stock fell 31 cents to \$19.61 in trading Tuesday.

More US Relief Crews Exposed To Radiation In Japan (AP)

Associated Press, March 16, 2011

WASHINGTON — More US military crews were exposed to radiation Tuesday as the Pentagon ramped up relief flights over a Japan reeling from an earthquake, tsunami and nuclear crisis.

The Defense Department said the Navy started giving anti-radiation pills to some of those exposed, and Americans on two military bases south of Tokyo were advised to stay indoors as much as possible. Meanwhile, US aviation and energy officials also worked with Japanese counterparts on the nuclear developments.

With more aid for victims on the way, the US Navy said it was redirecting three ships to work in the Sea of Japan on the country's west coast rather than risk the hazards of radiation and the debris field in the waters off the east coast.

Sensitive air monitoring equipment on the aircraft carrier USS George Washington detected low levels of radioactivity from the Fukushima Dai-ichi nuclear power plant as the carrier sat pier-side at Yokosuka, Cmdr. Jeff Davis, a spokesman for the US 7th Fleet, said Tuesday.

Davis said that while there was no danger to the public from the radiation levels, the commander recommended as a precaution that military personnel and their families at the two bases, Yokosuka and Naval Air Facility Atsugi, limit their outdoor activities and seal ventilation systems at their homes as much as possible.

At the White House Tuesday, spokesman Jay Carney said that unlike some other countries the US was not recommending that American citizens leave Tokyo over radiation concerns. Tokyo is about 170 miles from the nuclear plant and slightly elevated radiation levels were reported in the capital, but Japanese officials said the increase was too small to threaten the 39 million people in and around the city.

Nonetheless, Austria said it is moving its embassy from Tokyo to Osaka and France recommended that its citizens leave the Japanese capital.

Carney said that US officials have determined American citizens in Japan should follow the same guidance Japan is giving to its own citizens. The Japanese government has warned people within 20 miles of the nuclear reactor complex damaged in the earthquake and tsunami to stay indoors to avoid exposure, but officials have said radiation levels in Tokyo didn't represent a threat.

The US embassy in Tokyo has told Americans to avoid traveling to Japan.

The Navy said Monday that radiation was detected by another carrier, the USS Ronald Reagan, and that 17 helicopter crew members had to be decontaminated after returning to the Reagan from search and rescue duty. The Navy said more crews were exposed to very low levels of radiation Tuesday and had to be decontaminated.

Potassium iodide pills were given to a small number of those crew members as a precaution, said Col. Dave Lapan, a Defense Department spokesman.

The Reagan strike group — which includes seven other ships — flew 29 missions Tuesday to deliver 17 tons of food, water, blankets and other relief supplies ashore.

"We continue to monitor the winds closely, moving our ships and aircraft as necessary to avoid the wind line from the Fukushima power plant," Davis said. "Our aircraft and aircrews returning from missions ashore are being monitored carefully for contamination, and we are conducting decontamination procedures as necessary when it is detected."

A three-ship amphibious group, including the 31st Marine Expeditionary Unit aboard the USS Essex, was directed to position itself in the Sea of Japan and was to arrive Thursday for other relief duties.

Meanwhile, Energy Secretary Steven Chu said his department has assembled a team of 34 people and sent 7,200 pounds of equipment to Japan to help monitor and assess the situation with the nuclear reactors.

Carney said Tuesday that President Barack Obama has asked US nuclear regulators to incorporate information and lessons learned from the Japan incident into its overall reviews of the safety and security of reactors in the US.

And the Federal Aviation Administration said the United States is working closely with Japan to ensure that problems associated with a stricken nuclear power plant do not jeopardize air travel safety. Spokeswoman Laura Brown said the Japanese civil aviation authority "has established flight restrictions keeping civil aviation flights away from the Fukushima facility" and said US airlines have indicated they are complying with the new rules.

"There is no credible information available at this point indicating the need for further restrictions," Brown said in a statement Tuesday, adding that if the situation worsens the FAA is prepared reroute air traffic or take other measures.

US Military Steps Up Quake Relief Efforts (WSJ)

By Nathan Hodge

[Wall Street Journal](#), March 16, 2011

Full-text stories from the Wall Street Journal are available to Journal subscribers by clicking the link.

More US Relief Crews Exposed To Radiation In Japan (AP)

[Associated Press](#), March 15, 2011

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Chu: Energy Dept. In 'Close Contact' With Japan On Nuclear Crisis (HILL)

By Ben Geman

[The Hill](#), March 16, 2011

Energy Secretary Steven Chu told a House panel Tuesday the department is deploying over 30 people to Japan to address the nuclear reactor crisis.

Chu, appearing before the House Appropriations Committee panel that sets Energy Department spending, said DOE and Nuclear Regulatory Commission (NRC) officials are in "close contact" with Japanese officials.

Officials sent to Japan include a nuclear engineer who speaks Japanese and an emergency response representative deployed as part of the US Agency for International Development Disaster Assistance Response Team, Chu said.

"We are positioning Consequence Management Response Teams at US consulates and military installations in Japan. These teams have the skills, expertise and equipment to help assess, survey, monitor and sample areas. They include smaller groups that could be sent out to gather technical information in the area," Chu said.

"We have sent our Aerial Measuring System capability, including detectors and analytical equipment used to provide assessments of contamination on the ground," he added about the effort, which includes 34 people.

Chu reiterated White House comments in recent days that the administration plans to learn from the Japanese crisis but remains committed to nuclear power as a key piece of meeting the nation's energy needs.

"The American people should have full confidence that the United States has rigorous safety regulations in place to ensure that our nuclear power is generated safely and responsibly. Information is still coming in about the events unfolding in Japan, but the administration is committed to learning from Japan's experience as we work to continue to strengthen America's nuclear industry," Chu said.

Chu noted that US officials have long considered the potential for events such as earthquakes and tsunamis.

He reiterated the administration's request to add \$36 billion to DOE's loan guarantee authority to help the industry finance development of the first new US reactors in decades. The administration has made one commitment thus far, last year pledging an \$8.3 billion guarantee to Southern Co. for two planned reactors in Georgia. But that project still must gain NRC approval to go forward.

"Nuclear energy ... has an important role to play in our energy portfolio," Chu said, noting that the administration "believes we must rely on a diverse set of energy sources, including renewables like wind and solar, natural gas, clean coal and nuclear power."

Radiation Monitoring Equipment In Japan Shortly: Chu (REU)

[Reuters](#), March 16, 2011

Full-text stories from Reuters currently cannot be included in this document. You may, however, click the link above to access the story.

As Japan Crisis Unfolds, Energy Secretary Steven Chu Fails Nuclear And Leadership Test (FOX)

By Iain Murray

[FOX News](#), March 16, 2011

With reactors at the Fukushima Daiichi nuclear plant in danger of a meltdown, the world waits with bated breath for the outcome. Interestingly, physicists, the people who typically know the most about nuclear reactions, appear to be less concerned than the general public. This should be a time for the country's most important physicist, Energy Secretary Steven Chu, to step up to the plate and explain to Americans why he is not worried. Instead, the Secretary is missing in action.

At first glance, the events at Fukushima seem like a perfect illustration of Murphy's Law – "If something can go wrong, it will." First the plant was hit by an earthquake seven times stronger than it was designed to withstand, but withstand it did. Control rods were immediately lowered into the core and the chain reaction stopped. Backup power kicked in.

Then a massive tsunami hit the plant, reportedly demolishing several key installations and knocking out the backup power. The plant continued to run on emergency power.

When the emergency power ran out, the backup emergency power didn't work (due to backup facilities using the wrong plugs, according to some reports). Hydrogen buildup from the rapidly heating core caused explosions in the shell (which is designed to keep the elements out, not radiation in). Attempts to cool the reactor with seawater started too late, leading to the fuel rods being exposed rather than covered in coolant.

Fortunately, even Murphy's Law has its exceptions. Despite all these problems, the reactor – at this writing – was damaged but not yet in meltdown. No one had been exposed to dangerous amounts of radiation and no dangerous material had been released into the surrounding environment. In other words, despite virtually everything going wrong in unforeseeable ways, the reactor has as yet caused no wider harm to people.

Yet you wouldn't know that from the loud calls by politicians and environmental advocacy groups for the United States to abandon nuclear power, claiming it is inherently dangerous.

The Obama administration, to its credit, disagrees. Its proposed energy plan relies on the building of 100 new nuclear reactors in the near to medium term, to allow us to replace coal as America's main generator of electricity. During Monday's White House press briefing, spokesmen from the Department of Energy and the Nuclear Regulatory Commission told reporters that the events in Japan gave no reason to abandon this plan.

Such statements from middle-rank officials are likely to be ignored, and could thus hobble the president's own energy policy. Yet sitting near President Obama around the Cabinet table is our energy secretary who just also happens to be a Nobel-prize winning physicist. Steven Chu has both the authority and the credibility to put paid to scaremongering and refocus America's energy debate to where it should be: the price of oil.

So far, however, Secretary Chu has shown no willingness to tackle public fears regarding the crisis in Japan, beyond a few words of boilerplate at a House hearing on the Energy Department budget on Tuesday morning. One would assume that the White House would want Dr. Chu to be actively making the case for its energy policy—unless they think that the Secretary is simply not up to the job.

This is especially unfortunate when major environmental advocacy groups (including some with whom Secretary Chu has associated) have exploited the Japanese disaster for political advantage.

Sadly, America's news organizations have taken their bait, by shifting their focus away from the massive devastation and thousands of dead and concentrating instead on something that has yet to kill anyone. I wouldn't be surprised if Greenpeace's donations have gone up—perhaps at the expense of the Red Cross.

Steven Chu is uniquely placed to shift the nation's attention to where it needs to be. The fact that he has not done so exhibits a massive failure of leadership.

Iain Murray is a Vice President at the Competitive Enterprise Institute.

Japan Disaster Another Worry For Global Economy (AP)

By Erika Kinetz, AP Business Writer

Associated Press, March 16, 2011

Japan's earthquake and nuclear crisis have put pressure on the already fragile global economy, squeezed supplies of goods from computer chips to auto parts and raised fears of higher interest rates.

The disaster frightened financial markets in Tokyo and on Wall Street on Tuesday. Japan's Nikkei average lost 10 percent, and the Dow Jones industrials fell so quickly after the opening bell that the stock exchange invoked a special rule to reduce volatility.

Yet the damage to the US and world economies is expected to be relatively moderate and short-lived. Oil prices are falling, helping drivers around the world. And the reconstruction expected along Japan's northeastern coast could even provide a jolt of economic growth.

A weaker Japanese economy could help ease global commodity prices because Japan is a major importer of fuel, agricultural products and other raw materials, notes Mark Zandi, chief economist at Moody's Analytics. Oil prices fell more than \$4 to \$97.18 a barrel Tuesday because of expectations that quake damage will slow Japan's economy and reduce its demand for energy.

Even "assuming a drastic scenario," Bank of America economist Ethan Harris estimates, the disaster would shave just 0.1 percentage point off global economic growth — to 4.2 percent this year.

"Japan has not been an engine of global or Asian growth for some time," says Nariman Behraves, chief economist at IHS Global Insight. "This means that the impact of much lower Japanese growth on the world economy will be probably limited and small."

Japan is only half as important to the world's economy as it was during its last major disaster, the 1995 Kobe earthquake. And the area hit hardest by Friday's quake accounts only about half as much economic output as the area damaged by the Kobe quake, the Organization for Economic Cooperation and Development estimates.

Japan proved resilient after the Kobe quake: Manufacturers returned to normal production levels within 15 months, according to the CLSA. Four in every five shops were back open in a year and a half. All told, Japan's comeback defied dire warnings that it would take a decade to rebuild.

Autos and auto parts make up more than one-third of US imports from Japan. As a result, shutdowns of Japanese auto factories could disrupt production at US plants owned by Japanese automakers.

At the same time, some US auto parts makers could benefit if Japanese plants in the United States substitute US parts for those they usually get from Japan, Behraves says.

A big wild card is the fate of Japan's damaged nuclear power plants. The Fukushima Dai-ichi plant, the center of the concern, let off a burst of radiation on Tuesday. Radiation levels in the surrounding area subsided by evening, but unease in Japan did not.

"If the nuclear crisis turns into a full-blown catastrophe, then the negative effect on growth this year will be much larger," IHS' Behraves says.

Another unknown is the impact of the disruptions to Japan's power supplies. Behraves estimates about 10 percent of Japan's electricity generation could be off line for several months. If so, that would disrupt steel, auto and other production.

Investors fear that Japan will struggle to finance reconstruction, which is expected to cost the government at least \$200 billion. The Japanese government's debt is already an alarming 225 percent of the country's economic output.

Some worry that Japan will sell some of its vast holdings of US government debt to raise money. Doing so would push the prices of US Treasury bonds down and yields up, raising US interest rates.

But Treasury Secretary Timothy Geithner on Tuesday dismissed the fears of a Japanese fire sale of Treasury debt.

"Japan is a very rich country and has a high savings rate," he said. It "has the capacity to deal not just with the humanitarian challenge but also the reconstruction challenge they face ahead."

What's more, the Bank of Japan has been buying Treasuries and other assets as it pumps money into the financial system to restore calm.

For now, though, the latest quake, the resulting tsunami and the threat of contamination from a damaged nuclear plant have spooked financial markets. Investors are fretting about the effects on companies around the world. Japan, the world's third-largest economy, accounts for about 10 percent of US exports.

The Dow Jones industrials rebounded after starting the day down almost 300 points. They closed down 137 points, or more than 1 percent. The futures markets, which can indicate whether stocks will rise and fall, looked so pessimistic before the opening bell on Wall Street that the stock exchange invoked a special rule designed to ease volatility.

Stocks plunged 5 percent in Germany and 4 percent in France. And in Japan, the benchmark Nikkei average lost more than 10 percent of its value in a matter of hours.

The quake damaged roads, ports, airports and factories in Japan, disrupting the shipment of goods in and out. The disaster blindsided multinational companies that were bracing for trouble in their transportation lines on the other side of the world — at the Suez Canal or elsewhere in the Middle East where protests are destabilizing countries from Bahrain to Libya, says Patrick Burnson, executive editor of Supply Chain Management Review.

It's shut down auto and auto parts factories. Analysts at Tong Yang Securities in South Korea "do not expect production to normalize any time soon" in Japan. Even plants that stay open may have to wait for parts to arrive, a problem made worse because so many factories follow just-in-time supply management and keep few parts on hand.

Car plants in Thailand could have a harder time getting steel, much of which is imported from Japan.

Japan is a major supplier of NAND flash memory chips, commonly used in portable electronics. Japan-based Toshiba Corp., a big maker of the chips, was among the technology companies that temporarily closed facilities.

Prices for the chips jumped 10 percent from before the earthquake to Monday and another 3 percent Tuesday, according to Jim Handy, a director at Objective Analysis and an expert on the electronics and semiconductor industries.

The "wafers" that are key building blocks of computer chips are also commonly made in Japan. A shortage could pinch big buyers such as Intel Corp., the world's biggest semiconductor company, and Texas Instruments Inc. — though one firm, Barclays Capital, believes Texas Instruments has enough in stock to get by. Supplies are lean, though, of capacitors and other electronics used in cellphones, which are also often made in Japan. Nokia Corp. relies heavily on Japan for those electronics.

Chinese companies are bracing themselves for losses and delays from disruptions in shipments of high-end electronics and auto components from Japan and some are looking for import replacements from South Korea or Taiwan, according to the International Business Daily, the official paper of China's Commerce Ministry.

Some analysts note that companies and consumers that now buy Japanese products can often find alternatives made elsewhere.

"What is made in Japan now has lots of competitive alternatives that didn't exist 25 years ago," says Peter Morici, a professor at the University of Maryland and a former director at the US International Trade Commission. "If there aren't as many Camrys in the country this year as there might have been, you might have a couple hundred thousand additional Ford customers. If those people have good experiences with those cars, it could change buying patterns for life."

David Rea, an economist with Capital Economics in London, said, "You'll have Japan's competitors — largely South Korea and Taiwan who are in high end manufacturing, and China as well — come in and undercut Japanese businesses experiencing disruption from the earthquake."

If Japan's infrastructure doesn't get rebuilt quickly enough, Japanese companies may transfer production overseas to pick up the slack, Rea added.

The reconstruction of Japan's northeastern coast might also provide business opportunities for foreign countries. Malaysian timber, for instance, will likely be needed to rebuild homes and other buildings. IHS predicts that the quake will "ultimately boost" US exports to Japan.

Japan's Disruption Throws A Wrench Into World's Economic Gears (MCT)

By Kevin G. Hall

[McClatchy](#), March 16, 2011

WASHINGTON — The disaster unfolding in Japan provided a stark reminder Tuesday of how interconnected the global economy has become, with the price of stocks and commodities skidding everywhere as investors weighed how long one of the world's economic engines will be sputtering.

Investors fretted over how deep the damage is to manufacturing of automotive and telecommunications equipment in Japan, the world's third-largest economy and America's fourth-biggest trade partner.

Japanese manufacturing is deeply integrated into the US and Chinese economies — the world's two largest — so there's ample reason for worry. How quickly Japan recovers will affect everyone from Australian coal miners who export to Japan, to Chinese manufacturers who assemble parts made in Japan, to US dock workers who handle freight from both China and Japan.

Most experts think Japan's production problems will be short-lived, but not without economic dislocations felt around the globe.

"Natural disasters tend to cause short-term displacements that tend to reverse," said Martin Regalia, chief economist for the influential US Chamber of Commerce. "At some point, we're going to be selling into the Japanese economy equipment and products and resources to get them going again, and that will be positive for those sectors of the US economy that do that."

The prospects of rolling power outages and damage to the Japanese power grid were a main concern globally Tuesday, as investors tried to measure how global trade in oil, natural gas and coal will be affected by the deepening problems in Japan.

Concern about Japan sent the Dow Jones Industrial Average down 296 points initially after Tuesday's opening. Buoyed later by a positive statement from the Federal Reserve, US stocks recovered partially from their initial plunge to send the Dow to a more modest drop of 137.74 points to 11,855.42.

Japan's Nikkei index skidded to close down almost 10.6 percent, a massive drop. Taken with losses on Monday, Japanese stocks have lost almost a fifth of their value since last Friday's earthquake, tsunami and subsequent crisis at several nuclear reactors.

This global financial turbulence affects ordinary Americans in ways they might not even know. Many US mutual funds have significant percentages of their assets invested in Japan. The nation's largest retirement-fund investor, Fidelity Investments, has its Japan Fund invested almost completely in Japan, as well as a Pacific Basin fund with more than one-third of its assets tied up in Japan. Similarly, investment giant Vanguard has a Pacific Stock Index fund with holdings in Japanese companies such as Toyota and Mitsubishi.

In one welcome economic ripple from Japan, the global price of benchmark West Texas Intermediate crude oil for April delivery settled down \$4.01 at \$97.18 on the New York Mercantile Exchange, as Japan's post-quake drop in demand outweighed fears of unrest in the Middle East.

The price of other commodities ranging from copper and lumber to coffee and sugar also fell on concerns that at least for the next month, there'll be a sharp drop in global demand with Japan on the sidelines.

What's clear is that Japan appears to have lost at least 10 percent of its power production. Not only is there significant damage to several nuclear reactors at the Fukushima Daiichi nuclear power plant, but coal-fired plants in the north were also damaged and coal supplies were soaked by the tsunami.

This all challenges Japan's manufacturing prowess, since industry needs electricity. Already automakers and cell-phone companies have been forced to shutter operations, at least temporarily, because of disruption to their famed just-in-time manufacturing processes; that's where manufacturers don't keep large inventories and instead rely on prompt delivery from suppliers on an as-needed basis.

"For the US companies, for Chinese companies, it could be a problem for a few weeks, or a month. The hardest hit will be autos, telecom — with things like cell phones," said Nariman Behravesh, chief economist for forecaster IHS Global Insight. "But sales of other cars and cell phones that aren't dependent on Japanese components may see a boost."

Another consequence of Japan's woes is that Japanese investment will turn increasingly inward. Japan has traditionally been the second-largest foreign investor in the United States after Great Britain, but it'll need to focus its investment on internal repair and restoration indefinitely now.

Japan was also the second-largest holder of US government debt last year, after China. There are some concerns that Japan's government could stop purchasing long-term US government bonds, driving up the interest rate the US government would have to pay to attract other investors.

"I think the concern here is exaggerated, in the sense that some private investors may want to divest their Treasury portfolio (investments) in an attempt to secure funds. But the impact of that would be for the yen to rise in value; that's the last thing the Bank of Japan and the Japanese government want," said Behravesh. He said that Japan's government would purchase even more US debt if necessary to drive down the value of its yen against the dollar in order to help Japanese exporters at such a crucial time.

Trade flows are also sure to be impacted. There's likely to be at least a temporary drop in freight moving through bustling US West Coast ports, such as Los Angeles-Long Beach, San Francisco and Seattle.

"We're trying to avoid the speculation. We're just kind of waiting to see if there are ship diversions, rerouting, and how affected the ports that are not damaged will be," said Phillip Sanfield, a spokesman for the Port of Los Angeles.

Most of the port's trade with Japan, which accounts for 15 percent of the cargo moving through Los Angeles and lags only trade with China, is with the ports of Tokyo and Kobe, which appear to be back in operation. Only 3 percent of the port's trade, measured in value, was with Sendai and other northern ports that were heavily damaged.

Global energy markets will have to adjust to new conditions in Japan, which generates about a third of its electricity from coal, about a quarter from nuclear plants and another quarter from natural gas. Australia and Indonesia are the largest coal suppliers to Japan, and although US coal exporters are not big players there, they are expected to benefit, as Japan needs more coal and natural gas to power its plants.

U.S-Japan Trade At a Glance

Japan is the fourth-largest US trading partner, after neighbors Mexico and Canada and the Asian power, China. Japan took in 4.8 percent of US exports in 2009, the last full year for which data is available. US manufacturers of medical equipment, aircraft and machinery depend heavily on Japanese purchases, as do US farmers and cattlemen.

US imports of Japanese goods accounted for 6.2 percent of all imports into the United States in 2009. Americans purchase imported cars and trucks from Japan, as well as machinery and components for use in final manufacturing or assembly.

The two countries invest heavily in each other as well. The stock of US foreign direct investment in Japan stood at \$79.2 billion in 2008, the last full year for available US government data. Japanese foreign direct investment in the United States was three times that at \$259.6 billion during the same year, according to State Department statistics.

Japan Adds To Global Economy Woes (WSJ)

By Patrick Barta, Yoshio Takahashi And Bob Davis

[Wall Street Journal](#), March 16, 2011

Full-text stories from the Wall Street Journal are available to Journal subscribers by clicking the link.

US A Safer Haven Amid Global Financial Turmoil (LAT)

Most stock markets around the world have been battered in the aftermath of the Japan quake, but losses in the US have been relatively modest. Meanwhile, investors are pouring money into Treasury securities, driving their interest rates down.

By Tom Petrino And Nathaniel Popper, Los Angeles Times, 7:50 Pm Pdt, March 15, 2011

[Los Angeles Times](#), March 16, 2011

Amid the turmoil in global financial markets, hiding out at home has been a decent strategy for US investors.

Escalating social unrest in the Middle East and North Africa over the last few weeks has triggered a rush of money into US Treasury securities, driving their interest rates down sharply.

And in recent days, while most major stock markets around the world have been battered in the aftermath of Japan's devastating earthquake and tsunami, US stocks have held up surprisingly well.

On Tuesday, Japan's Nikkei-225 stock index plunged 10.6% — its biggest one-day drop since October 2008 — as investors panicked over rising levels of radiation escaping from the stricken Fukushima nuclear power complex.

The sell-off in Japan dragged down markets across Asia and in Europe. Yet US stocks climbed back from steep early losses to finish with relatively modest declines. The Dow Jones industrial average ended down 137.74 points, or 1.2%, to 11,855.42, paring what had been a loss of nearly 300 points at the opening bell.

Global upheaval "makes the US a better safe haven," said Gail Dudack, head of Dudack Research Group in New York.

Investors often gravitate to the biggest and most liquid securities in times of trouble, which typically means markets in the US, Japan and Europe.

But Japan can't play that role now, given the massive uncertainty about its economy in the near term.

And concerns about Europe's government debt crisis still pervade those markets, despite the European Union's decision last week to beef up a bailout fund for the most financially distressed countries.

Late Tuesday, Moody's Investors Service downgraded Portugal's debt rating to A3 from A1 and said the outlook was negative. Although the country may be able to reduce its crushing debt costs by using the EU's bailout fund, "Questions would remain as to when the government would be able to re-access the capital markets and on what terms," Moody's said.

Although the US government's soaring debt burden remains a source of deep concern to many investors, Uncle Sam still has no trouble borrowing. And as stock markets have crumbled in recent weeks, safety-seeking investors have flocked back to Treasury securities, pushing their yields down.

The annualized yield on five-year T-notes plunged to a six-week low of 1.98% on Monday from 2.05% on Friday. The yield fell further early Tuesday before ending at 1.96%.

Falling interest rates mean bonds are rising in value.

On Wall Street, stocks have pulled back over the last three weeks after surging early in the year on optimism about the economic recovery. But the losses have been far smaller than the declines in Japan and Europe.

With Tuesday's drop, the Dow is down 4.3% from its multiyear high reached Feb. 18. By contrast, the Japanese market has plunged 21% in the same period and the average European blue-chip stock is down 8.6%.

Some emerging markets also have weathered the latest market turbulence better than investors might have expected. The Brazilian market has eased just 1.6% since Feb. 18 after being hit harder earlier in the year.

Still, it isn't clear that US stocks can avoid deeper losses, particularly if oil prices resume their climb because of conflict in the Middle East and North Africa.

"The risks for the US market are more subject to what happens in the Middle East than what is occurring in Japan," said Alan Ruskin, chief foreign currency strategist at Deutsche Bank in New York.

Oil prices tumbled Tuesday amid a general sell-off in commodities, as investors and traders dumped high-risk assets across the board.

Crude futures in New York fell \$4.01 to \$97.18 a barrel, the lowest closing price since Feb. 28, despite a declaration of a state of emergency in Bahrain as its government sought to put down the popular uprising challenging the monarchy.

Traders said worries about Middle East oil supplies were being offset, for now, by expectations of lower demand from Japan as its economy reels from the earthquake and tsunami.

Prices of corn, wheat, cotton and coffee also plummeted Tuesday.

"It's just, 'Get out of the risk' — because you don't know what's going to happen" in Japan, said Frank Lesh, a trader at FuturePath Trading in Chicago. "You don't stand in the way of this."

Even gold — usually a popular haven in times of turmoil — slid as some investors took profits from the metal's recent surge. Near-term gold futures in New York fell \$32, or 2.2%, to \$1,392.60 an ounce.

Rising raw-material costs stoked inflation pressures worldwide in recent months, but traders now are uncertain about commodity demand as Japan's woes raise fresh concerns about global growth.

"This gives us some breathing room" on commodity prices, said Jim Swanson, chief investment strategist at MFS Investment Management in Boston.

US stocks also were buoyed Tuesday after Federal Reserve policymakers, holding a regularly scheduled meeting, said in their post-meeting statement that the domestic economy appeared to be on "firmer footing, and overall conditions in the labor market appear to be improving gradually" since late January.

However, the Fed also pledged to continue with its program of buying Treasury bonds to help suppress interest rates and underpin growth. That \$600-billion program will end as planned in late June, the Fed said.

Many stock market bears say Wall Street's powerful rally since late August has been fueled more by the central bank's easy-money policies than by economic fundamentals. Cheap money, critics say, has encouraged speculation in stocks and other high-risk assets.

But market bulls side with the Fed's view that the economy is gradually improving, which could underpin continued growth in corporate earnings. Analysts expect first-quarter operating earnings of the Standard & Poor's 500 companies to be up 13.5% from a year earlier, according to Thomson Reuters.

"The recipe is still there for the profit story to continue," Swanson said.

Some analysts say investors could soon begin focusing on the potential lift that Japanese rebuilding could give the global economy.

"When it comes to natural disasters, they destroy a lot, but in the effort to rebuild they generate a lot of new activity," said Jim Glassman, senior economist at JPMorgan Chase & Co. in New York. "The rebuilding effort is what really dominates in the long run."

Chris Rupkey, chief financial economist at Bank of Tokyo Mitsubishi in New York, said the panic that struck Tokyo shares Tuesday should subside as investors get more information about the extent of the damage at the Fukushima reactors and the threat it poses to the environment.

"If the radiation risk becomes known, this situation could calm down very quickly, and the Nikkei could come back an easy thousand points," Rupkey said.

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Wall Street Plummets On Japan Nuclear Threat (AFP)

[AFP](#), March 16, 2011

NEW YORK (AFP) — Panic selling hit the US stock market Tuesday as traders worried that a nuclear meltdown in quake-hit Japan could threaten the global economy.

The Dow Jones Industrial Average fell around 1.8 percent by midday in New York, losing over 200 points.

The New York Stock Exchange invoked a rarely used rule to smooth volatility, but to little avail as the prospects of multiple nuclear meltdowns at the Fukushima No.1 complex haunted the market.

"The global equity markets are posting solid losses following reports of rising nuclear radiation levels in Japan after more explosions hit an already damaged nuclear power facility," said analysts at Charles Schwab.

Four days after the world's third largest economy was struck by a massive earthquake and punishing tsunami, traders are still no closer to having a clear picture about spill-over risks.

"It is still too early to tell what the full impact of the March 11 earthquake, tsunami and growing nuclear crisis on Japan's infrastructure, industrial base and economic growth will be – let alone the broader global impacts," said Nariman Behraves an economist with IHS.

Amid the concern, billions of dollars were wiped of US share values, with blue chip stalwarts General Electric, 3M Company, Bank of America and Caterpillar posting heavy losses.

Traders hedged against many Japan-related and nuclear-related stocks.

GE, which sells nuclear technology, was down 3.1 percent.

Toyota's US-traded shares fell 2.9 percent.

The Dow Jones Industrial Average was 212.07 points lower (1.77 percent) at 11,731.09 by 1600 GMT, after dropping nearly 300 points in the minutes after opening.

The tech-rich Nasdaq Composite dropped 45.14 points (1.67 percent) to 2,655.83 and the S&P 500-stock index, a broader measure of the markets, shed 22.78 points (1.76 percent) at 1,273.61.

That echoed earlier losses on indexes in Japan, Hong Kong and Europe.

Tokyo stocks suffered their biggest one-day fall since the 2008 Lehman shock on Tuesday, with the main Nikkei index ending 10.55 percent lower, after losing as much as 14 percent at one point.

Meanwhile the bond market fretted that Japan – which is the second largest holder of US debt, holding \$886 billion in January – might trim back its US bond holdings.

But that fear was overshadowed by the perceived safe-haven provided by US debt, and bond prices firmed.

The yield on the 10-year Treasury bond fell to 3.29 percent from 3.35 percent late Monday, while that on the 30-year bond declined to 4.47 percent from 4.52 percent.

Bond yields and prices move in opposite directions.

Japan Crisis Puts World Financial Markets On Edge (AP)

Associated Press, March 16, 2011

NEW YORK – Fears over the escalating nuclear crisis in Japan overtook financial markets around the globe Tuesday, pushing stocks and other investments lower. The Japanese stock market lost 10 percent of its value, and Wall Street dropped steeply before bouncing back.

The Japanese Nikkei average fell to its lowest level in nearly two years after the country's prime minister said four crippled reactors at a nuclear power plant on the country's devastated coast were leaking dangerous amounts of radiation.

In the US, the Dow Jones industrial average fell almost 300 points at the opening bell. The futures market, which can indicate how stocks will perform, looked so ugly before trading began that the New York Stock Exchange invoked a special rule to smooth volatility.

The Dow recovered somewhat later in the day but still closed down 138 points, or more than 1 percent.

"It's a situation where you sell first and ask questions later," said Peter Cardillo, chief market economist at New York-based brokerage house Avalon Partners.

Investors sold stocks primarily because of fear that the disaster in Japan would slow down the global economy. Japan is the world's third-largest economy, manufacturing goods from computer chips to automobiles, and buys 10 percent of US exports.

The jarring day came less than a week after the two-year anniversary of the low point for the markets after the 2008 financial crisis. Stocks have almost doubled in value since March 9, 2009.

Over the last five trading days, however, the Standard & Poor's 500 index has nearly lost 3 percent because of higher oil prices, signs of weaknesses in China's economy, and the still unknown impact of the quake and tsunami in Japan.

"Markets are going to remain on edge until we know the full extent of the situation in Japan," said Michael Ryan, chief investment strategist with UBS Wealth Management.

The Japanese markets have taken a huge hit since the quake and tsunami struck last week. The Nikkei average fell a staggering 10.6 percent Tuesday, more than 1,000 points, and has suffered its worst two-day loss in 40 years.

In addition to Japan, investors on Wall Street fretted about the Middle East, where Saudi Arabian troops moved into Bahrain and Libya's oil exports ground to a halt because of the rebellion against leader Moammar Gadhafi. Government bonds and other assets considered safer investments rose in price.

Stocks pared earlier losses after the Federal Reserve said that the US economy was on "firmer footing." Still, 29 out of the 30 stocks that make up the Dow industrial average closed lower for the day.

Intel Corp., and Cisco Systems Inc. had the steepest falls, in part because they depend on Japanese factories for products or parts. Insurer Aflac Inc., which does 75 percent of its business in Japan, fell nearly 6 percent, the biggest drop in the S&P 500.

The Dow Jones industrial average closed down 137.74 points, or 1.1 percent, at 11,855.42. The S&P fell 14.52 points to 1,281.87. All 10 types of companies that make up the index finished lower. Utilities had the largest fall, losing 1.9 percent, because of concerns that the disaster in Japan will make countries rethink plans for nuclear energy. First Solar, a company that makes solar panels, gained 8.1 percent to lead the S&P index.

The Fed's statement pushed government bond prices down from their highest levels of the year. Bonds typically rise when investors seek safer assets and fall when the economy is growing.

In response to questions from the Senate Banking Committee on Tuesday, Treasury Secretary Timothy Geithner dismissed worries that Japan, which holds the most American government debt after China, would sell its holdings to pay for its rebuilding efforts.

"Japan is a very rich country and has a high savings rate," he said. It "has the capacity to deal not just with the humanitarian challenge but also the reconstruction challenge they face ahead."

If Japan dumped its holdings, it could force Treasury prices down and yields up. That would force long-term interest rates higher and put the US economic recovery at risk.

The opposite happened after an earthquake devastated Kobe, Japan, in 1995, according to a report from economists at the Royal Bank of Canada. By 1997, Japan had actually doubled its Treasury holdings to \$300 billion.

The yield on the benchmark 10-year Treasury note fell to 3.32 percent from 3.36 late Monday.

Oil prices fell \$4 to \$97.18 a barrel, their lowest level in two weeks, because demand for energy is expected to fall in Japan, the world's third-largest importer of oil. Questions over how long it will take the Japanese economy to recover pushed commodity prices lower around the globe. Wheat, corn, and sugar contracts all fell by 5 percent or more.

World Markets Dive As Investors Retreat To Safety (NYT)

By Graham Bowley

[New York Times](#), March 16, 2011

The financial aftershocks from the earthquake in Japan gathered force on Tuesday as investors fled from riskier assets like stocks, oil and gold amid growing worries that the crisis could slow a global economy that only recently seemed to be getting back on its feet.

Unnerved by a 16 percent drop in Japanese shares in the first two trading days of the week, stock markets slumped as investors sought safe havens like United States dollars and Treasury bonds, pushing interest rates lower. By the close of trading in New York, however, shares of United States companies recovered some of their losses after the Federal Reserve said it would keep its accommodative monetary policy in place to stimulate the United States economy.

The Fed's announcement brought calm on a day of market turmoil that raised painful memories for some of 2008, when the financial crisis froze capital markets and precipitated a similar rush for safety. "This was a very scary day for global stock markets," said Carl B. Weinberg, chief economist at High Frequency Economics.

After the roller-coaster session, the Standard & Poor's 500-stock index, which at one point had been down 35 points, closed down 14.52 points, or 1.12 percent, at 1,281.87. On Wednesday in Tokyo, markets regained some lost ground, climbing 6.2 percent in the first half-hour of trading.

But on Tuesday, the uncertainty extended to energy markets, as analysts warned that diminished growth in Japan could prompt a sharp decrease in oil demand.

"We don't know the extent to which the post-tsunami Japan is going to grow, and whether or not there will be consequences for other countries as well," said Chris Lafakis, an energy economist for Moody's Analytics.

Amid the flight to safety, oil prices fell \$4.01 to settle at \$97.18 a barrel, while gold dropped \$30.70 to close at \$1,395.70 an ounce. The Treasury's 10-year note rose 14/32, to 102 22/32. The yield fell to 3.30 percent, from 3.36 percent late Monday.

The central fear is that the disaster — especially the danger of increased radiation exposure from stricken Japanese nuclear reactors — could rip a big hole in the supply lines of the world's third largest economy and set back the global recovery.

Indeed, some of the first ripples reached the United States on Tuesday as Subaru said it was canceling all overtime at its plant in Lafayette, Ind., which builds the Outback, Legacy and Tribeca models, in order to reduce the chance that it will run out of some parts from Japan.

"The main economic shock is not the direct loss of business, but spillover effects in terms of damage to the power and transportation industries and disruptions to the supply chain," said Ethan S. Harris, an economist at Bank of America Merrill Lynch. "Specifically, many auto and electronics firms rely on the affected region for parts."

As a result of the volatility, several debt offerings were postponed, while Toys "R" Us was forced to delay a planned syndicated loan.

The ultimate impact on world growth is likely to be small, however. "The quake-ravaged economy, the world's third largest, could lower economic activity in Japan as much as one percentage point, and shave off worldwide growth 0.2 percentage point in 2011," said Bernard Baumohl, an economist at the Economic Outlook Group.

The region affected by the quake accounts for only about 6 percent of Japanese gross domestic product, and economists calculate that the short-term effects might be eventually offset as Japan spends hundreds of billions to rebuild.

Closer to home, a temporary reduction in American exports to Japan might trim 0.1 to 0.2 of a percentage point from United States economic growth in 2011, according to Stuart Hoffman, chief economist at PNC.

One major exporter, General Electric, which designed the reactors at the Fukushima nuclear plant, fell for the second day in a row, closing down 1.6 percent at \$19.61. G.E. has either built or licensed 92 nuclear reactors now operating worldwide — about 20 percent of the global total, according to Michael Tetuan, a spokesman for General Electric.

But nuclear power development remains a small part of the company's overall operation; it produces reactors in partnership with Hitachi. The business accounted for just \$1 billion in revenues in 2010 — a tiny fraction of the \$85 billion generated by its industrial supply business.

"Nuclear is not a major piece of the puzzle for G.E.," said Daniel Holland, an analyst with the investment research firm Morningstar. "This doesn't move the needle a whole bunch."

Despite the problems in Japan, the Japanese yen strengthened, as speculation increased that big Japanese investors like pension funds and banks — Japan is the second-largest holder of United States Treasuries — would dump their overseas holdings and buy yen to return cash home.

At the same time, there were signs that investors were unwinding other trading positions. With interest rates near zero at home, Japanese investors used yen to buy Australian and Canadian dollars, as well as the Brazilian real, in order to invest in higher-yielding assets there. Other foreign investors placed similar bets, bullish on those countries' growth prospects.

But as demand for the yen picks up, those currencies have weakened. Indeed, the Canadian dollar fell 1.5 percent on Tuesday morning, while the Australian dollar fell around 2 percent. The Brazilian real has fallen nearly 4 percent since Friday.

Across Wall Street, traders said the initial reaction among many hedge funds and institutional investors to the Japanese crisis was to sell first and ask questions later.

"It's definitely been risk-off since Friday," said Ward McCarthy, chief financial economist with Wall Street investment bank Jefferies & Company. "Uncertainty tends to breed a desire for safety. As it becomes easier to assess what all of the ramifications are, I suspect that will recede."

For instance, Robin Thorn, who oversees the \$1.3 billion PineBridge Global Equities mutual fund, decided on Sunday evening to cut the fund's 9 percent position in Japanese stocks in half.

With the help of his team of more than two dozen analysts in Tokyo — many who have been sleeping in their offices — Mr. Thorn sold off companies that had exposure to nuclear-plant construction. "That turned out to be the right thing in the shorter term," Mr. Thorn said.

But Mr. Thorn said he and his team were also looking for buying opportunities, saying he had increased the fund's stake in companies that will play a role in Japan's rebuilding.

And on Tuesday afternoon as Japanese American Depositary Receipts and exchange-traded funds rebounded sharply from early lows, Mr. Thorn said he expected Japanese markets to rally.

"We feel a lot of the emotional selling has been done," Mr. Thorn said. "And it's clear through the action of US-based investors today that people are now trying to look for bargains."

Markets Take Fright At Nuclear Crisis (FT)

By Richard Milne And Javier Blas In London

[Financial Times](#), March 16, 2011

Full-text stories from the Financial Times are available to FT subscribers by clicking the link.

Japan Crisis Revives Global Nuclear Debate (WP)

By Keith B. Richburg

Washington Post, March 16, 2011

BEIJING — The crisis in Japan has revived anti-nuclear passions around the world, putting governments on the defensive and undermining the nuclear power industry's recent renaissance as the clean energy of the future.

In the most dramatic move, German Chancellor Angela Merkel announced Tuesday that all seven of the country's nuclear power plants built before 1980 would be shut down, at least for now, as safety checks are conducted. The decision came one day after the government, facing strong public opposition to nuclear energy ahead of upcoming regional elections, suspended plans to extend the life of its aging plants.

Switzerland, with five reactors, announced Monday that it would freeze plans to build or replace nuclear power plants, and Austria called for new stress tests on plants across Europe.

Yet other countries, including Italy, where a Franco-Italian partnership is planning to start construction on a nuclear plant in 2013, have called for calm, with authorities saying the crisis should not derail plans to expand nuclear energy.

White House officials defended the use of nuclear power in the United States, which President Obama has embraced throughout his administration. "At this time, we don't have any information that would cause us to do anything different," Gregory B. Jaczko, chairman of the Nuclear Regulatory Commission, said at a White House briefing Monday.

In France, where nuclear plants produce 80 percent of electricity, the Japanese calamity reenergized a long-dormant political debate about the country's heavy reliance on nuclear power.

Government officials sought to reassure the public that France's more than 50 nuclear plants are safe, and President Nicolas Sarkozy told his political coalition that the plants were among the safest in the world.

The main opposition Socialist Party was divided, with key leaders saying it would be foolhardy to abandon a nuclear energy program that has stood since the 1970s but several Socialist figures demanding a reconsideration of nuclear safety measures.

Europe Ecology-Greens Party activists, long opposed to nuclear power, called for a referendum on whether France should get out of the nuclear business and accused the government of playing down the risks.

"We have to end the myths," said Cecile Duflot, a prominent Green leader. "Zero-risk nuclear power production does not exist."

In Russia, Ukraine and Belarus — which will mark the 25th anniversary of the Chernobyl disaster this April — the crisis in Japan has served as a reminder of the dangers of nuclear power, but national leaders say they don't see any alternative.

Russia is building six new nuclear power plants and has plans for more. It also recently signed an agreement with Belarus to build one there.

Ukrainian Prime Minister Mykola Azarov said Tuesday that Kiev is moving ahead with plans to build two new reactors at the Khmelnytsky power plant. "I believe there is no possible alternative to the use of nuclear energy," he said at a news conference during a visit to Istanbul, "and only rich countries can afford to discuss the possibility of closing" nuclear plants.

Environmental groups disagree. "The example of Japan vividly demonstrates that even if properly maintained, nuclear power engineering is extremely dangerous," Greenpeace Russia head Ivan Blokov told Interfax on Monday.

In Britain, where officials have laid out plans for a new generation of 10 nuclear power plants, the government has commissioned a fresh report on nuclear safety, while opponents vowed a new campaign of public pressure.

"The risks from nuclear energy remain unchanged; there were always risks," said Stephen Tindale, a British environmentalist. "But they will clearly need to be properly reassessed in the light of what's happening in Japan, and that's inevitably going to mean that the nuclear renaissance is going to be a smaller renaissance than it would have been."

Even in tightly controlled China, a debate on nuclear safety seemed to be underway.

According to the London-based World Nuclear Association, China has 13 nuclear power reactors in operation and 27 others under construction. An additional 50 reactors are in the planning stage, and more than 140 others have been proposed, the association says. China, like Japan, is prone to earthquakes.

Government officials have said China's nuclear program, the world's most ambitious, will continue unabated, but they have also tried to allay fears about the potential dangers. Officials have said the plants being built here, unlike Japan's older plants, are new-generation models that do not rely on electrical power for their cooling systems but instead are fitted with large tanks of water operating by gravity in the event of a crisis.

But concern about the possibility of a nuclear leak in China dominated discussions on the country's burgeoning microblogging sites, the country's newest forum for the public to voice unfettered views.

"How many nuclear power plants are there in our country? Are they all far away from the seismic zones . . . ?" Zheng Yuanjie, a well-known author of children's books, wrote on his microblog.

In Taiwan, environmentalists, civil engineers and the opposition party called for the government to immediately halt construction of a fourth nuclear plant, slated to go online in late 2012. Just 100 miles off the coast of China, Taiwan lies on the same arc of tectonic plates as Japan.

Trying to allay public fears, President Ma Ying-jeou ordered safety checks Tuesday of Taiwan's three existing plants but dismissed calls to put the fourth plant on hold.

In India, activists and villagers who have waged a two-year struggle against a proposed nuclear plant in Jaitapur, in Maharashtra state, said the events in Japan have given them a new tool to fight the government.

"What is happening in Japan has reenergized our opposition to the nuclear plant here," said Vaishali Patil, an anti-nuclear campaigner.

The proposed plant will be built by the French company Areva. India now has 20 nuclear reactors in seven power plants.

The Indian government set aside sites for American, French and Russian-built nuclear reactors across the country after New Delhi signed a landmark 2005 nuclear accord with the Bush administration.

India's environment minister, Jairam Ramesh, said Tuesday that "if additional safeguards have to be built in as part of the environmental clearance, we will certainly look at it."

Germany Shuts 7 Reactors For 3-Month Review (NYT)

By Judy Dempsey

[New York Times](#), March 16, 2011

BERLIN — With the crisis in Japan raising fears about nuclear power, Chancellor Angela Merkel said on Tuesday that she will temporarily shut down seven German nuclear power plants that began operations before the end of 1980 as officials begin a three-month safety review of all of the country's 17 plants.

The move came as European energy ministers in Brussels considered the introduction of stress tests in order to see how the bloc's 143 nuclear plants would react in emergencies. Construction procedures too might be reassessed, according to Olivier Bailly, a spokesman for the European Union Commission.

"We really need to have a better view of the operation in Europe," Mr. Bailly said as energy ministers met. Nuclear safety will also be raised at the G-20 summit meeting, which will be held in France at the end of the month, Mrs. Merkel said, adding that she had already spoken with Nicolas Sarkozy, the French president.

Mrs. Merkel said the shutdowns in Germany were based on a government decree. Germany is one of the first European countries to halt operations at some reactors in response to the nuclear disaster in Japan. Mrs. Merkel made the announcement after holding emergency talks with the leaders of the 16 German states. The closure of the seven plants means that Germany will have to speed up the development of alternative energy sources, such as renewables, wind and solar power.

It was not immediately clear if the seven plants would remain closed after the end of the three-month review period, said Environment Minister, Norbert Röttgen who briefed reporters after the meeting. On Monday, Switzerland joined Germany in saying that it would reassess the safety of nuclear reactors and possibly reduce reliance on them.

Doris Leuthard, the Swiss energy minister, said Switzerland would suspend plans to build and replace nuclear plants. She said no new ones would be permitted until experts had reviewed safety standards and reported back. Their conclusions will apply to existing plants as well as planned sites, she added. Swiss authorities recently approved three sites for new nuclear power stations.

Germany will suspend "the recently decided extension of the running times of German nuclear power plants," Chancellor Angela Merkel told reporters in Berlin. "This is a moratorium and this moratorium will run for three months." She said the suspension would allow for a thorough examination of the safety standards of the country's 17 nuclear power plants.

"There will be no taboos," Mrs. Merkel said.

Even when the three months is over, Mrs. Merkel warned, there would be no going back to the situation before the moratorium.

Across Europe, officials worried about the Continent's use of nuclear power as cooling systems failed at a third nuclear reactor in Japan and officials in that country struggled to regain control.

The European Union called for a meeting on Tuesday of nuclear safety authorities and operators to assess Europe's preparedness. Austria's environment minister, Nikolaus Berlakovich, called for a European Union-wide stress test "to see if our nuclear power stations are earthquake-proof."

In Germany, with Mrs. Merkel's center-right coalition facing important regional elections this month, the move was apparently in part an effort to placate the influential antinuclear lobby and give her coalition some breathing space before making a final decision about nuclear energy.

The foreign minister, Guido Westerwelle, called for a new risk analysis of the country's nuclear plants, particularly regarding their cooling systems. He is the leader of the pro-business Free Democratic Party, which strongly supports nuclear power.

A previous government, led by the Social Democrats and Greens, pushed through legislation in 2001 to close all of the country's nuclear plants by 2021. But Mrs. Merkel's center-right government reversed that decision last year and voted to extend the lives of the plants by an average of 12 years.

Nuclear energy provides about 11 percent of Germany's energy supply but its contribution to electricity output is about 26 percent.

In Switzerland, the suspension of plans to build and replace plants will affect all "blanket authorization for nuclear replacement until safety standards have been carefully reviewed and if necessary adapted," Ms. Leuthard, the energy minister, said in a statement.

Switzerland has five nuclear reactors, which produce about 40 percent of the country's energy needs.

Ms. Leuthard said she had already asked the Federal Nuclear Safety Inspectorate to analyze the exact cause of the problems in Japan and draw up new or tougher safety standards "particularly in terms of seismic safety and cooling."

In Russia, Prime Minister Vladimir V. Putin said his government would not revise its ambitious program of building nuclear reactors but would "draw conclusions from what's going on in Japan," Russian news agencies reported. Nuclear power currently accounts for 16 percent of Russia's electricity generation.

From Japan's Devastation, Our Lisbon Moment? (WP)

By Harold Meyerson

[Washington Post](#), March 16, 2011

First came the earthquake, then the tsunami and the fires, and then, over time, a critical decline in belief in a benevolent God.

The Great Lisbon Earthquake of 1755 killed about a fifth of the city's 200,000 residents and leveled 85 percent of its buildings, including almost every major church — on a church holiday, when they were packed with parishioners. It also shook 18th-century philosophers to the core. "Candide," Voltaire's comic polemic against the belief that all was for the best in this best of all possible worlds, was written in the quake's aftermath, as Voltaire was abandoning any notion of godly oversight of the world's affairs. The young Immanuel Kant was sufficiently upset to research and write one of the first books ever on the causes of quakes, before he turned to his life's work of creating ethical codes that functioned in both the presence and absence of God.

Today, the quake, tsunami and, most particularly, the potential of a nuclear catastrophe in Japan should weaken at least one of our own deeply rooted faiths — in our own infallibility. Consider, for a moment, all the systems that the experts said had been rendered safe, foolproof and immune to disaster, and that nonetheless crashed during the past three years. There was the financial system, an assemblage of immense wagers on all manner of things, which an array of mathematicians and economists assured us could not possibly come tumbling down. There was deep-water oil drilling, which the oil companies' geologists, among others, insisted could not possibly result in a cataclysmic spill. And today, there are nuclear power plants, safeguarded, their engineers have told us, against the oh-so-remote possibilities of meltdowns.

These assurances — at least, most of them — were not given in bad faith. Wall Street's quants genuinely believed that they had erected a stable system, as did the geologists and the nuclear engineers. The equations were elegant; things penciled out. At long last, humankind had triumphed over risk.

Except when it hadn't.

What all these wizards did not factor in was that these were all just as much human and social systems as they were mathematical. Behind the equations were human and social assumptions, rooted in such human and social impulses as greed, denial and hubris. The derivatives that the banks' economists had devised were said to distribute risk so widely that they made the system safe; but in fact, they interlocked risk so completely that they brought the system down. But they also brought the banks such massive profits that few on Wall Street wanted to recognize the risks that economists not in Wall Street's sway had detected and identified.

What the systemic failures on Wall Street, in the Gulf of Mexico and in Japan should teach us is that the need for active, disinterested governmental regulation is rooted not in any radical impulse, as the American right continually contends, but in a sober, conservative assessment of the human capacity for mistake and self-delusion, not to mention avarice and chicanery. We can underestimate the risks of a particular undertaking, even when we think we have guarded against them. We fall prey to our own sense of infallibility, often as a way to rationalize what is otherwise a risky endeavor. When those risks go bad, the consequences often fall on those who didn't take those risks themselves, as the millions of Americans who lost their jobs thanks

to Wall Street's follies can attest. This is a concept that libertarians don't seem able to grasp, which is why the rise of libertarianism within Republican ranks is bad news for food safety, clean air, economic stability and the like.

The market may in time punish bad actors, which is the ostensible safeguard that libertarians prefer to regulation. Yet as the people sealed inside their homes in the vicinity of Japan's malfunctioning nuclear plant could tell us, untold numbers of innocents may pay a much higher price, more quickly, than the executives and shareholders of offending companies. For that matter, shareholders and non-shareholders alike, all across the planet, may soon feel economic pain as a consequence of Japan's insufficient precautions.

And yet, the war on regulation in America — backed by Wall Street and such energy-industry leaders as the Koch brothers — rolls on. Before last week's quake, House Republicans cut funding for training first responders to radiation disasters. Japan, one hopes, should bring an end to such nonsense. It's time for our own Lisbon moment. We haven't defeated risk. We haven't engineered the glitches out of the system. We need some rules, some regs, and a government willing to devise and enforce them.

The Future Of Nukes, And Of Japan (WSJ)

When all is said and done, nuclear power plants will not top Japan's list of worries.

By Holman W. Jenkins

[Wall Street Journal](#), March 16, 2011

Full-text stories from the Wall Street Journal are available to Journal subscribers by clicking the link.

US Sends Supercomputer Experts To Assess Radiation Risks In Japan (NATJO)

By Ronald Brownstein

[National Journal Daily](#), March 16, 2011

The US agency charged with protecting America's nuclear weapons has deployed a team of stateside supercomputer experts to gauge the radiation risks posed by the nuclear crisis in Japan.

In addition to safeguarding the nuclear stockpile, the National Nuclear Security Administration is regarded as the chief responder to any radiological incident within the United States. As such, some experts say NNSA is uniquely positioned to aid in Japan, where explosions rocked a nuclear power plant following an 8.9 magnitude earthquake on Friday.

The ability of the agency, which is part of the Energy Department, to arm decision-makers with accurate information about the extent of the nuclear threat largely rests on supercomputers.

NNSA officials on Monday said they have activated the National Atmospheric Release Advisory Center — staffed by computer scientists, nuclear scientists and meteorologists — to provide US authorities with real-time estimates on the spread of radioactive materials in the atmosphere. The squad's specialists plug data in to supercomputer algorithms on radiation doses, exposure, hazard areas, meteorological conditions and other factors to produce predictive models.

"NNSA has probably the world's premier set of codes that are capable of doing advanced simulations on all things nuclear," said Stanley C. Ahalt director of the Renaissance Computing Institute in the Research Triangle area of North Carolina. "Not only do they have codes that are capable of understanding the degrading of the nuclear stockpile, but also that are capable of simulating, at the physical level, very sophisticated interactions between materials that are necessary for reactors to operate."

The crew is located in California at the Lawrence Livermore National Laboratory, which houses the BlueGene/L and Dawn supercomputers, ranked Nos. 12 and 16 on the biannual list of the world's most powerful supercomputers. A machine in China holds the No. 1 spot on the Top 500 list, but, Ahalt said, "the Chinese don't have anywhere near the experience in working on these types of problems that NNSA has."

Shaking caused by Friday's quake and a subsequent tsunami knocked out cooling systems at the Fukushima Dai-ichi nuclear complex, which has led to some melting in reactor cores. "Each of these reactors was constructed at different times with different materials and is at different levels of aging," Ahalt said.

Now, Japanese officials are rushing to cool down fuel rods via manual methods, such as spraying water into the reactors, to prevent a meltdown, which likely would have lasting, deadly effects.

Destruction on the scale of the 1986 Chernobyl accident that leaked massive amounts of radioactive materials into the environment is not expected. "But the residual heat is still captured in those uranium rods," Ahalt noted. NNSA has the tools to form assumptions on how the core material might degrade, he said.

NNSA officials are in communication with Japanese officials, the US agency said on Monday.

"Senior officials and technical experts from the Department of Energy continue to be in close contact with other agencies as well as with our Japanese counterparts as we work to assess what is a very serious and fluid situation," NNSA spokesman

Damien LaVera said. "The United States will continue to work closely with the Japanese government and will provide whatever assistance they request to help them bring the reactors under control."

State Department officials on Monday advised US citizens in Japan to heed the directions of Japanese authorities in vacating the affected area.

"Japan's Nuclear Industrial Safety Agency has recommended that people who live within 20 kilometers of the Fukushima Nuclear Power Plant evacuate the area immediately," said John V. Roos, US ambassador to Japan. "We are confident that the government of Japan is doing all it can to respond to this serious situation."

On Sunday, the Nuclear Regulatory Commission, which polices US commercial nuclear power plants, said American officials do not foresee dangerous amounts of radiation reaching the United States.

"All the available information indicates weather conditions have taken the small releases from the Fukushima reactors out to sea, away from the population," NRC officials said in a statement "Given the thousands of miles between the two countries, Hawaii, Alaska, the US Territories and the US West Coast are not expected to experience any harmful levels of radioactivity."

MOX a concern in Japan reactor (AUGC)

By Rob Pavey

[Augusta Chronicle](#), March 16, 2011

Scientists warned this week of yet another wrinkle to Japan's evolving nuclear crisis: one of the doomed reactors is loaded with mixed-oxide fuel that contains plutonium.

"This sort of plutonium fuel is more difficult to control than uranium fuel," said Arjun Makhijani, a nuclear scientist and president of the Institute for Energy and Environmental Research.

The fuel, known generically as "MOX," was made by nuclear giant AREVA in France, where MOX technology has been used for almost two decades.

The rods, made by blending small amounts of plutonium with traditional uranium, were loaded into unit 3 of the Fukushima Daiichi nuclear plant last September.

Makhijani said the unit contains 32 MOX assemblies—or about 5 percent of the fuel now in the reactor, where an explosion this week kindled fears of a radiation release.

"With this fuel, the risks of accidental criticality are different," he said. "You have the same kinds of problems, they are just more intense with plutonium."

AREVA is also part of Shaw AREVA MOX Services—the group building the National Nuclear Security Administration's \$4.86 billion MOX plant at Savannah River Site.

The MOX fuels used in the Japan reactor and several dozen others are a mixture of uranium and plutonium reprocessed from spent uranium, but the facility at Savannah River Site is designed to use weapons grade plutonium from dismantled nuclear warheads to make fuels usable in commercial nuclear power reactors.

The plant's mission is to dispose of the weapons grade material to prevent exploitation by terrorists. But the search for utilities willing to use the fuel when production starts in 2018 has moved slowly.

Currently, Tennessee Valley Authority is evaluating the use of MOX fuel in as many as five of its reactors, and a Richland, Wash., utility is mulling its use in one unit, but no formal user agreements have been signed.

Safety officials have pointed out that the problems in Japan were caused by the catastrophic, combined effects of the tsunami and earthquake—not by the type of fuel in the affected reactors.

In an emailed statement Tuesday, a National Nuclear Security Administration spokesman said US officials remain confident in the safety of existing programs.

"The American people should have full confidence that the US has rigorous safety regulations in place to ensure that our nuclear power is generated safely and responsibly," the spokesman said. "Information is still coming in about the events unfolding in Japan, but the Administration is committed to learning from Japan's experience as we work to continue to strengthen America's nuclear industry."

U.K. Nuclear Ambitions Blunted By Disaster Unfolding In Japan (WSJ)

The Source

By Selina Williams

[Wall Street Journal](#), March 16, 2011

Full-text stories from the Wall Street Journal are available to Journal subscribers by clicking the link.

China, Also On Fault Lines, Faces New Atomic Scrutiny (WSJ)

By James T. Areddy and Brian Spegele

[Wall Street Journal](#), March 16, 2011

Full-text stories from the Wall Street Journal are available to Journal subscribers by clicking the link.

Nuclear Plants In EU To Be Tested (WSJ)

By Alessandro Torello And Laurence Norman

[Wall Street Journal](#), March 16, 2011

Full-text stories from the Wall Street Journal are available to Journal subscribers by clicking the link.

Germany Halts All Pre-1980 Nuclear Power Plants To Conduct Safety Reviews (BLOOM)

By Tony Czuczka and Nicholas Comfort

[Bloomberg News](#), March 16, 2011

Germany will halt nuclear reactors accounting for 25 percent of its atomic energy capacity as part of a safety review after explosions at reactors in Japan.

The country will keep its seven oldest nuclear reactors offline as part of a nationwide safety review to run through June, Chancellor Angela Merkel told reporters in Berlin today. Two of the seven are currently offline, while the remainder totals 5.2 gigawatts of the 20.7 gigawatts installed over Germany's 17 reactors.

Germany, which relies on reactors for 23 percent of its power, is the first European country to take such measures after explosions at Japan's Fukushima plant sparked safety concerns. German electricity, a European benchmark, rose on the outlook for lower supply while European Union carbon dioxide permits gained as utilities may burn more fossil fuels to meet demand.

"A general re-think on nuclear power is on the cards," UniCredit SpA analysts including Lueder Schumacher wrote in a note today. The Japanese incident has "country-specific aspects that are unlikely to apply to Europe, but the nuclear debate, especially in Germany, is not governed by reason."

The federal government and premiers of the German states where nuclear-power stations are located have agreed that facilities "that began operation before the end of 1980 are being stopped for the duration of the moratorium," Merkel said after a meeting in Berlin today.

The seven reactors are E.ON AG (EOAN)'s Isar 1 and Unterweser, RWE AG (RWE)'s Biblis A and B, EnBW Energie Baden-Wuerttemberg AG (EBK)'s Philippsburg 1 and Neckarwestheim 1 as well as Brunsbuettel, which is co-owned by E.ON and Vattenfall AB. Biblis B is already offline for maintenance, while Brunsbuettel has been shut since June 2007 following a short circuit in a nearby power network.

E.ON has begun preparations to halt Isar-1, the Dusseldorf-based company said. EnBW said it will voluntarily shut down Neckarwestheim 1 on a temporary basis. RWE said it will halt Biblis A. The companies commented in separate e-mailed statements today.

Baseload electricity for next quarter in Germany rose to the highest price since November 2008, surging as much as 16 percent to 62.50 euros (\$86.80) a megawatt-hour. The next-year contract, a European benchmark, rose as much as 4.8 percent to 58.40 euros a megawatt-hour, its highest since October 2009.

European Union carbon dioxide allowances rose to the highest intraday price since May 2009. Permits for December rose 4.3 percent to 17.32 euros a metric ton on the ICE Futures Europe exchange as of 1:41 p.m. Frankfurt time today.

Nuclear-Free Europe?

Germany's move raises the prospect of a nuclear-free Europe, said Guenther Oettinger, the European Union energy commissioner, in an interview with ARD television today.

"It has to raise the question of whether we in Europe, in the foreseeable future, can secure our energy needs without nuclear power," he said before a meeting with European energy ministers, company executives and regulators in Brussels to discuss reactor safety.

Merkel faces March 27 elections in Baden-Wuerttemberg, a state that's home to four of the country's 17 reactors and has been controlled by her Christian Democratic Union for five decades. Eighty percent of Germans oppose Merkel's decision last year to extend the use of nuclear power by an average of 12 years past the previous phase-out date of about 2022, according to an Infratest poll for ARD television released late yesterday.

The chancellor said the government will use the three-month moratorium on the extension of the life of German nuclear plants, which she announced yesterday, to review whether the country can speed up the introduction of renewable energy.

To contact the reporters on this story: Tony Czuczka in Berlin at aczuczka@bloomberg.net; Nicholas Comfort in Frankfurt at ncomfort1@bloomberg.net.

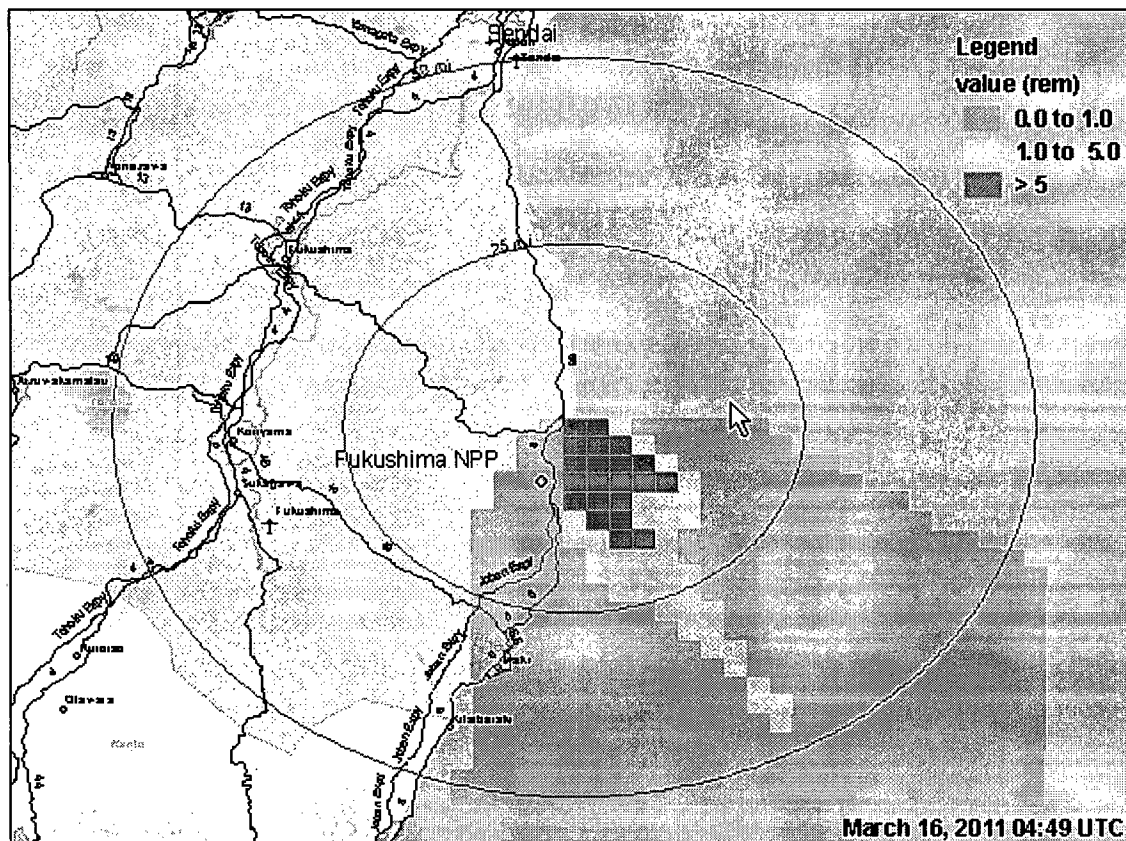
From: GIS Hoc
Sent: Wednesday, March 16, 2011 12:58 AM
To: Miller, Chris
Subject: ATTACHED PDF: Fukushima Unit 4 estimate for 50 miles - TEDE - Puff - 03162011 0437UTC withLegend
Attachments: Fukushima Unit 4 estimate for 50 miles - TEDE - Puff - 03162011 0437UTC withLegend.pdf

Requested document attached.

stephanie devlin
PMT Team GIS Analyst

III/58

Fukushima Unit 4 estimate for 50 miles - TEDE - Puff



From: GIS Hoc
Sent: Wednesday, March 16, 2011 8:59 AM
To: yong.li@nrc.gov

III 159

From: GIS Hoc
Sent: Wednesday, March 16, 2011 12:56 AM
To: yong.li@nrc.gov

III/60

From: GIS Hoc
Sent: Wednesday, March 16, 2011 12:56 AM
To: weijun.wang@nrc.gov
Subject: Fukushima No. plant before and after tsunami (before the explosion)

<http://www.huffingtonpost.com/2011/03/14/japan-satellite-photos-before-835556.html>

III/101

OIP_ITServices Resource

From: LIA02 Hoc
Sent: Wednesday, March 16, 2011 5:14 PM
To: Stahl, Eric; Emche, Danielle; Schwartzman, Jennifer; Tobin, Jennifer; Bloom, Steven; Baker, Stephen; Wittick, Brian; Jones, Andrea; Smirolfo, Elizabeth; Mayros, Lauren; Afshar-Tous, Mugeh; English, Lance; Young, Francis; Abrams, Charlotte; Fragoyannis, Nancy; Henderson, Karen; Owens, Janice; Shepherd, Jill
Subject: Scheduling for International Liaison Desk in Ops Center - March 21 - April 15

We plan to staff the International Liaison Desk(s) in Ops Center through April 15. Our plan is to have nine teams of two people. You will be expected to work for three consecutive days on a specific shift (7am-3pm, 3-11pm or 11pm-7am) and then have off for the following six days (for example, you will work the 7am shift on Monday, Tuesday and Wednesday; the next time you would work is next Wednesday).

Please respond to this email with:

- Any specific timeslot (NOT DATE) that you cannot work (i.e. if you know you can never work the 3-11pm shift)
- If you have a preference for the 3-11pm or 11pm-7am timeslot.

Once we populate the calendar, you will be able to swap on specific dates if necessary. We will attempt to shift people, so they are not required to work all overnights, all mornings, all evening, etc.

THANK YOU ALL AGAIN FOR YOUR HELP!

III/62

From: GIS Hoc
Sent: Wednesday, March 16, 2011 10:38 PM
To: PMT02 Hoc
Subject: File Location

M:\PMT\Fukushima\units 2 3 4 16 MAR 0700\50 MILE Unit 2 and 3 with 33% core damage each, Unit 4 with 100% - TEDE - Puff.shp

III/63

Wood, Jeffery

Wood, Jeffery

From: hirasawa-munenori@jnes.go.jp
Sent: Thursday, March 17, 2011 12:53 AM
To: Wood, Jeffery; Kreuser, Albert; francois.ducamp@irsn.fr; mjhwan@kaeri.re.kr; kalle.jankala@fortum.com; reino.virolainen@stuk.fi; rmc@csn.es; ralph.nyman@ssm.se; roland.beutler@ensi.ch; shane.turner@hse.gsi.gov.uk; Sancaktar, Selim; smain.yalaoui@cnsccsn.gc.ca; claus.verstegen@grs.de; Jean.Gauvain@oecd.org; Coyne, Kevin; M-JHwang
Cc: hirasawa-munenori@jnes.go.jp; yamashita-masahiro@jnes.go.jp; fujimoto-haruo@jnes.go.jp; hamaguchi-yoshikane@jnes.go.jp; ebata-shigeo@jnes.go.jp; sato-shohei@jnes.go.jp
Subject: I can't attend next 33rd ICDE meeting.

Dear all

I appreciate many of your kind E-mail.

I and my family are safe.

JNES and NISA are doing our best to control Fukushima NPPs accidents.

I can't attend next 33rd ICDE meeting.

Please find the NISA News Release in English from the NISA HP web as shown below.

This is the best way you could obtain the quick official release on the Seismic Damage Information from Japan.

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

Again all of Japanese government organization, TEPCO, others are doing our best to control Fukushima NPPs accidents, please understand about it.

best regards

M.Hirasawa

Incorporated Administrative Agency
Japan Nuclear Energy Safety Organization (JNES)

TOKYU REIT Toranomon Bldg 6F, 3-17-1, Toranomon, Minato-ku, Tokyo, 105-0001

Tel : +81(3)4511-1843 Fax : +81(3)4511-1879

E-mail : hirasawa-munenori@jnes.go.jp

III/b4

From: [Andersen, James](#)
To: [Weber, Michael](#); [Borchardt, Bill](#); [Virgilio, Martin](#); [Leeds, Eric](#); [Howe, Allen](#); [Johnson, Michael](#); [Landau, Mindy](#); [Rihm, Roger](#); [Ash, Darren](#); [Muessle, Mary](#)
Subject: FW: Commission Meeting on Japan Event has been announced for Monday (3/21) at 9:00 a.m.
Date: Friday, March 18, 2011 9:18:46 AM
Importance: High

FYI.

From: Laufer, Richard
Sent: Friday, March 18, 2011 9:16 AM
To: Kundrat, Christine; Wittick, Susan; Sargent, Kimberly; Fenton, Darlene; Humerick, David; Blakeney, Catherine; Boyd, NancyTurner; Lopez, George; Branch, Richard; Andersen, James; Stenberg, Danita; Shankar, Kala
Cc: Bates, Andrew; Laufer, Richard; Harrington, Holly; Akstulewicz, Brenda; Merzke, Daniel; Brenner, Eliot; Baval, Rochelle; Powell, Amy
Subject: Commission Meeting on Japan Event has been announced for Monday (3/21) at 9:00 a.m.
Importance: High

Just wanted to let you know that the meeting has been approved and announced for Monday morning (3/21) at 9:00 a.m. It should be posted to the NRC website shortly.

Thanks,
Rich Laufer
415-1661

III/05

Satorius, Mark

From: HOO Hoc
Sent: Thursday, March 17, 2011 2:31 PM
To: HOO Hoc
Subject: SID Notice: 3/17/2011
Attachments: EV003926.PDF

~~FOR OFFICIAL USE ONLY - LIMITED DISTRIBUTION~~

The following attached report may contain "law enforcement sensitive" information. Please do not relay this information to individuals who do not have a "need to know".

NOTE:

Adobe Acrobat Reader and a password are required to open the attached Emergency Response Officer's Report. A password has been sent to you by separate notification (emailed to NRC recipients). To open a password protected pdf document, start Adobe Reader and enter the password in lower case when prompted as the document is opened.

III/b4

From: [LIA07 Hoc](#)
Subject: 1700 EDT (March 17, 2011) USNRC Earthquake/Tsunami SitRep
Date: Thursday, March 17, 2011 5:47:03 PM
Attachments: [USNRC Earthquake-Tsunami Update.031711.1700EDT.pdf](#)

Attached, please find a 1700 EDT situation report from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami on March 17, 2011.

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

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

-Sara

Sara K. Mroz
Communications and Outreach
Office of Nuclear Security and Incident Response
US Nuclear Regulatory Commission
sara.mroz@nrc.gov
LIA07.HOC@nrc.gov (Operations Center)

III/67

From: Coyne, Kevin
To: Marksberry, Don; Kuritzky, Alan; Salley, MarkHenry; Beasley, Benjamin; Ott, William; Peters, Sean; Demoss, Gary
Subject: FW: 0700 EDT (March 17, 2011) USNRC Earthquake/Tsunami SitRep
Date: Thursday, March 17, 2011 8:55:00 AM
Attachments: NRC Status Update 3-17.11--07.00am.pdf

Fyi...

From: Barclay, Kevin
Sent: Thursday, March 17, 2011 8:52 AM
To: Coyne, Kevin; Ghasemian, Shahram
Subject: FW: 0700 EDT (March 17, 2011) USNRC Earthquake/Tsunami SitRep

At Rob Krseks request.....

From: Pederson, Cynthia
Sent: Thursday, March 17, 2011 6:55 AM
To: All R3 Users
Subject: FW: 0700 EDT (March 17, 2011) USNRC Earthquake/Tsunami SitRep

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

Spent fuel pools are currently biggest concern.

From: LIA07 Hoc
Sent: Thursday, March 17, 2011 6:16 AM
To: LIA07 Hoc
Subject: 0700 EDT (March 17, 2011) USNRC Earthquake/Tsunami SitRep

Attached, please find a 0700 EDT situation report from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami on March 17, 2011.
This Update corrects information about the US State Department's actions for employees in Japan.

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

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

-Jim

Jim Anderson
Office of Nuclear Security and Incident Response
US Nuclear Regulatory Commission
james.anderson@nrc.gov
LIA07.HOC@nrc.gov (Operations Center)

III/b8

Gray, Mel

From: Jackson, Donald
Sent: Thursday, March 17, 2011 7:30 AM
To: Burritt, Arthur; Dentel, Glenn; Gray, Mel; Krohn, Paul; Bellamy, Ronald; Powell, Raymond; Kennedy, Silas; Henderson, Pamela; Conte, Richard; Doerflein, Lawrence; Rogge, John; Hansell, Samuel
Subject: FW: 0700 EDT (March 17, 2011) USNRC Earthquake/Tsunami SitRep
Attachments: NRC Status Update 3-17.11--07.00am.pdf

FYI.....please do not forward

From: LIA07 Hoc
Sent: Thursday, March 17, 2011 7:16 AM
To: LIA07 Hoc
Subject: 0700 EDT (March 17, 2011) USNRC Earthquake/Tsunami SitRep

Attached, please find a 0700 EDT situation report from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami on March 17, 2011. **This Update corrects information about the US State Department's actions for employees in Japan.**

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-Jim

Jim Anderson
Office of Nuclear Security and Incident Response
US Nuclear Regulatory Commission
james.anderson@nrc.gov
LIA07.HOC@nrc.gov (Operations Center)

Satorius, Mark

From: Pederson, Cynthia
Sent: Thursday, March 17, 2011 6:55 AM
To: All R3 Users
Subject: FW: 0700 EDT (March 17, 2011) USNRC Earthquake/Tsunami SitRep
Attachments: NRC Status Update 3-17.11--07.00am.pdf

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From: LIA07 Hoc
Sent: Thursday, March 17, 2011 6:16 AM
To: LIA07 Hoc
Subject: 0700 EDT (March 17, 2011) USNRC Earthquake/Tsunami SitRep

Attached, please find a 0700 EDT situation report from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami on March 17, 2011. **This Update corrects information about the US State Department's actions for employees in Japan.**

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-Jim

Jim Anderson
Office of Nuclear Security and Incident Response
US Nuclear Regulatory Commission
james.anderson@nrc.gov
LIA07.HOC@nrc.gov (Operations Center)

From: [LIA07 Hoc](#)
Cc: [LIA07 Hoc](#)
Subject: 0600 EDT (March 17, 2011) USNRC Earthquake/Tsunami SitRep
Date: Thursday, March 17, 2011 6:42:29 AM
Attachments: [NRC Status Update 3-17.11--06.00am.pdf](#)

Attached, please find a 0600 EDT situation report from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami on March 17, 2011. This Update includes information related to the status of the Fukushima Daiichi Facility.

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

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

-Jim

Jim Anderson
Office of Nuclear Security and Incident Response
US Nuclear Regulatory Commission
james.anderson@nrc.gov
LIA07.HOC@nrc.gov (Operations Center)

III/69

From: Hoc, PMT12
Sent: Thursday, March 17, 2011 6:04 PM
To: PMT02 Hoc; GIS Hoc
Subject: FW: Monitoring information
Attachments: 1303724_8_1.pdf

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

From: LIA02 Hoc
Sent: Thursday, March 17, 2011 5:48 PM
To: PMT01 Hoc; Hoc, PMT12
Subject: FW: Monitoring information

FYI

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

From: Michael W. Chinworth [mailto:michael-chinworth@jnes-usa.org]
Sent: Thursday, March 17, 2011 5:47 PM
To: LIA02 Hoc; Emche, Danielle
Subject: Re: Monitoring information

Having the actual data might help...

On 3/17/2011 5:46 PM, Michael W. Chinworth wrote:

> Attached is the most recent exposure data released from the Ministry
> of Education:

>

> -- Measurement unit: $\mu\text{Sv/h}$

> -- Time period: From 17:00 hrs., March 16 through 17:00, March 17

> -- Locations:

> 1. Sapporo City, Hokkaido

>> 2. Aomori City, Aomori Prefecture (Pre.).

>> 3. Morioka City, Iwate Pre.

>> 4. Sendai City, Miyagi Pre.

>> 5. Akita City, Akita Pre.

>> 6. Yamagata City, Yamagata Pre.

>> 7. Futaba Village, Fukushima Pre.

>> 8. Mito City, Ibaragi Pre.

>> 9. Utsunomiya City, Tochigi Pre.

>> 10. Maebashi City, Gunma Pre.

>> 11. Saitama City, Saitama Pre.

>> 12. Ichihara City, Chiba Pre.

>> 13. Shinjuku, Tokyo

>> 14. Chigasaki City, Kanagawa Pre.

>> 15. Niigata City, Niigata Pre.

>> 16. Izumi City, Toyama Pre.

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> > 17. Kanazawa City, Ishikawa Pre.
> > 18. Fukui City, Fukui Pre.
> > 19. Kofu City, Yamanashi Pre.
> > 20. Nagano City, Nagano Pre.
> > 21. Kagamihara City, Gifu Pre.
> > 22. Shizuoka City, Shizuoka Pre.
> > 23. Nagoya City, Aichi Pre.
> > 24. Yokkaichi City, Mie Pre.
> > 25. Otsu City, Shiga Pre.
> > 26. Kyoto City, Kyoto Pre.
> > 27. Osaka City, Osaka
> > 28. Kobe City, Hyogo Pre.
> > 29. Nara City, Nara Pre.
> > 30. Wakayama City, Wakayama Pre.
> > 31. Tohi Village, Tottori Pre.
> > 32. Matsue City, Shimane Pre.
> > 33. Okayama City, Okayama Pre.
> > 34. Hiroshima City, Hiroshima Pre.
> > 35. Yamaguchi City, Yamaguchi Pre.
> > 36. Tokushima City, Tokushima Pre.
> > 37. Takamatsu City, Kagawa Pre.
> > 38. Matsuyama City, Ehime Pre.
> > 39. Kochi City, Kochi Pre.
> > 40. Dazaifu City, Fukuoka Pre.
> > 41. Saga City, Saga Pre.
> > 42. Omura City, Nagasaki Pre.
> > 43. Uto City, Kumamoto Pre.
> > 44. Oita City, Oita Pre.
> > 45. Miyazaki City, Miyazaki Pre.
> > 46. Kagoshima City, Kagoshima Pre.
> > 47. Uruma City, Okinawa Pre.
>
> Original data can be found at:
> http://www.mext.go.jp/a_menu/saigaijohou/syousai/1303723.htm
>
> I'll continue checking as well.
>
> Best,
> Michael C.
>

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