



NUCLEAR REGULATORY COMMISSION NEWS SUMMARY

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TODAY'S EDITION

NRC News:

NRC Doesn't Expect Immediate Changes For US Reactor Fleet	1
Coakley Wants NRC To Reopen Spent Fuel Storage Rules	2
Indian Point Owners Expect New NRC Regulations	2
US Nuclear Fleet Safety Has Improved In Recent Years	2
Lochbaum Says US Plants Are Just As Vulnerable To Catastrophe	3
NRC To Host Meetings On Indian Point, Robinson Plants	3
NRC Issues License Renewal For Vermont Yankee Plant	3
Entergy Eyes Cutting Funds For Pilgrim Plant Emergency Training	4
New Reactor Designs Will Make Use Of "Passive" Backup Cooling Features	4
Paper Favors Continued Use Of Nuclear Power	4
NRC, Dresden Officials Confident In Plant's Safety Systems	4
California Lawmakers Seek Detailed Seismic Studies For Nuclear Plants	5
NRC Inspects Ameren Callaway Nuclear Plant	5
South Texas Project Scales Back Expansion In View Of Japan Disaster	5
Arizona Corporation Commission Plans Safety Hearing	5
Scrutiny Turns To Planning For Nuclear Crisis	5
Nuclear Reactor Safety Coverage Continues	6
Barron Touts Constellation's Commitment To Safety	6

Exelon Bracing For Costs Of Expected Plant Upgrades	6
Florida Utility Eyeing Santee Cooper's Share Of New VC Summer Units	7
NextEra Expresses Support For Nuclear Power	7
Nine Mile Point Unit 1 Shutdown For Refueling	7
Judge Dismisses Challenge Of Nuclear Plant Tax Agreement	7
Connecticut Legislature Considering Tax On Oil, Coal, Nuclear Generators	7
Secretary Chu Cancels Trip To Brazil To Focus On Japanese Nuclear Crisis	7
Rep. Shimkus Questions Legality Of Closing Yucca	7
Vitamin Pill Helps Astronaut Deal With Radiation	8
Facts About NRC Considered	8

International Nuclear News:

700 Workers Evacuated From Fukushima Plant Monday	8
Chileans Protest US Nuclear Deal Signed Friday	10

Online Version

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NRC NEWS:

NRC Doesn't Expect Immediate Changes For US Reactor Fleet.

Media coverage of the nuclear crisis in Japan tended to focus on events on the ground in Japan rather than the debate over the future of the US nuclear industry. With Libya dominating the airwaves, the story still generated at a total of about seven minutes of coverage on the network newscasts.

The New York Times (3/22, A8, Wald, 1.01M) reports NRC's Executive Director for Operations R. William Borchardt "said Monday that the nuclear crisis in Japan did not warrant any immediate changes at American nuclear plants," though

he said the resident inspectors "at each site have been told to double-check that emergency equipment and precautions mandated years ago were still in place, including temporary hoses and fittings and other last-ditch backup equipment." In a briefing to the Commission, Borchardt said plant RIs were asked to ensure that plant operators knew where the equipment and materials were, and "make sure they haven't fallen into disuse because they haven't been used."

The AP (3/22, Daly) reports that while the crisis at Fukushima Dai-ichi plant in Japan remains severe, events there appear "to be stabilizing" and no immediate changes are warranted at US nuclear plants sites, Borchardt said, adding "officials have 'a high degree of confidence' that operations at the 104 nuclear reactors in 31 states are safe."

During his presentation, "Borchardt told commissioners that Units 1, 2 and 3" have "some core damage, but that containment for those three reactors has not been breached. 'I would say optimistically that things appear to be on the verge of stabilizing,' he said."

Politico (3/22, Dixon, 25K) notes that the long-term "review will include other federal agencies, including the Federal Emergency Management Agency, Borchardt said." Borchardt "assured the commission that the US has had a Mark 1 containment improvement program since the 1980s, a program he wasn't sure the Japanese had in place. One component of the improvement program required a more robust venting system that would have prevented the buildup of hydrogen that is believed to have caused explosions at several Fukushima reactor buildings."

Greenwire (3/22, Northey) reports that Bill Borchardt said the "NRC is now struggling to ascertain if Units 1, 2 and 3 have experienced core damage," and he added, "Today, all three units appear to be in a stable condition with seawater injection being used to keep the reactors cool." The NRC "has sent at least 11 experts to Japan to gather information and consult with Japanese officials."

Reuters (3/22, Rascoe, Gardner) reports that as the NRC considers enhanced inspections to verify plant operators are complying with rules regarding loss of safety systems and power, Bill Borchardt said, "We would evaluate whether or not some regulatory action ... would be required in order to require the licensees to take some actions that they have not already done."

Jaczkowski Promises "Methodical" Examination Of Japan's Nuclear Accident. In an abbreviated version of its coverage, the AP (3/22, Daly) notes that in the wake of the Fukushima crisis, "NRC Chairman Gregory Jaczkowski said the agency was likely to perform a short-term review of existing nuclear reactors, 'and then probably a much longer look' based on information from Japan." The Chairman "promised a 'methodical' examination of the accident at the Fukushima Dai-ichi plant and a thorough review of US practices going forward."

NRC Likely To Approve Review Of Fukushima Nuclear Plant Incident. On its website, CNN (3/22, Ahlers) says the NRC was "poised Monday to begin a 90-day review of Japan's nuclear crisis -- including a 30-day 'quick look' -- so that any lessons learned could quickly be applied to the 104 commercial reactors" in the US. The NRC met for the first time since the earthquake and tsunami, and NRC staffers "assured the five-member body they had 'a high degree of confidence' in existing safeguards at US nuclear power plants." But the staff also "suggested both near-term and long-term reviews of problems that have plagued the Japanese reactors." CNN notes that the results of the investigations will be made public.

Policymakers Eye Jaczkowski's Handling Of Fukushima Plant Information. Bloomberg News (3/22, Efstathiou, Lomax) runs a profile of NRC Chairman Jaczkowski, reporting that investors seeking "direction on the potential severity of Japan's nuclear crisis got it" from the Jaczkowski, who told lawmakers March 16 that the NRC thought "secondary containment has been destroyed and there is no water in the spent-fuel pool," and said, "We believe that radiation levels are extremely high." Bloomberg says stocks fell from the US to Russia, and "investments cited Jaczkowski's remarks." Japan's nuclear crisis has thrust the NRC "into the spotlight" and "policy makers and financial markets alike are listening" to Jaczkowski, "a 40- year-old native of upstate New York who associates say has been one of the most aggressive advocates of nuclear safety on the five-member commission."

Coakley Wants NRC To Reopen Spent Fuel Storage Rules. The AP (3/22) reports Massachusetts Attorney General Martha Coakley wants the federal government to "re-examine the safety of the wet storage of spent fuel at nuclear power plants, including the Pilgrim Nuclear Power Station in Plymouth." In a letter to NRC Chairman Gregory Jaczkowski and DOE Secretary Steven Chu, "Coakley said federal regulators need to take another look at the wet storage protocol," and "rescind their finding" that wet storage of spent fuel rods "doesn't create an environmental risk, given the problems at the Japan nuclear power plant in the wake of an earthquake and tsunami." Coakley wrote that the "NRC has refused" to consider alternative storing techniques, despite the group's "continuous advocacy."

Indian Point Owners Expect New NRC Regulations. The New York Times (3/22, A23, McGeehan, 1.01M) reports, "The operators of the Indian Point nuclear power plant said Monday that they did not expect ever to face the combination of earthquake and flooding that devastated Japan this month. But in the aftermath of those disasters, they said, some regulatory changes were to be expected." Entergy executives "told the Westchester County Board of Legislators' Environmental and Energy Committee at a meeting here that it was too soon to know what should be done differently at the plant. They said they did not foresee a natural disaster of the same magnitude in the New York area; the plant is on the Hudson River in Buchanan, 35 miles north of Midtown." The Entergy officials "said they had been storing spent fuel rods in 10 'dry casks' on concrete pads," which they said, "were designed to withstand...an earthquake of magnitude 6.0 on the Richter scale, the same level, they said, that the plant could handle."

US Nuclear Fleet Safety Has Improved In Recent Years. ClimateWire (3/22, Behr) reports on

Chairman Jaczko's appearance last week before "anxious, impatient senators" at a congressional hearing on the nuclear accident in Japan. Jaczko told lawmakers US nuclear reactors are safe, but he "could give no other answer – an unsafe reactor would have to be shut down and fixed, or closed." The country's "104 US commercial nuclear reactors have significantly improved their operating reliability and are more closely watched by on-site NRC inspectors and regional staff than in any other time in the industry's half-century history, according to NRC." The "median measure of nuclear plant outage time and power reductions from equipment failures and human error was 1.2 percent in 2009. The figure exceeded 5 percent in the mid-1990s, according to the industry's Nuclear Energy Institute."

Lochbaum Says US Plants Are Just As Vulnerable To Catastrophe.

Reuters (3/22, Zabarenko) reports that nuclear safety watchdog David Lochbaum, of the Union of Concerned Scientists, said that US reactors which share design feature with the stricken units at Japan's Fukushima Dai-ichi nuclear plant, would likely be vulnerable to a comparable disaster. Lochbaum said the spent fuel cooling system design was a main contributor to that vulnerability. "The arrangement with the spent fuel pool at upper elevations of the reactor building was a contributing factor, but the larger factors were the spent fuel cooling system was not designed to withstand earthquakes," said Lochbaum. Another problem, Lochbaum said, was that many supporting systems required electricity from the grid to function and "when these earthquakes and tsunami (in Japan) took out the normal power and the backup power...the pools were left with nothing that could cool the water," Lochbaum said.

Waxman Urges Step Back From Nuclear Expansion.

On its "Politics" page, US News & World Report (3/22, Rettig) says on its website, "Some lawmakers are urging the domestic nuclear industry to use the Japanese tragedy as a real-life lesson on safety." Among them, Rep. Henry Waxman noted the US has some plants of the same design as those at Fukushima Dai-ichi, and Japan, which is a "technologically capable country," was still unable "to stop this tragedy from occurring. So, we need a full inquiry as to how this happened, why it happened, what we can do to build in security features in the United States. Until that happens, we ought to step back from the direction that Republicans are taking, which is heavily reliant on nuclear."

Platts (3/22) adds that the "events at the Fukushima-1 plant already rank as the worst nuclear incident in the world since the Chernobyl disaster in what is now Ukraine in 1986, and have renewed public fears about the safety of nuclear power." They come "at a critical time for the industry, with governments in most of the world's biggest economies

looking to build new nuclear power plants as they seek to build new baseload generation capacity without increasing carbon emissions."

NRC To Host Meetings On Indian Point, Robinson Plants.

Greenwire (3/22, Northey) reports, NRC regulators will "discuss the safety" of Entergy's "Indian Point Power Plant," near "New York City, and Progress Energy Inc.'s H.B. Robinson Nuclear Plant, near Hartsville, S.C." New York Gov. Andrew Cuomo, and Attorney General Eric Schneiderman "last week called for NRC to take into account seismic activity in the region before relicensing the 40-year-old Indian River plant." In South Carolina, the NRC "is holding a separate meeting" to discuss the Robinson nuclear plant. The agency says the "single-unit 710-megawatt pressurized-water reactor operated safely last year, but the NRC staff is increasing its oversight and inspection there because the facility exceeded the threshold for unplanned shutdowns in the third quarter." Inspectors also found violations of "'low to moderate safety significance' including Progress Energy's failure to correct a problem with an emergency diesel generator and failure to adequately design and start operator training associated with reactor coolant pump seals."

NRC Issues License Renewal For Vermont Yankee Plant.

The AP (3/22) reports that NRC "regulators on Monday gave the Vermont Yankee nuclear plant a 20-year license renewal, despite calls for reconsideration following the nuclear disaster in Japan. Issuance of the license was a foregone conclusion after the NRC voted to approve it on March 10," a day before the earthquake and tsunami that struck Japan and triggered the crisis at the Fukushima plant. "Vermont Yankee spokesman Larry Smith said officials there and with the plant's parent company, New Orleans-based Entergy Corp., were pleased to have the license in hand. But he added, 'It's not a cause right now for any celebration in light of world events.'"

In a slightly different version, the AP (3/22, Gram) notes that Sen. Bernie Sanders had "issued a statement Sunday calling for a moratorium on new licenses or license renewals" following the Japanese nuclear plant crisis. "'It's hard to understand how the NRC could move forward for a license extension for Vermont Yankee at exactly the same time as a nuclear reactor of similar design is in partial meltdown in Japan,' Sanders told The Associated Press."

The Brattleboro (VT) Reformer (3/22) adds the "Independent Advisory Committee on Reactor Safeguards" reviewed "the proposal during meetings in 2007 and 2008. Then, on March 10, the Commission addressed the last remaining contention in the hearing process on the

application, when it dismissed an appeal from the New England Coalition."

The Boston Globe (3/22, Daley, 253K) reports, "The NRC had instructed its staff to issue the renewal the day before the Japanese earthquake and tsunami but then placed a hold on the license because agency staff were too busy aiding Japan. Opponents of the Vernon reactor near the Massachusetts border hoped the pause would translate into a deeper review of the plant, which has the same design as the crippled Fukushima Daiichi nuclear facility in Japan that has released radioactive material." Vermont Gov. Peter Shumlin said the NRC's license issue was "puzzling" and added, "Fortunately, Vermont has taken steps to close down the aging Yankee plant, and I have urged other states with older nuclear facilities to follow our example and take control of the lifespan of their plants." Also covering the NRC relicensing were the Wall Street Journal (3/22, Malik, 2.09M), New Orleans Times-Picayune (3/22, Tilove, 158K), Vermont Public Radio (3/22, Dillon) and Burlington (VT) Free Press (3/22, Connell, 34K).

Vermont Lawmakers Consider Impact Of Maine Yankee's Closing. On its website, WCAX-TV Burlington, Vermont (3/18, Carlson) reported that "Marge Kilkelly came to Montpelier from Maine with a message about the impacts of closing a nuclear power plant. 'The whole fabric of the community was impacted by this change. It was very sad and mournful,' said Kilkelly, of the Citizens Advisory Panel decommissioning Maine Yankee." Kilkelly, a former Maine senator, spoke to Vermont senators who are considering the economic impacts of Vermont Yankee plant's expected shuttering next year. Sen. Peter Galbraith said Windham County would face the same problems that Wiscasset, Maine faced when its plant closed. Maine Yankee used to provide 90 percent of the town's tax base. Current Wiscasset Select Board member Bob Blagden said "the town lost its tax base, had to cut its police force and raise taxes on residents, even as people moved out."

On its website, WCAX-TV Burlington, Vermont (3/21) reported, Vermont House Minority Leader Don Turner told Channel 3, "I don't think Vermonters understand the full financial impact of that facility. We're starting to see it this week. We'll be talking about an energy bill that came out of the House Energy Committee late last week that has a 55-cent increase in rates for all utility users, so that's just the start I think."

Entergy Eyes Cutting Funds For Pilgrim Plant Emergency Training. The Taunton (MA) Gazette (3/21, Downing, 8K) reported that once a quarter, the "Taunton Emergency Management Agency trains about 200 volunteers how to handle people fleeing a potential disaster at the Pilgrim nuclear power plant in Plymouth." Volunteers are

taught how to "run equipment to check people for radioactive contamination, direct them to showers, dispose of their clothing, get them into white paper suits and give them potassium iodide – scenes being played out for real every day with the failure of the Fukushima Dai-ichi plant in Japan." Until now, the \$5,000 cost of each training session has been covered by Entergy Corp., Pilgrim's parent company, with payments directly to the volunteers. "But the three communities that would act as 'reception centers' for people fleeing a disaster in Plymouth – Taunton, Bridgewater and Braintree – complain that Entergy wants to reduce the amounts they receive under their contracts and have them use those same funds to pay for volunteer training."

New Reactor Designs Will Make Use Of "Passive" Backup Cooling Features. The Kansas City Star (3/20, Everly, Davis, 233K) reported that even since the earliest design versions, nuclear reactors have "relied on electric pumps to bathe hot fuel rods with cooling water to prevent a dangerous meltdown. And if a power outage knocked out those pumps, backup generators would kick in to get them running again." But at Fukushima Dai-ichi, that backup system failed as well. Nuclear engineers say there is a better way to build a plant. "But even as debate rages about the future of nuclear energy, a new generation of inherently safer nuclear plants is coming on line now," the main feature of "the new generation is a so-called passive backup cooling system that would keep reactors safe if electricity were cut off. These systems rely on gravity, temperature-sensitive valves and natural convection currents to move water through a reactor."

Paper Favors Continued Use Of Nuclear Power. In an editorial supporting continued use of nuclear power, the Manitowoc (WI) Herald Times Reporter (3/22, 13K) said that while nuclear safety "is on everyone's mind" and naturally, comparisons will be made between the nuclear industry and oversight agencies of both Japan and the US. "The inevitable question arises: Could what happened in Japan happen here? The answer is yes." But, those "in the nuclear industry said reassuring things following the Japan disaster. Viktoria Mitlyng of the US Nuclear Regulatory Commission said the Kewaunee and Point Beach nuclear plants were made to survive the worst natural disasters on record." The Times Herald concludes, "We hope that nuclear power, with ongoing and thorough oversight, will continue to be part of the nation's energy landscape for many years to come."

NRC, Dresden Officials Confident In Plant's Safety Systems. The Morris (IL) Daily Herald (3/22, Hustis, 8K) examines the question of whether a Fukushima-

type accident could happen in "areas such as Grundy County, where residents have three generating stations as neighbors. ... Dresden has experienced earthquakes in the past, although not to the magnitude the Fukushima reactors were met with last Friday." But still, Dresden site communications coordinator Bob Osgood said, "We've had earthquakes before, but we've found no damage to our equipment," and added, "We're operating safely, our neighbors are safe, and these plants are equipped with numerous and redundant safety systems." Most areas are "potentially susceptible to earthquakes, Region 3 Nuclear Regulatory Commission spokesman Viktoria Mytling of Lisle noted. 'Nuclear plants are built to withstand earthquakes and other natural phenomenon to the highest known level for the area, plus an extra margin,' she said Tuesday."

California Lawmakers Seek Detailed Seismic Studies For Nuclear Plants. The AP (3/22) reports, "State lawmakers called on California utilities Monday to delay efforts to relicense nuclear power plants until the companies complete detailed seismic maps to get a true picture of the risks posed by earthquakes and tsunamis." According to AP, "State senators raised sharp questions about whether California's nuclear plants can withstand a major natural disaster such as the one on March 11 that has left Japan scrambling to control radiation coming from some of its reactors." Notably, "lawmakers also questioned whether the utilities have been dragging their feet on conducting three-dimensional seismic studies called for in a 2008 state report to assess the risks posed by offshore faults."

The Ventura County (CA) Star (3/22, Herdt) reports that "a state senator on Monday accused the operator of the Diablo Canyon nuclear power plant of operating under 'a culture of disregard of risk' and asked Pacific Gas & Electric Co. to suspend or withdraw its application for license renewal until the company has completed advanced seismic studies requested by state regulators three years ago." Sen. Sam Blakeslee, R-San Luis Obispo, "a geophysicist whose district includes the site of the nuclear plant, said PG&E has consistently downplayed the risks associated with the discovery of an offshore earthquake fault line in 2008," the paper adds.

Expert Says Nuclear Accident At Diablo Canyon May Sicken, Kill Over 1 Million. California's Bay Citizen (3/22, Upton) reports that "under intense questioning during a Senate informational hearing on earthquake preparedness Monday, PG&E's Geosciences Department Director Lloyd Cluff acknowledged that uncertainties about earthquakes near the [Diablo Canyon] exist, but said, 'We don't see a concern about the uncertainty.'" Daniel Hirsch, a nuclear policy lecturer at the University of California, Santa Cruz, said

that "a nuclear accident at the facility could sicken or kill more than 1 million people."

NRC Inspects Ameren Callaway Nuclear Plant.

The St. Louis Post-Dispatch (3/22, Tomich) reports, "Federal regulators have begun a special inspection at Ameren Missouri's Callaway nuclear plant after indications that a water pump used to help cool a key plant component in the event of an accident may not work properly." The paper says NRC "inspectors began their work today, and will probe circumstances surrounding an oil sample taken on Feb. 8 that suggested the pump may have been inadequately lubricated."

An Ameren spokesman says the inspection is unrelated to heightened concerns at nuclear plants following the damage to the plant in Japan, reports the AP (3/22).

South Texas Project Scales Back Expansion In View Of Japan Disaster.

The San Antonio Express-News (3/22, Hamilton) reports, "Nuclear Innovation North America announced Monday that it is slowing down development of two additional nuclear reactors at the South Texas Project to give federal regulators and others time to assess the state of the industry in the wake of Japan's nuclear disaster." In a press release, NINA, "the nuclear development company owned by NRG Energy and Toshiba Corp.," said "work on the proposed reactors will be limited to licensing and securing the US loan guarantee."

"Meanwhile, CPS Energy officials on Monday released a statement that San Antonio's municipally owned utility has decided to suspend discussions indefinitely with NRG Energy with respect to buying additional supplies of nuclear power from the South Texas Project," reports the San Antonio (TX) Business Journal (3/22). "As we have indicated for months now, we are currently pursuing an array of other clean affordable supply options. Terminating discussions with NRG allows us to devote more resources in pursuit of the other options," says CPS Energy head Doyle Beneby.

Arizona Corporation Commission Plans Safety Hearing.

The AP (3/21) reported that the Arizona Corporation Commission plans "a public hearing with operators of the nation's largest nuclear power plant to assess safety procedures in the wake of Japan's nuclear catastrophe." According to AP, "the triple-reactor Palo Verde Nuclear Generating Station is located in Wintersburg, about 50 miles west of downtown Phoenix." Notably, the NRC has proposed reviewing "the safety procedures at Palo Verde and at other US nuclear plants" following the Japan nuclear issue. The Phoenix Business Journal (3/22) also covers the news.

Scrutiny Turns To Planning For Nuclear Crisis.

The Chicago Tribune (3/20, Wernau, Black, 488K) reports,

"Fourteen years ago, Zion nuclear power plant's last red-hot fuel rod was lifted from its reactor core and submerged into a pool of water, joining the rest of the plant's 2.2 million pounds of spent fuel." The material was supposed to go to Yucca Mountain, but when the Obama Administration canceled the deep geologic repository, Zion plant operators and crews from more than 100 nuclear reactors in the US were left "with the responsibility for storing on site the dangerous spent fuel." In the "wake of Japan's disaster, the safety calculation involved in storing such waste has changed, experts say." Kennette Benedict of the Bulletin of the Atomic Scientists said Friday that the problems in Japan came after a "once-in-a-millennium [earthquake] event – but we don't plan for those."

Nuclear Reactor Safety Coverage Continues. In continuing coverage of the impact of the nuclear crisis in Japan and its impact on the nuclear power industry in the United States, Virginia Business Magazine (3/22, Squires) reports, Virginia "has two nuclear plants in Louisa and Surry counties." Dominion "has applied to build a third nuclear reactor at its Lake Anna Power Station in Louisa." Dominion's Jim Norvelle said, "We don't have an equity partner yet. We want to keep the option open to meet future demand." The power company expects the NRC "to rule on its application in 2013." According to Norvelle, "Then it becomes a business decision, and we'll have to decide if we want to go through with it."

A blog on the Fredericksburg Free Lance Star (3/21, Dennen) reports, "As the nuclear disaster in Japan continues, the Nuclear Regulatory Commission put out a Q&A addressing seismic issues at US nuclear power plants." The NRC "says it does not rank individual plants' risk of damage in an earthquake after an MSNBC story last week used NRC data to compile such a rating." According to the agency the rankings are "highly misleading." The blog adds, "The MSNBC story listed the North Anna Units 1 and 2 as 7th out of the top 10 plants most likely to have reactor core damage in an earthquake."

An article titled "Japanese Reactors Are Similar Yet Different From Those In Virginia" the Newport News Daily Press (3/22, Nealon) issues a bit of a correction to an article that they printed last week about "the likelihood of a commercial nuclear power plant failure in Virginia." The Daily Press adds, "The article states while the Japanese reactors are about the same age as the reactors at Surry Power Station, the 'similarities end there.'" However, "there are additional similarities. Both type of reactors are powered by enriched uranium, and both rely on large amounts of water and complex electrical systems to prevent the release of dangerous amounts of radiation." Despite the similarities the article points out that the chances for an accident similar to the one that is happening in Japan "are slim."

Dominion's David Christian told WISN-TV Milwaukee (3/21, 11:35 p.m. EST) that the industry is "making preparations if disaster strikes." Christian said, "We have procedures in place, equipment in place, to deal with the unexpected." Managing editor of the Journal Inquirer (3/22) Chris Powell writes that there is "a big spent fuel pool at the Millstone nuclear power complex in Waterford" calling it "by far the biggest environmental hazard in Connecticut."

Barron Touts Constellation's Commitment To Safety. In response to nuclear crisis happening in Japan, Brew Barron, president and CEO of Constellation Energy Nuclear Group, writes in a piece appearing in the Baltimore Sun (3/22, Barron, 228K), that CENG extends "our sincere sympathies to those suffering due to the tragic earthquake and tsunami." Barron goes on to say that safety is a "passion" at CENG and that the company agrees "a fresh review of the industry, with a focus on protective actions in the event of unusual natural events, is appropriate." He concludes, "Rest assured, we will maintain our unwavering commitment to safety and our staunch support for the continuous application of lessons learned."

Some environmental groups have concerns about all NY nuclear plants. On its website, WRVO Radio (3/22, Benjamin) reports, "In the wake of the nuclear crisis in Japan, Lieutenant Governor Robert Duffy is meeting with Nuclear Regulatory Commission officials tomorrow to discuss concerns over the safety of the Indian Point nuclear power plant near New York City." Several "environmental advocacy groups are sending a letter to Governor Andrew Cuomo, urging his administration to go further and discuss concerns at all the state's nuclear facilities, including the three in Oswego County (Nine Mile Point 1, Nine Mile Point 2, and FitzPatrick) and one in Wayne County (Ginna)." WRVO notes, "Two of the plants in Oswego County (Nine Mile Point 1 and FitzPatrick) also have the same model boiling water reactor and containment design as the Fukushima plant in Japan that experienced a near-meltdown after the earthquake and tsunami that hit that country recently."

Exelon Bracing For Costs Of Expected Plant Upgrades. Crain's Chicago Business (3/21, Daniels, 45K) predicts that "fallout" from the Fukushima plant disaster "is headed straight for" Exelon Corp. The "biggest nuclear plant operator in the United States" will "bear the full force of an expected crackdown by regulators spurred to action by uncontrolled radiation releases across the Pacific." Exelon CEO John Rowe said "he expected the Nuclear Regulatory Commission to perform special safety reviews of all the nation's nukes—something Mr. Obama later ordered." Crain's adds, "Improvements to backup power systems might be expected in the wake of their failure in Japan, but costs of

that sort would be on the lower end, experts say. Bigger-ticket upgrades could include shoring up pools where spent fuel rods are stored at the plant sites," and of course, "if the Japanese containment vessels fail, prompting the NRC to seek major upgrades of US plant vessels, then costs could skyrocket."

Florida Utility Eyeing Santee Cooper's Share Of New VC Summer Units. The Myrtle Beach Sun News (3/22, Wise) reports, "A Florida utility plans to buy into Santee Cooper's share of two new nuclear units to be built north of Columbia amid the uncertainties for the industry following the disaster in Japan." On Monday, Santee Cooper said that it had "signed a letter of intent to negotiate a purchase power agreement with Orlando Utilities Commission for a portion of the state-owned company's stake in the planned \$10 billion new reactors at V.C. Summer Nuclear Generating Station in Fairfield County." OUC "also could buy part of Santee Cooper's ownership in the joint venture."

NextEra Expresses Support For Nuclear Power. The Palm Beach Post (3/22, Salisbury) reports, "NextEra Energy Inc., the Juno Beach-based parent company of Florida Power & Light Co., is a major producer of the power source that has been thrust to the front and center since the catastrophe in Japan." On Monday, NextEra Energy CEO Lewis Hay said that they are the "nation's third-largest owner and operator of nuclear power plants." Hay said, "The nuclear industry is a unique industry. We all pull together and help one another out." He added that the industry will learn lessons from the incident and incorporate them "operating procedures and plant design."

Nine Mile Point Unit 1 Shutdown For Refueling. The Syracuse Post Standard (3/22, Groom) reports, "Nine Mile Point Unit 1 nuclear plant has been shut down for scheduled refueling and maintenance, said Jill Lyon, speaking for Constellation Nuclear Energy Group, the plant's owner." According to Lyon "the plant is taken offline every 24 months to refuel the reactor and perform normal maintenance work and inspections." Reuters (3/22) is also covering this story.

Judge Dismisses Challenge Of Nuclear Plant Tax Agreement. The Syracuse Post Standard (3/22, Groom) reports, "The petition filed by the Oswego school district challenging the tax agreement with Nine Mile Point Unit 1 has been dismissed in state Supreme Court." Justice Hugh Gilbert has "dismissed the school district's petition stating it should not have been filed as a challenge to the assessment set by the Scriba Board of Assessment Review." Gilbert adds "the assessment only can be challenged in a tax

grievance petition" and "also ruled the school district cannot use this procedure to challenge the assessment because only the property owner can file a tax grievance." YNN News (3/22) is also covering this story.

Connecticut Legislature Considering Tax On Oil, Coal, Nuclear Generators. The AP (3/22) reports the Connecticut "legislature's Energy and Technology Committee is scheduled to meet Tuesday to consider the bill, which would impose a tax on generators that use oil, coal and nuclear power." According to the state Office of Consumer Counsel "the tax would raise \$340 million in revenue, with \$332 million from Connecticut's Millstone nuclear plants." Dominion "says the tax will raise prices for consumers" and that "the measure is discriminatory because it is applied to only a few energy sources."

Secretary Chu Cancels Trip To Brazil To Focus On Japanese Nuclear Crisis. The Washington Post (3/22, O'Keefe, 605K) "Federal Eye" blog reports that "eight Cabinet secretaries and top officials from other agencies are along for the ride," as President Obama travels through Latin American. The article explains, though, that "Energy Secretary Steven Chu was also scheduled for the trip, but canceled to focus on the US response to the Japanese earthquake, according to the White House. Interior Secretary Ken Salazar is also scheduled to visit Brazil in the coming weeks to follow up on energy-related topics discussed during Obama's trip."

Rep. Shimkus Questions Legality Of Closing Yucca. E&E Daily (3/18, Northey) reported that Rep. John Shimkus (R-Ill.), chairman of a House Energy and Commerce subcommittee, "is challenging whether the Nuclear Regulatory Commission had the legal authority to suspend a safety review of Yucca Mountain in Nevada as a permanent spent nuclear fuel repository." Mr. Shimkus "warned NRC Chairman Gregory Jaczko during a budgetary hearing Wednesday that 'you better be double checking your facts' on whether the move was legal." Shimkus said "it is 'a stated federal position by law that Yucca Mountain should be open, that's the legal authority; there's no legal authority to close Yucca Mountain.'"

Greenspun Faults Plan To Push Ahead With Yucca. In a Las Vegas Sun (3/20, 41K) column, Brian Greenspun wrote that in the wake of the earthquakes and tsunamis in Japan, his column was "an attempt to separate the politics of money from the policies of good government and sane stewardship of the environment and the right of the people to live secure in the belief that their government is not going to do them in." Greenspun adds, "At the heart of the Yucca Mountain debate is this: The federal government and the

Yucca support staff always believed it was responsible, reasonable and desirable to build a nuclear waste dump in the middle of the third most active earthquake zone in the country. And, deep geologic burial would take place in one of the most porous mountains around — that means water flows from its top through the nuke canisters, corroding them on the way through, and then into the water table below — and you have the makings of an environmental disaster.”

More Commentary. In an editorial, the Washington Times (3/22) says the “ongoing crisis at Japan’s damaged nuclear power plants raises the issue of whether our own radioactive materials are vulnerable to similar catastrophes. The states of South Carolina and Washington will argue today before the US Court of Appeals for the District of Columbia that the Obama administration had no authority to order the closing of the Yucca Mountain disposal facility in Nevada. ... President Obama fulfilled a campaign promise to his radical supporters by zeroing out funding for Yucca Mountain in his fiscal 2011 budget last year.” Given Japan’s recent tragedy, “lawmakers ought to persuade the administration to reconsider its position on nuclear waste disposal.”

Federal Court To Hear States’ Arguments For Yucca Project. The Augusta (GA) Chronicle (3/22, Pavey) reports the DC Circuit Court of Appeals will hear oral arguments in the lawsuit filed by South Carolina, Aiken County, Washington state, and three of its citizens seeking to force the federal government to complete the Yucca Mountain nuclear waste repository. South Carolina Attorney General’s Office communications director Mark Plowden said, “In this case, existing law is very clear that Congress has mandated that the nation’s high level nuclear waste shall be stored at the Yucca Mountain facility in Nevada,” adding, “All of the states are in agreement, with the exception of Nevada.”

Politics To Blame For Lack Of Nuclear Repository, Columnist Says. Dennis Byrne writes in a column for the Chicago Tribune (3/22, 488K) that “thanks to Sen. Harry Reid (D-NV), Democratic Presidents Bill Clinton and Barack Obama and anti-nuke champions, tens of thousands of tons of dangerously radioactive fuel rods have been ‘temporarily’ stored for up to 60 years on American nuclear power sites, many in Illinois. Many are stored like those in pools of water that are threatening to go dry at the damaged nuclear reactors in Japan.” And while “common sense and science dictate that spent fuel should be stored far away from the power plant, someplace permanent that wouldn’t magnify the consequences of a catastrophic accident,” it isn’t because of politics, according to Byrne, citing the debate over the completion of the Yucca waste repository.

Vitamin Pill Helps Astronaut Deal With Radiation. Discovery News (3.22, Klotz) reports, “To

mitigate the effects of radiation on astronauts, doctors advise a simple measure: Take a vitamin pill.” Ann Kennedy, head of the National Space Biomedical Research Institute Radiation Effects Team, said a vitamin pill can “greatly modify the radiation response” and recommends it to astronauts aboard the International Space Station as well as anyone near the troubled nuclear reactor in Japan. Marcelo Vazquez of the NASA Space Radiation Laboratory said, “Workers now at the plant – (who) are apparently receiving high doses of radiation and they are not very well protected – could be in a similar range (of exposure) to those that an astronaut will encounter during a solar particle event.”

Facts About NRC Considered. US News and World Report (3/22, Huey) runs a list of “10 Things You Didn’t Know” about the NRC. Number 3 says the “commission is designed to be an independent regulator of nuclear material and nuclear power used commercially.” Number 5 says the “NRC is made up of five commissioners, nominated by the president and confirmed by the Senate to serve staggered five-year terms. No more than three commissioners can be from the same political party.”

INTERNATIONAL NUCLEAR NEWS:

700 Workers Evacuated From Fukushima Plant Monday. The CBS Evening News (3/21, story 4, 2:50, Couric, 6.1M) reported, “It’s a sign this crisis is far from under control. Ten days after the Fukushima Daiichi nuclear plant was knocked out by Japan’s massive earthquake and tsunami and once again reactor three is spewing smoke a few hours later white smoke from reactor two. It’s a mysterious and serious setback, one that prompted workers to evacuate and once again stopped efforts to stabilize the plant. ... Today’s smoking reactors have engineers baffled.”

NBC Nightly News (3/21, story 8, 1:50, Williams, 8.37M) added, “In another setback in the efforts to contain the crippled reactors, engineers have discovered that some of the pumps are damaged beyond repair. They won’t be able to restart them any time soon. ... Despite those setbacks, officials with the US Nuclear Regulatory Commission emphasize sea water is now reaching all of the troubled reactors and attempts to restore power continue.” Bill Borchardt, NRC: “I would say optimistically things appear to be on the verge of stabilizing.”

The Washington Post (3/22, Nakamura, Achenbach, 605K) reports, “Emergency workers lost precious hours Monday in their ongoing battle to get the six-reactor complex under control when smoke billowed from two of the reactor units. ... No one was hurt, and the incidents were not as

alarming as three previous explosions that damaged buildings housing reactors," but "radiation levels spiked briefly, and the Tokyo Electric Power Co. (Tepco) chose to evacuate about 700 workers."

The New York Times (3/22, A10, Belson, Tabuchi, Jolly, 1.01M) adds, "Efforts to stabilize the crippled nuclear power plant in Fukushima stalled on Monday when engineers found that crucial machinery at one reactor required repair, a process that will take two to three days, government officials said. ... Engineers were also trying to repair the ventilation system in the control room used to monitor conditions in the No. 1 and No. 2 units."

According to the Los Angeles Times (3/22, Lee, Kim, Glionna, 681K), "Some Japanese scientists said the problems didn't appear to signal a deteriorating situation at Fukushima, where workers had been making progress in the painstaking work to contain the nuclear crisis."

Despite yesterday's setbacks, Bloomberg News (3/22, Okada, Inajima) reports Japanese Prime Minister Naoto Kan "said he can see 'light at the end of the tunnel' even as smoke at two reactors hampered efforts to restore cooling systems." According to Bloomberg, "Kan's optimistic statements are the strongest yet from a Japanese official."

Radiation Plume Not Considered A Danger To Americans. According to the New York Times (3/22, Broad, 1.01M), "Harmless traces of radiation from the stricken nuclear complex in Japan have been detected wafting over the East Coast of the United States. ... Health experts said that the plume's radiation had been diluted enormously in its journey of thousands of miles and that -- at least for now, with concentrations so low -- its presence will have no health consequences in the United States."

Another article in the New York Times (3/22, Kopytoff, 1.01M) notes that "with small amounts of radiation from Japan's damaged reactors wafting across the Pacific Ocean, relief crews, businesses and ordinary consumers have bought nearly every Geiger counter available from the few retailers that sell them."

Radiation Levels Force US Carrier To Leave Japanese Port. The CBS Evening News (3/21, story 6, 1:35, Couric, 6.1M) reported, "The aircraft carrier George Washington was forced to leave its Japanese port over fears of radiation. ... The decision to send the George Washington to sea even though one of its nuclear reactors is down for repairs, came in response from a shift in the wind which is blowing increased amounts of radioactivity south over Tokyo toward the American bases at Yokosuka and Atsugi. The winds threatened to dump as much radioactivity in the next 24 hours as in the preceding ten days."

Work Continues To Restore Power To Stricken Fukushima Reactors. Platts (3/22, Dolley) reports, "Pressure levels rose then stabilized Sunday in one of the

crippled reactors at the Fukushima I nuclear power plant in Japan, government and industry officials said. Plans being considered earlier Sunday to vent radioactive steam from the reactor to reduce pressure were deferred and workers will continue to monitor reactor pressure, Tokyo Electric Power Co. said in a statement Sunday afternoon local time." Work continues to "restore outside electric power to instruments and safety systems at the site's six reactors and spent fuel pools." Sunday, "an external power cable had been connected to the 'distribution switchboards' at units 1 and 2" and efforts "were continuing to restore external power to units 3 and 4. Fuel is still 'partially or fully exposed' in units 1, 2 and 3, JAIF said, creating a risk of fuel damage, generation of explosive hydrogen gas and possible core melting."

EU Ministers Unable To Agree On New Inspections. The Wall Street Journal (3/22, Smith, Radowitz, 2.09M) reports that in a special session in Brussels yesterday to address the impact of the Japanese crisis on the nuclear energy industry, EU energy ministers were unable to reach an agreement on new tests for existing European nuclear plants.

Warnings Regarding Aging Reactors Went Unheeded. The New York Times (3/22, A1, Tabuchi, Onishi, Belson, 1.01M), in a front-page article titled, "Japan Extended Reactor's Life, Despite Warning," reports, "Just a month before a powerful earthquake and tsunami crippled the Fukushima Daiichi plant at the center of Japan's nuclear crisis, government regulators approved a 10-year extension for the oldest of the six reactors at the power station despite warnings about its safety. ... Several weeks after the extension was granted, the company admitted that it had failed to inspect 33 pieces of equipment related to the cooling systems, including water pumps and diesel generators, at the power station's six reactors, according to findings published on the agency's Web site shortly before the earthquake."

Death Toll Expected To Be More Than 18,000. ABC World News (3/21, story 5, 2:05, Sawyer, 8.2M) reported, "The death toll from the earthquake and tsunami is now expected to top 18,000."

Total Crisis Bill Could Be Three Times The Cost Of Katrina Cleanup. The Washington Post (3/22, Nakamura, Achenbach, 605K) reports that the World Bank estimates Japan "will face five years of rebuilding from the disaster, which could cost the nation up to \$235 billion." The Post notes Hurricane Katrina is thought to have "caused \$81.2 billion in damage."

The Wall Street Journal (3/22, Greil, Oster, Ng, 2.09M) says the firm Risk Management Solutions estimates the cost could eventually run as high as \$300 million.

Japanese Food Export Industry Threatened. The CBS Evening News (3/21, story 5, 1:35, Couric, 6.1M) reported, "The US, China, South Korea, and India have all stepped up their inspections of food exported by Japan,"

while Italy "has banned them all together. At stake for Japan, an export market worth \$5 billion a year. ... Some spinach samples taken south of Fukushima tested at more than seven times the illegal allowance of radioactive iodine. Seawater near the plant has tested 126 times higher than the legal limit."

ABC World News (3/21, story 4, 2:25, Sawyer, 8.2M) reported, "Tokyo tap water shows elevated levels of radioactive iodine and cesium. Milk, canola, spinach and other leafy vegetables farmed near the reactor are considered unsafe for human consumption. ... We have here an assortment of produce we brought at an ordinary Tokyo supermarket" marked "Fukushima fresh vegetables," and "if you take our trustee Geiger counter and hold it right up to the package it immediately starts to crackle."

The Washington Times (3/22, Johnson, 77K) notes that the World Health Organization "warned of contamination in farm products beyond the vicinity of the seaside nuclear reactors in Fukushima province." A WHO report "suggested that wind and rain has blown radioactive particles to the west and south far beyond Japan's 18-mile danger zone around the power plant."

Chileans Protest US Nuclear Deal Signed Friday.

The Christian Science Monitor (3/22, Bodzin, 48K) reports, "Among the 'urgent events' that President Obama said he discussed Monday with Chilean President Sebastián Piñera was the unfolding nuclear crisis in Japan. ... While the crisis only appeared to be mentioned in passing during a press conference in Santiago during Mr. Obama's five-day regional tour, it has set off a firestorm of criticism against Mr. Piñera and caused a major rethink over energy policy here. Yesterday, some 2,000 people marched through the capital to protest a new US-Chile nuclear power cooperation agreement signed Friday as radiation leaked from Japan's Fukushima nuclear plant."

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NUCLEAR REGULATORY COMMISSION NEWS SUMMARY

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TODAY'S EDITION

NRC News:

NRC Doesn't Expect Immediate Changes For US Reactor Fleet	1
Coakley Wants NRC To Reopen Spent Fuel Storage Rules	2
Indian Point Owners Expect New NRC Regulations	2
US Nuclear Fleet Safety Has Improved In Recent Years	2
Lochbaum Says US Plants Are Just As Vulnerable To Catastrophe	3
NRC To Host Meetings On Indian Point, Robinson Plants	3
NRC Issues License Renewal For Vermont Yankee Plant	3
Entergy Eyes Cutting Funds For Pilgrim Plant Emergency Training	4
New Reactor Designs Will Make Use Of "Passive" Backup Cooling Features	4
Paper Favors Continued Use Of Nuclear Power	4
NRC, Dresden Officials Confident In Plant's Safety Systems	4
California Lawmakers Seek Detailed Seismic Studies For Nuclear Plants	5
NRC Inspects Ameren Callaway Nuclear Plant	5
South Texas Project Scales Back Expansion In View Of Japan Disaster	5
Arizona Corporation Commission Plans Safety Hearing	5
Scrutiny Turns To Planning For Nuclear Crisis	5
Nuclear Reactor Safety Coverage Continues	6
Barron Touts Constellation's Commitment To Safety	6

Exelon Bracing For Costs Of Expected Plant Upgrades	6
Florida Utility Eyeing Santee Cooper's Share Of New VC Summer Units	7
NextEra Expresses Support For Nuclear Power	7
Nine Mile Point Unit 1 Shutdown For Refueling	7
Judge Dismisses Challenge Of Nuclear Plant Tax Agreement	7
Connecticut Legislature Considering Tax On Oil, Coal, Nuclear Generators	7
Secretary Chu Cancels Trip To Brazil To Focus On Japanese Nuclear Crisis	7
Rep. Shimkus Questions Legality Of Closing Yucca	7
Vitamin Pill Helps Astronaut Deal With Radiation	8
Facts About NRC Considered	8

International Nuclear News:

700 Workers Evacuated From Fukushima Plant Monday	8
Chileans Protest US Nuclear Deal Signed Friday	10

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NRC NEWS:

NRC Doesn't Expect Immediate Changes For US Reactor Fleet.

Media coverage of the nuclear crisis in Japan tended to focus on events on the ground in Japan rather than the debate over the future of the US nuclear industry. With Libya dominating the airwaves, the story still generated at a total of about seven minutes of coverage on the network newscasts.

The New York Times (3/22, A8, Wald, 1.01M) reports NRC's Executive Director for Operations R. William Borchardt "said Monday that the nuclear crisis in Japan did not warrant any immediate changes at American nuclear plants," though

he said the resident inspectors "at each site have been told to double-check that emergency equipment and precautions mandated years ago were still in place, including temporary hoses and fittings and other last-ditch backup equipment." In a briefing to the Commission, Borchardt said plant RIs were asked to ensure that plant operators knew where the equipment and materials were, and "make sure they haven't fallen into disuse because they haven't been used."

The AP (3/22, Daly) reports that while the crisis at Fukushima Dai-ichi plant in Japan remains severe, events there appear "to be stabilizing" and no immediate changes are warranted at US nuclear plants sites, Borchardt said, adding "officials have 'a high degree of confidence' that operations at the 104 nuclear reactors in 31 states are safe."

During his presentation, "Borchardt told commissioners that Units 1, 2 and 3" have "some core damage, but that containment for those three reactors has not been breached. 'I would say optimistically that things appear to be on the verge of stabilizing,' he said."

Politico (3/22, Dixon, 25K) notes that the long-term "review will include other federal agencies, including the Federal Emergency Management Agency, Borchardt said." Borchardt "assured the commission that the US has had a Mark 1 containment improvement program since the 1980s, a program he wasn't sure the Japanese had in place. One component of the improvement program required a more robust venting system that would have prevented the buildup of hydrogen that is believed to have caused explosions at several Fukushima reactor buildings."

Greenwire (3/22, Northey) reports that Bill Borchardt said the "NRC is now struggling to ascertain if Units 1, 2 and 3 have experienced core damage," and he added, "Today, all three units appear to be in a stable condition with seawater injection being used to keep the reactors cool." The NRC "has sent at least 11 experts to Japan to gather information and consult with Japanese officials."

Reuters (3/22, Rascoe, Gardner) reports that as the NRC considers enhanced inspections to verify plant operators are complying with rules regarding loss of safety systems and power, Bill Borchardt said, "We would evaluate whether or not some regulatory action ... would be required in order to require the licensees to take some actions that they have not already done."

Jaczkowski Promises "Methodical" Examination Of Japan's Nuclear Accident. In an abbreviated version of its coverage, the AP (3/22, Daly) notes that in the wake of the Fukushima crisis, "NRC Chairman Gregory Jaczkowski said the agency was likely to perform a short-term review of existing nuclear reactors, 'and then probably a much longer look' based on information from Japan." The Chairman "promised a 'methodical' examination of the accident at the Fukushima Dai-ichi plant and a thorough review of US practices going forward."

NRC Likely To Approve Review Of Fukushima Nuclear Plant Incident. On its website, CNN (3/22, Ahlers) says the NRC was "poised Monday to begin a 90-day review of Japan's nuclear crisis -- including a 30-day 'quick look' -- so that any lessons learned could quickly be applied to the 104 commercial reactors" in the US. The NRC met for the first time since the earthquake and tsunami, and NRC staffers "assured the five-member body they had 'a high degree of confidence' in existing safeguards at US nuclear power plants." But the staff also "suggested both near-term and long-term reviews of problems that have plagued the Japanese reactors." CNN notes that the results of the investigations will be made public.

Policymakers Eye Jaczkowski's Handling Of Fukushima Plant Information. Bloomberg News (3/22, Efstathiou, Lomax) runs a profile of NRC Chairman Jaczkowski, reporting that investors seeking "direction on the potential severity of Japan's nuclear crisis got it" from the Jaczkowski, who told lawmakers March 16 that the NRC thought "secondary containment has been destroyed and there is no water in the spent-fuel pool," and said, "We believe that radiation levels are extremely high." Bloomberg says stocks fell from the US to Russia, and "investments cited Jaczkowski's remarks." Japan's nuclear crisis has thrust the NRC "into the spotlight" and "policy makers and financial markets alike are listening" to Jaczkowski, "a 40- year-old native of upstate New York who associates say has been one of the most aggressive advocates of nuclear safety on the five-member commission."

Coakley Wants NRC To Reopen Spent Fuel Storage Rules. The AP (3/22) reports Massachusetts Attorney General Martha Coakley wants the federal government to "re-examine the safety of the wet storage of spent fuel at nuclear power plants, including the Pilgrim Nuclear Power Station in Plymouth." In a letter to NRC Chairman Gregory Jaczkowski and DOE Secretary Steven Chu, "Coakley said federal regulators need to take another look at the wet storage protocol," and "rescind their finding" that wet storage of spent fuel rods "doesn't create an environmental risk, given the problems at the Japan nuclear power plant in the wake of an earthquake and tsunami." Coakley wrote that the "NRC has refused" to consider alternative storing techniques, despite the group's "continuous advocacy."

Indian Point Owners Expect New NRC Regulations. The New York Times (3/22, A23, McGeehan, 1.01M) reports, "The operators of the Indian Point nuclear power plant said Monday that they did not expect ever to face the combination of earthquake and flooding that devastated Japan this month. But in the aftermath of those disasters, they said, some regulatory changes were to be expected." Entergy executives "told the Westchester County Board of Legislators' Environmental and Energy Committee at a meeting here that it was too soon to know what should be done differently at the plant. They said they did not foresee a natural disaster of the same magnitude in the New York area; the plant is on the Hudson River in Buchanan, 35 miles north of Midtown." The Entergy officials "said they had been storing spent fuel rods in 10 'dry casks' on concrete pads," which they said, "were designed to withstand...an earthquake of magnitude 6.0 on the Richter scale, the same level, they said, that the plant could handle."

US Nuclear Fleet Safety Has Improved In Recent Years. ClimateWire (3/22, Behr) reports on

Chairman Jaczko's appearance last week before "anxious, impatient senators" at a congressional hearing on the nuclear accident in Japan. Jaczko told lawmakers US nuclear reactors are safe, but he "could give no other answer -- an unsafe reactor would have to be shut down and fixed, or closed." The country's "104 US commercial nuclear reactors have significantly improved their operating reliability and are more closely watched by on-site NRC inspectors and regional staff than in any other time in the industry's half-century history, according to NRC." The "median measure of nuclear plant outage time and power reductions from equipment failures and human error was 1.2 percent in 2009. The figure exceeded 5 percent in the mid-1990s, according to the industry's Nuclear Energy Institute."

Lochbaum Says US Plants Are Just As Vulnerable To Catastrophe.

Reuters (3/22, Zabarenko) reports that nuclear safety watchdog David Lochbaum, of the Union of Concerned Scientists, said that US reactors which share design feature with the stricken units at Japan's Fukushima Dai-ichi nuclear plant, would likely be vulnerable to a comparable disaster. Lochbaum said the spent fuel cooling system design was a main contributor to that vulnerability. "The arrangement with the spent fuel pool at upper elevations of the reactor building was a contributing factor, but the larger factors were the spent fuel cooling system was not designed to withstand earthquakes," said Lochbaum. Another problem, Lochbaum said, was that many supporting systems required electricity from the grid to function and "when these earthquakes and tsunami (in Japan) took out the normal power and the backup power...the pools were left with nothing that could cool the water," Lochbaum said.

Waxman Urges Step Back From Nuclear Expansion.

On its "Politics" page, US News & World Report (3/22, Rettig) says on its website, "Some lawmakers are urging the domestic nuclear industry to use the Japanese tragedy as a real-life lesson on safety." Among them, Rep. Henry Waxman noted the US has some plants of the same design as those at Fukushima Dai-ichi, and Japan, which is a "technologically capable country," was still unable "to stop this tragedy from occurring. So, we need a full inquiry as to how this happened, why it happened, what we can do to build in security features in the United States. Until that happens, we ought to step back from the direction that Republicans are taking, which is heavily reliant on nuclear."

Platts (3/22) adds that the "events at the Fukushima-1 plant already rank as the worst nuclear incident in the world since the Chernobyl disaster in what is now Ukraine in 1986, and have renewed public fears about the safety of nuclear power." They come "at a critical time for the industry, with governments in most of the world's biggest economies

looking to build new nuclear power plants as they seek to build new baseload generation capacity without increasing carbon emissions."

NRC To Host Meetings On Indian Point, Robinson Plants.

Greenwire (3/22, Northey) reports, NRC regulators will "discuss the safety" of Entergy's "Indian Point Power Plant," near "New York City, and Progress Energy Inc.'s H.B. Robinson Nuclear Plant, near Hartsville, S.C." New York Gov. Andrew Cuomo, and Attorney General Eric Schneiderman "last week called for NRC to take into account seismic activity in the region before relicensing the 40-year-old Indian River plant." In South Carolina, the NRC "is holding a separate meeting" to discuss the Robinson nuclear plant. The agency says the "single-unit 710-megawatt pressurized-water reactor operated safely last year, but the NRC staff is increasing its oversight and inspection there because the facility exceeded the threshold for unplanned shutdowns in the third quarter." Inspectors also found violations of "'low to moderate safety significance' including Progress Energy's failure to correct a problem with an emergency diesel generator and failure to adequately design and start operator training associated with reactor coolant pump seals."

NRC Issues License Renewal For Vermont Yankee Plant.

The AP (3/22) reports that NRC "regulators on Monday gave the Vermont Yankee nuclear plant a 20-year license renewal, despite calls for reconsideration following the nuclear disaster in Japan. Issuance of the license was a foregone conclusion after the NRC voted to approve it on March 10," a day before the earthquake and tsunami that struck Japan and triggered the crisis at the Fukushima plant. "Vermont Yankee spokesman Larry Smith said officials there and with the plant's parent company, New Orleans-based Entergy Corp., were pleased to have the license in hand. But he added, 'It's not a cause right now for any celebration in light of world events.'"

In a slightly different version, the AP (3/22, Gram) notes that Sen. Bernie Sanders had "issued a statement Sunday calling for a moratorium on new licenses or license renewals" following the Japanese nuclear plant crisis. "It's hard to understand how the NRC could move forward for a license extension for Vermont Yankee at exactly the same time as a nuclear reactor of similar design is in partial meltdown in Japan," Sanders told The Associated Press."

The Brattleboro (VT) Reformer (3/22) adds the "independent Advisory Committee on Reactor Safeguards" reviewed "the proposal during meetings in 2007 and 2008. Then, on March 10, the Commission addressed the last remaining contention in the hearing process on the

application, when it dismissed an appeal from the New England Coalition."

The Boston Globe (3/22, Daley, 253K) reports, "The NRC had instructed its staff to issue the renewal the day before the Japanese earthquake and tsunami but then placed a hold on the license because agency staff were too busy aiding Japan. Opponents of the Vernon reactor near the Massachusetts border hoped the pause would translate into a deeper review of the plant, which has the same design as the crippled Fukushima Daiichi nuclear facility in Japan that has released radioactive material." Vermont Gov. Peter Shumlin said the NRC's license issue was "puzzling" and added, "Fortunately, Vermont has taken steps to close down the aging Yankee plant, and I have urged other states with older nuclear facilities to follow our example and take control of the lifespan of their plants." Also covering the NRC relicensing were the Wall Street Journal (3/22, Malik, 2.09M), New Orleans Times-Picayune (3/22, Tilove, 158K), Vermont Public Radio (3/22, Dillon) and Burlington (VT) Free Press (3/22, Connell, 34K).

Vermont Lawmakers Consider Impact Of Maine Yankee's Closing. On its website, WCAX-TV Burlington, Vermont (3/18, Carlson) reported that "Marge Kilkelly came to Montpelier from Maine with a message about the impacts of closing a nuclear power plant. 'The whole fabric of the community was impacted by this change. It was very sad and mournful,' said Kilkelly, of the Citizens Advisory Panel decommissioning Maine Yankee." Kilkelly, a former Maine senator, spoke to Vermont senators who are considering the economic impacts of Vermont Yankee plant's expected shuttering next year. Sen. Peter Galbraith said Windham County would face the same problems that Wiscasset, Maine faced when its plant closed. Maine Yankee used to provide 90 percent of the town's tax base. Current Wiscasset Select Board member Bob Blagden said "the town lost its tax base, had to cut its police force and raise taxes on residents, even as people moved out."

On its website, WCAX-TV Burlington, Vermont (3/21) reported, Vermont House Minority Leader Don Turner told Channel 3, "I don't think Vermonters understand the full financial impact of that facility. We're starting to see it this week. We'll be talking about an energy bill that came out of the House Energy Committee late last week that has a 55-cent increase in rates for all utility users, so that's just the start I think."

Entergy Eyes Cutting Funds For Pilgrim Plant Emergency Training. The Taunton (MA) Gazette (3/21, Downing, 8K) reported that once a quarter, the "Taunton Emergency Management Agency trains about 200 volunteers how to handle people fleeing a potential disaster at the Pilgrim nuclear power plant in Plymouth." Volunteers are

taught how to "run equipment to check people for radioactive contamination, direct them to showers, dispose of their clothing, get them into white paper suits and give them potassium iodide – scenes being played out for real every day with the failure of the Fukushima Dai-ichi plant in Japan." Until now, the \$5,000 cost of each training session has been covered by Entergy Corp., Pilgrim's parent company, with payments directly to the volunteers. "But the three communities that would act as 'reception centers' for people fleeing a disaster in Plymouth – Taunton, Bridgewater and Braintree – complain that Entergy wants to reduce the amounts they receive under their contracts and have them use those same funds to pay for volunteer training."

New Reactor Designs Will Make Use Of "Passive" Backup Cooling Features. The Kansas City Star (3/20, Everly, Davis, 233K) reported that even since the earliest design versions, nuclear reactors have "relied on electric pumps to bathe hot fuel rods with cooling water to prevent a dangerous meltdown. And if a power outage knocked out those pumps, backup generators would kick in to get them running again." But at Fukushima Dai-ichi, that backup system failed as well. Nuclear engineers say there is a better way to build a plant. "But even as debate rages about the future of nuclear energy, a new generation of inherently safer nuclear plants is coming on line now," the main feature of "the new generation is a so-called passive backup cooling system that would keep reactors safe if electricity were cut off. These systems rely on gravity, temperature-sensitive valves and natural convection currents to move water through a reactor."

Paper Favors Continued Use Of Nuclear Power. In an editorial supporting continued use of nuclear power, the Manitowoc (WI) Herald Times Reporter (3/22, 13K) said that while nuclear safety "is on everyone's mind" and naturally, comparisons will be made between the nuclear industry and oversight agencies of both Japan and the US. "The inevitable question arises: Could what happened in Japan happen here? The answer is yes." But, those "in the nuclear industry said reassuring things following the Japan disaster. Viktoria Mitlyng of the US Nuclear Regulatory Commission said the Kewaunee and Point Beach nuclear plants were made to survive the worst natural disasters on record." The Times Herald concludes, "We hope that nuclear power, with ongoing and thorough oversight, will continue to be part of the nation's energy landscape for many years to come."

NRC, Dresden Officials Confident In Plant's Safety Systems. The Morris (IL) Daily Herald (3/22, Hustis, 8K) examines the question of whether a Fukushima-

type accident could happen in "areas such as Grundy County, where residents have three generating stations as neighbors. ... Dresden has experienced earthquakes in the past, although not to the magnitude the Fukushima reactors were met with last Friday." But still, Dresden site communications coordinator Bob Osgood said, "We've had earthquakes before, but we've found no damage to our equipment," and added, "We're operating safely, our neighbors are safe, and these plants are equipped with numerous and redundant safety systems." Most areas are "potentially susceptible to earthquakes, Region 3 Nuclear Regulatory Commission spokesman Viktoria Mytling of Lisle noted. 'Nuclear plants are built to withstand earthquakes and other natural phenomenon to the highest known level for the area, plus an extra margin,' she said Tuesday."

California Lawmakers Seek Detailed Seismic Studies For Nuclear Plants. The AP (3/22) reports, "State lawmakers called on California utilities Monday to delay efforts to relicense nuclear power plants until the companies complete detailed seismic maps to get a true picture of the risks posed by earthquakes and tsunamis." According to AP, "State senators raised sharp questions about whether California's nuclear plants can withstand a major natural disaster such as the one on March 11 that has left Japan scrambling to control radiation coming from some of its reactors." Notably, "lawmakers also questioned whether the utilities have been dragging their feet on conducting three-dimensional seismic studies called for in a 2008 state report to assess the risks posed by offshore faults."

The Ventura County (CA) Star (3/22, Herdt) reports that "a state senator on Monday accused the operator of the Diablo Canyon nuclear power plant of operating under 'a culture of disregard of risk' and asked Pacific Gas & Electric Co. to suspend or withdraw its application for license renewal until the company has completed advanced seismic studies requested by state regulators three years ago." Sen. Sam Blakeslee, R-San Luis Obispo, "a geophysicist whose district includes the site of the nuclear plant, said PG&E has consistently downplayed the risks associated with the discovery of an offshore earthquake fault line in 2008," the paper adds.

Expert Says Nuclear Accident At Diablo Canyon May Sicken, Kill Over 1 Million. California's Bay Citizen (3/22, Upton) reports that "under intense questioning during a Senate informational hearing on earthquake preparedness Monday, PG&E's Geosciences Department Director Lloyd Cluff acknowledged that uncertainties about earthquakes near the [Diablo Canyon] exist, but said, 'We don't see a concern about the uncertainty.'" Daniel Hirsch, a nuclear policy lecturer at the University of California, Santa Cruz, said

that "a nuclear accident at the facility could sicken or kill more than 1 million people."

NRC Inspects Ameren Callaway Nuclear Plant.

The St. Louis Post-Dispatch (3/22, Tomich) reports, "Federal regulators have begun a special inspection at Ameren Missouri's Callaway nuclear plant after indications that a water pump used to help cool a key plant component in the event of an accident may not work properly." The paper says NRC "inspectors began their work today, and will probe circumstances surrounding an oil sample taken on Feb. 8 that suggested the pump may have been inadequately lubricated."

An Ameren spokesman says the inspection is unrelated to heightened concerns at nuclear plants following the damage to the plant in Japan, reports the AP (3/22).

South Texas Project Scales Back Expansion In View Of Japan Disaster.

The San Antonio Express-News (3/22, Hamilton) reports, "Nuclear Innovation North America announced Monday that it is slowing down development of two additional nuclear reactors at the South Texas Project to give federal regulators and others time to assess the state of the industry in the wake of Japan's nuclear disaster." In a press release, NINA, "the nuclear development company owned by NRG Energy and Toshiba Corp.," said "work on the proposed reactors will be limited to licensing and securing the US loan guarantee."

"Meanwhile, CPS Energy officials on Monday released a statement that San Antonio's municipally owned utility has decided to suspend discussions indefinitely with NRG Energy with respect to buying additional supplies of nuclear power from the South Texas Project," reports the San Antonio (TX) Business Journal (3/22). "As we have indicated for months now, we are currently pursuing an array of other clean affordable supply options. Terminating discussions with NRG allows us to devote more resources in pursuit of the other options," says CPS Energy head Doyle Beneby.

Arizona Corporation Commission Plans Safety Hearing.

The AP (3/21) reported that the Arizona Corporation Commission plans "a public hearing with operators of the nation's largest nuclear power plant to assess safety procedures in the wake of Japan's nuclear catastrophe." According to AP, "the triple-reactor Palo Verde Nuclear Generating Station is located in Wintersburg, about 50 miles west of downtown Phoenix." Notably, the NRC has proposed reviewing "the safety procedures at Palo Verde and at other US nuclear plants" following the Japan nuclear issue. The Phoenix Business Journal (3/22) also covers the news.

Scrutiny Turns To Planning For Nuclear Crisis.

The Chicago Tribune (3/20, Wernau, Black, 488K) reports,

"Fourteen years ago, Zion nuclear power plant's last red-hot fuel rod was lifted from its reactor core and submerged into a pool of water, joining the rest of the plant's 2.2 million pounds of spent fuel." The material was supposed to go to Yucca Mountain, but when the Obama Administration canceled the deep geologic repository, Zion plant operators and crews from more than 100 nuclear reactors in the US were left "with the responsibility for storing on site the dangerous spent fuel." In the "wake of Japan's disaster, the safety calculation involved in storing such waste has changed, experts say." Kennette Benedict of the Bulletin of the Atomic Scientists said Friday that the problems in Japan came after a "once-in-a-millennium [earthquake] event – but we don't plan for those."

Nuclear Reactor Safety Coverage Continues. In continuing coverage of the impact of the nuclear crisis in Japan and its impact on the nuclear power industry in the United States, Virginia Business Magazine (3/22, Squires) reports, Virginia "has two nuclear plants in Louisa and Surry counties." Dominion "has applied to build a third nuclear reactor at its Lake Anna Power Station in Louisa." Dominion's Jim Norvelle said, "We don't have an equity partner yet. We want to keep the option open to meet future demand." The power company expects the NRC "to rule on its application in 2013." According to Norvelle, "Then it becomes a business decision, and we'll have to decide if we want to go through with it."

A blog on the Fredericksburg Free Lance Star (3/21, Dennen) reports, "As the nuclear disaster in Japan continues, the Nuclear Regulatory Commission put out a Q&A addressing seismic issues at US nuclear power plants." The NRC "says it does not rank individual plants' risk of damage in an earthquake after an MSNBC story last week used NRC data to compile such a rating." According to the agency the rankings are "highly misleading." The blog adds, "The MSNBC story listed the North Anna Units 1 and 2 as 7th out of the top 10 plants most likely to have reactor core damage in an earthquake."

An article titled "Japanese Reactors Are Similar Yet Different From Those In Virginia" the Newport News Daily Press (3/22, Nealon) issues a bit of a correction to an article that they printed last week about "the likelihood of a commercial nuclear power plant failure in Virginia." The Daily Press adds, "The article states while the Japanese reactors are about the same age as the reactors at Surry Power Station, the 'similarities end there.'" However, "there are additional similarities. Both type of reactors are powered by enriched uranium, and both rely on large amounts of water and complex electrical systems to prevent the release of dangerous amounts of radiation." Despite the similarities the article points out that the chances for an accident similar to the one that is happening in Japan "are slim."

Dominion's David Christian told WISN-TV Milwaukee (3/21, 11:35 p.m. EST) that the industry is "making preparations if disaster strikes." Christian said, "We have procedures in place, equipment in place, to deal with the unexpected." Managing editor of the Journal Inquirer (3/22) Chris Powell writes that there is "a big spent fuel pool at the Millstone nuclear power complex in Waterford" calling it "by far the biggest environmental hazard in Connecticut."

Barron Touts Constellation's Commitment To Safety. In response to nuclear crisis happening in Japan, Brew Barron, president and CEO of Constellation Energy Nuclear Group, writes in a piece appearing in the Baltimore Sun (3/22, Barron, 228K), that CENG extends "our sincere sympathies to those suffering due to the tragic earthquake and tsunami." Barron goes on to say that safety is a "passion" at CENG and that the company agrees "a fresh review of the industry, with a focus on protective actions in the event of unusual natural events, is appropriate." He concludes, "Rest assured, we will maintain our unwavering commitment to safety and our staunch support for the continuous application of lessons learned."

Some environmental groups have concerns about all NY nuclear plants. On its website, WRVO Radio (3/22, Benjamin) reports, "In the wake of the nuclear crisis in Japan, Lieutenant Governor Robert Duffy is meeting with Nuclear Regulatory Commission officials tomorrow to discuss concerns over the safety of the Indian Point nuclear power plant near New York City." Several "environmental advocacy groups are sending a letter to Governor Andrew Cuomo, urging his administration to go further and discuss concerns at all the state's nuclear facilities, including the three in Oswego County (Nine Mile Point 1, Nine Mile Point 2, and FitzPatrick) and one in Wayne County (Ginna)." WRVO notes, "Two of the plants in Oswego County (Nine Mile Point 1 and FitzPatrick) also have the same model boiling water reactor and containment design as the Fukushima plant in Japan that experienced a near-meltdown after the earthquake and tsunami that hit that country recently."

Exelon Bracing For Costs Of Expected Plant Upgrades. Crain's Chicago Business (3/21, Daniels, 45K) predicts that "fallout" from the Fukushima plant disaster "is headed straight for" Exelon Corp. The "biggest nuclear plant operator in the United States" will "bear the full force of an expected crackdown by regulators spurred to action by uncontrolled radiation releases across the Pacific." Exelon CEO John Rowe said "he expected the Nuclear Regulatory Commission to perform special safety reviews of all the nation's nukes—something Mr. Obama later ordered." Crain's adds, "Improvements to backup power systems might be expected in the wake of their failure in Japan, but costs of

that sort would be on the lower end, experts say. Bigger-ticket upgrades could include shoring up pools where spent fuel rods are stored at the plant sites," and of course, "if the Japanese containment vessels fail, prompting the NRC to seek major upgrades of US plant vessels, then costs could skyrocket."

Florida Utility Eyeing Santee Cooper's Share Of New VC Summer Units. The Myrtle Beach Sun News (3/22, Wise) reports, "A Florida utility plans to buy into Santee Cooper's share of two new nuclear units to be built north of Columbia amid the uncertainties for the industry following the disaster in Japan." On Monday, Santee Cooper said that it had "signed a letter of intent to negotiate a purchase power agreement with Orlando Utilities Commission for a portion of the state-owned company's stake in the planned \$10 billion new reactors at V.C. Summer Nuclear Generating Station in Fairfield County." OUC "also could buy part of Santee Cooper's ownership in the joint venture."

NextEra Expresses Support For Nuclear Power. The Palm Beach Post (3/22, Salisbury) reports, "NextEra Energy Inc., the Juno Beach-based parent company of Florida Power & Light Co., is a major producer of the power source that has been thrust to the front and center since the catastrophe in Japan." On Monday, NextEra Energy CEO Lewis Hay said that they are the "nation's third-largest owner and operator of nuclear power plants." Hay said, "The nuclear industry is a unique industry. We all pull together and help one another out." He added that the industry will learn lessons from the incident and incorporate them "operating procedures and plant design."

Nine Mile Point Unit 1 Shutdown For Refueling. The Syracuse Post Standard (3/22, Groom) reports, "Nine Mile Point Unit I nuclear plant has been shut down for scheduled refueling and maintenance, said Jill Lyon, speaking for Constellation Nuclear Energy Group, the plant's owner." According to Lyon "the plant is taken offline every 24 months to refuel the reactor and perform normal maintenance work and inspections." Reuters (3/22) is also covering this story.

Judge Dismisses Challenge Of Nuclear Plant Tax Agreement. The Syracuse Post Standard (3/22, Groom) reports, "The petition filed by the Oswego school district challenging the tax agreement with Nine Mile Point Unit I has been dismissed in state Supreme Court." Justice Hugh Gilbert has "dismissed the school district's petition stating it should not have been filed as a challenge to the assessment set by the Scriba Board of Assessment Review." Gilbert adds "the assessment only can be challenged in a tax

grievance petition" and "also ruled the school district cannot use this procedure to challenge the assessment because only the property owner can file a tax grievance." YNN News (3/22) is also covering this story.

Connecticut Legislature Considering Tax On Oil, Coal, Nuclear Generators. The AP (3/22) reports the Connecticut "legislature's Energy and Technology Committee is scheduled to meet Tuesday to consider the bill, which would impose a tax on generators that use oil, coal and nuclear power." According to the state Office of Consumer Counsel "the tax would raise \$340 million in revenue, with \$332 million from Connecticut's Millstone nuclear plants." Dominion "says the tax will raise prices for consumers" and that "the measure is discriminatory because it is applied to only a few energy sources."

Secretary Chu Cancels Trip To Brazil To Focus On Japanese Nuclear Crisis. The Washington Post (3/22, O'Keefe, 605K) "Federal Eye" blog reports that "eight Cabinet secretaries and top officials from other agencies are along for the ride," as President Obama travels through Latin American. The article explains, though, that "Energy Secretary Steven Chu was also scheduled for the trip, but canceled to focus on the US response to the Japanese earthquake, according to the White House. Interior Secretary Ken Salazar is also scheduled to visit Brazil in the coming weeks to follow up on energy-related topics discussed during Obama's trip."

Rep. Shimkus Questions Legality Of Closing Yucca. E&E Daily (3/18, Northey) reported that Rep. John Shimkus (R-Ill.), chairman of a House Energy and Commerce subcommittee, "is challenging whether the Nuclear Regulatory Commission had the legal authority to suspend a safety review of Yucca Mountain in Nevada as a permanent spent nuclear fuel repository." Mr. Shimkus "warned NRC Chairman Gregory Jaczko during a budgetary hearing Wednesday that 'you better be double checking your facts' on whether the move was legal." Shimkus said "it is 'a stated federal position by law that Yucca Mountain should be open, that's the legal authority; there's no legal authority to close Yucca Mountain.'"

Greenspun Faults Plan To Push Ahead With Yucca. In a Las Vegas Sun (3/20, 41K) column, Brian Greenspun wrote that in the wake of the earthquakes and tsunamis in Japan, his column was "an attempt to separate the politics of money from the policies of good government and sane stewardship of the environment and the right of the people to live secure in the belief that their government is not going to do them in." Greenspun adds, "At the heart of the Yucca Mountain debate is this: The federal government and the

Yucca support staff always believed it was responsible, reasonable and desirable to build a nuclear waste dump in the middle of the third most active earthquake zone in the country. And, deep geologic burial would take place in one of the most porous mountains around — that means water flows from its top through the nuke canisters, corroding them on the way through, and then into the water table below — and you have the makings of an environmental disaster.”

More Commentary. In an editorial, the Washington Times (3/22) says the “ongoing crisis at Japan’s damaged nuclear power plants raises the issue of whether our own radioactive materials are vulnerable to similar catastrophes. The states of South Carolina and Washington will argue today before the US Court of Appeals for the District of Columbia that the Obama administration had no authority to order the closing of the Yucca Mountain disposal facility in Nevada. ... President Obama fulfilled a campaign promise to his radical supporters by zeroing out funding for Yucca Mountain in his fiscal 2011 budget last year.” Given Japan’s recent tragedy, “lawmakers ought to persuade the administration to reconsider its position on nuclear waste disposal.”

Federal Court To Hear States’ Arguments For Yucca Project. The Augusta (GA) Chronicle (3/22, Pavey) reports the DC Circuit Court of Appeals will hear oral arguments in the lawsuit filed by South Carolina, Aiken County, Washington state, and three of its citizens seeking to force the federal government to complete the Yucca Mountain nuclear waste repository. South Carolina Attorney General’s Office communications director Mark Plowden said, “In this case, existing law is very clear that Congress has mandated that the nation’s high level nuclear waste shall be stored at the Yucca Mountain facility in Nevada,” adding, “All of the states are in agreement, with the exception of Nevada.”

Politics To Blame For Lack Of Nuclear Repository, Columnist Says. Dennis Byrne writes in a column for the Chicago Tribune (3/22, 488K) that “thanks to Sen. Harry Reid (D-NV), Democratic Presidents Bill Clinton and Barack Obama and anti-nuke champions, tens of thousands of tons of dangerously radioactive fuel rods have been ‘temporarily’ stored for up to 60 years on American nuclear power sites, many in Illinois. Many are stored like those in pools of water that are threatening to go dry at the damaged nuclear reactors in Japan.” And while “common sense and science dictate that spent fuel should be stored far away from the power plant, someplace permanent that wouldn’t magnify the consequences of a catastrophic accident,” it isn’t because of politics, according to Byrne, citing the debate over the completion of the Yucca waste repository.

Vitamin Pill Helps Astronaut Deal With Radiation. Discovery News (3.22, Klotz) reports, “To

mitigate the effects of radiation on astronauts, doctors advise a simple measure: Take a vitamin pill.” Ann Kennedy, head of the National Space Biomedical Research Institute Radiation Effects Team, said a vitamin pill can “greatly modify the radiation response” and recommends it to astronauts aboard the International Space Station as well as anyone near the troubled nuclear reactor in Japan. Marcelo Vazquez of the NASA Space Radiation Laboratory said, “Workers now at the plant — (who) are apparently receiving high doses of radiation and they are not very well protected — could be in a similar range (of exposure) to those that an astronaut will encounter during a solar particle event.”

Facts About NRC Considered. US News and World Report (3/22, Huey) runs a list of “10 Things You Didn’t Know” about the NRC. Number 3 says the “commission is designed to be an independent regulator of nuclear material and nuclear power used commercially.” Number 5 says the “NRC is made up of five commissioners, nominated by the president and confirmed by the Senate to serve staggered five-year terms. No more than three commissioners can be from the same political party.”

INTERNATIONAL NUCLEAR NEWS:

700 Workers Evacuated From Fukushima Plant Monday. The CBS Evening News (3/21, story 4, 2:50, Couric, 6.1M) reported, “It’s a sign this crisis is far from under control. Ten days after the Fukushima Daiichi nuclear plant was knocked out by Japan’s massive earthquake and tsunami and once again reactor three is spewing smoke a few hours later white smoke from reactor two. It’s a mysterious and serious setback, one that prompted workers to evacuate and once again stopped efforts to stabilize the plant. ... Today’s smoking reactors have engineers baffled.”

NBC Nightly News (3/21, story 8, 1:50, Williams, 8.37M) added, “In another setback in the efforts to contain the crippled reactors, engineers have discovered that some of the pumps are damaged beyond repair. They won’t be able to restart them any time soon. ... Despite those setbacks, officials with the US Nuclear Regulatory Commission emphasize sea water is now reaching all of the troubled reactors and attempts to restore power continue.” Bill Borchardt, NRC: “I would say optimistically things appear to be on the verge of stabilizing.”

The Washington Post (3/22, Nakamura, Achenbach, 605K) reports, “Emergency workers lost precious hours Monday in their ongoing battle to get the six-reactor complex under control when smoke billowed from two of the reactor units. ... No one was hurt, and the incidents were not as

alarming as three previous explosions that damaged buildings housing reactors," but "radiation levels spiked briefly, and the Tokyo Electric Power Co. (Tepco) chose to evacuate about 700 workers."

The New York Times (3/22, A10, Belson, Tabuchi, Jolly, 1.01M) adds, "Efforts to stabilize the crippled nuclear power plant in Fukushima stalled on Monday when engineers found that crucial machinery at one reactor required repair, a process that will take two to three days, government officials said. ... Engineers were also trying to repair the ventilation system in the control room used to monitor conditions in the No. 1 and No. 2 units."

According to the Los Angeles Times (3/22, Lee, Kim, Glionna, 681K), "Some Japanese scientists said the problems didn't appear to signal a deteriorating situation at Fukushima, where workers had been making progress in the painstaking work to contain the nuclear crisis."

Despite yesterday's setbacks, Bloomberg News (3/22, Okada, Inajima) reports Japanese Prime Minister Naoto Kan "said he can see 'light at the end of the tunnel' even as smoke at two reactors hampered efforts to restore cooling systems." According to Bloomberg, "Kan's optimistic statements are the strongest yet from a Japanese official."

Radiation Plume Not Considered A Danger To Americans. According to the New York Times (3/22, Broad, 1.01M), "Harmless traces of radiation from the stricken nuclear complex in Japan have been detected wafting over the East Coast of the United States. ... Health experts said that the plume's radiation had been diluted enormously in its journey of thousands of miles and that – at least for now, with concentrations so low – its presence will have no health consequences in the United States."

Another article in the New York Times (3/22, Kopytoff, 1.01M) notes that "with small amounts of radiation from Japan's damaged reactors wafting across the Pacific Ocean, relief crews, businesses and ordinary consumers have bought nearly every Geiger counter available from the few retailers that sell them."

Radiation Levels Force US Carrier To Leave Japanese Port. The CBS Evening News (3/21, story 6, 1:35, Couric, 6.1M) reported, "The aircraft carrier George Washington was forced to leave its Japanese port over fears of radiation. ... The decision to send the George Washington to sea even though one of its nuclear reactors is down for repairs, came in response from a shift in the wind which is blowing increased amounts of radioactivity south over Tokyo toward the American bases at Yokosuka and Atsugi. The winds threatened to dump as much radioactivity in the next 24 hours as in the preceding ten days."

Work Continues To Restore Power To Stricken Fukushima Reactors. Platts (3/22, Dolley) reports, "Pressure levels rose then stabilized Sunday in one of the

crippled reactors at the Fukushima I nuclear power plant in Japan, government and industry officials said. Plans being considered earlier Sunday to vent radioactive steam from the reactor to reduce pressure were deferred and workers will continue to monitor reactor pressure, Tokyo Electric Power Co. said in a statement Sunday afternoon local time." Work continues to "restore outside electric power to instruments and safety systems at the site's six reactors and spent fuel pools." Sunday, "an external power cable had been connected to the 'distribution switchboards' at units 1 and 2" and efforts "were continuing to restore external power to units 3 and 4. Fuel is still 'partially or fully exposed' in units 1, 2 and 3, JAIF said, creating a risk of fuel damage, generation of explosive hydrogen gas and possible core melting."

EU Ministers Unable To Agree On New Inspections. The Wall Street Journal (3/22, Smith, Radowitz, 2.09M) reports that in a special session in Brussels yesterday to address the impact of the Japanese crisis on the nuclear energy industry, EU energy ministers were unable to reach an agreement on new tests for existing European nuclear plants.

Warnings Regarding Aging Reactors Went Unheeded. The New York Times (3/22, A1, Tabuchi, Onishi, Belson, 1.01M), in a front-page article titled, "Japan Extended Reactor's Life, Despite Warning," reports, "Just a month before a powerful earthquake and tsunami crippled the Fukushima Daiichi plant at the center of Japan's nuclear crisis, government regulators approved a 10-year extension for the oldest of the six reactors at the power station despite warnings about its safety. ... Several weeks after the extension was granted, the company admitted that it had failed to inspect 33 pieces of equipment related to the cooling systems, including water pumps and diesel generators, at the power station's six reactors, according to findings published on the agency's Web site shortly before the earthquake."

Death Toll Expected To Be More Than 18,000. ABC World News (3/21, story 5, 2:05, Sawyer, 8.2M) reported, "The death toll from the earthquake and tsunami is now expected to top 18,000."

Total Crisis Bill Could Be Three Times The Cost Of Katrina Cleanup. The Washington Post (3/22, Nakamura, Achenbach, 605K) reports that the World Bank estimates Japan "will face five years of rebuilding from the disaster, which could cost the nation up to \$235 billion." The Post notes Hurricane Katrina is thought to have "caused \$81.2 billion in damage."

The Wall Street Journal (3/22, Greil, Oster, Ng, 2.09M) says the firm Risk Management Solutions estimates the cost could eventually run as high as \$300 million.

Japanese Food Export Industry Threatened. The CBS Evening News (3/21, story 5, 1:35, Couric, 6.1M) reported, "The US, China, South Korea, and India have all stepped up their inspections of food exported by Japan,"

while Italy "has banned them all together. At stake for Japan, an export market worth \$5 billion a year. ... Some spinach samples taken south of Fukushima tested at more than seven times the illegal allowance of radioactive iodine. Seawater near the plant has tested 126 times higher than the legal limit."

ABC World News (3/21, story 4, 2:25, Sawyer, 8.2M) reported, "Tokyo tap water shows elevated levels of radioactive iodine and cesium. Milk, canola, spinach and other leafy vegetables farmed near the reactor are considered unsafe for human consumption. ... We have here an assortment of produce we brought at an ordinary Tokyo supermarket" marked "Fukushima fresh vegetables," and "if you take our trustee Geiger counter and hold it right up to the package it immediately starts to crackle."

The Washington Times (3/22, Johnson, 77K) notes that the World Health Organization "warned of contamination in farm products beyond the vicinity of the seaside nuclear reactors in Fukushima province." A WHO report "suggested that wind and rain has blown radioactive particles to the west and south far beyond Japan's 18-mile danger zone around the power plant."

Chileans Protest US Nuclear Deal Signed Friday. The Christian Science Monitor (3/22, Bodzin, 48K) reports, "Among the 'urgent events' that President Obama said he discussed Monday with Chilean President Sebastián Piñera was the unfolding nuclear crisis in Japan. ... While the crisis only appeared to be mentioned in passing during a press conference in Santiago during Mr. Obama's five-day regional tour, it has set off a firestorm of criticism against Mr. Piñera and caused a major rethink over energy policy here. Yesterday, some 2,000 people marched through the capital to protest a new US-Chile nuclear power cooperation agreement signed Friday as radiation leaked from Japan's Fukushima nuclear plant."

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TODAY'S EDITION

NRC News:

No Urgent Changes Seen For US Nuclear Plants (NYT)	2
Japan Nuclear Crisis After Earthquake Doesn't Warrant US Changes, Official Says (AP)	3
NRC Readies Review Of US Plants (POLITCO)	4
NRC Sees Signs Of Stability In Japan, Plans Review Of US Reactors (GWIRE)	4
US Plans More Nuclear Inspections After Japan Crisis (REU).....	5
Nuclear Regulatory Commission To Get Update On Japan Crisis, Begin Review Of U.S Plant Safety (AP)	5
NRC Likely To Approve Study Of Japan Nuclear Incident (CNN) 5	
Jaczko's Call On Fukushima Radiation Plucks US Regulator From Obscurity (BLOOM)	6
Martha Coakley Asks Feds To Re-examine Nuclear Storage (AP)	8
Operators Of Indian Point Say Changes Are Likely (NYT)	8
US Nuclear Plants Are Safer Than Japan's, But Operational Quality Needs Work (CWIRE)	9
US Reactors Vulnerable In Event Of Japan-scale Crisis (REU). 12	
Japan's Nuclear Crisis Reignites Safety Debate (USNEWS)	12
NEWS ANALYSIS: Japan Crisis Puts Global Nuclear Expansion In Doubt (PLATTS)	13
NRC Plans Meetings To Discuss Reactors In N.Y., S.C. (GWIRE)	14
Despite Calls To Slow Down, NRC Grants Vt. Renewal (AP)	15
Vermont Nuke Plant Gets Federal OK For 20-Year Renewal (AP)	16
Sanders Asks Obama For Moratorium On License Renewals For Nuclear Plants (VTD)	16
NRC Issues New License For Yankee (BRATBORO)	17
Vermont Yankee Has 20-year Extension License In Hand (BOS)	17
Entergy's Vermont Nuclear Plant Gets NRC Extension (WSJ) ..	18
NRC Grants Entergy 20-year Renewal For Vermont Yankee Nuclear Power Plant (NOTP)	18
NRC Officially Issues 20-Year License Renewal To Vermont Yankee (VTPR)	19
My Turn: Support Yankee's Scheduled Closure (BURFP)	20
Can Vermont Learn From Maine Yankee's Closing? (WCAXTV)20	

Vt. House Minority Leader Voices Concern Over Yankee Closure (WCAX)	21
Pilgrim Nuclear Plant Wants To Cut Training Funds (TAUGAZ) 21	
New Designs For Nuclear Power Plants Seek To Generate Greater Trust (KCS)	22
Editorial: Keep Nuclear Part Of Energy Future (MHTR)	25
Could It Happen Here? (MORRISDH)	26
Calif. Senators Call On Utilities To Delay Nuclear Plant Relicensing For New Seismic Studies (AP)	27
Senator Asks PG&E To Suspend License Renewal Request For Diablo Canyon Nuclear Plant (Ventura County Star) ..	28
PG&E Blasted For 'Disregard Of Risk' At Nuclear Plant (BAYCIT)	29
NRC Sends Inspectors To Ameren's Callaway Plant (SLPD)	30
NRC Inspectors Look At Lubrication Concern At Missouri Nuclear Plant (AP)	30
STP Expansion Slowed Down In Wake Of Japanese Disaster (SAEN)	30
South Texas Nuclear-power Plant Expansion Project Put On Hold (SABIZ)	31
Arizona Capitol Times » Blog Archive » Arizona Nuclear Power Plant Facing Safety Hearing (AP)	32
Arizona Corporation Commission To Get Status Update On Nuclear Industry (PHOBIZ)	33
Spent Nuclear Fuel Storage Comes Under Scrutiny (CHIT)	33
Local And State News From Virginia Business (VABIZ)	34
More On Nuke Plants' Earthquake Risk (FFLS)	35
Japanese Reactors Are Similar Yet Different From Those In Virginia (NWPRTNWZ)	36
Liquor Lobby Tools And Spent Fuel Pools (Journal Inquirer)	36
Constellation: Lessons From Japan Will Make A Safe US Nuclear Industry Safer (BSUN)	37
Environmental Groups Say Cuomo Administration Should Address Safety Concerns At Upstate Nuclear Facilities (2011-03-21) (WRVO)	38
Exelon Faces Regulatory Fallout After Japanese Nuclear Disaster (CRCHIBIZ)	39
Florida Utility To Buy Into Future S.C. Nuclear Plants (MYRTLE)40	
NextEra CEO Says Nuclear Plants Well-prepared For Disasters (PALMBEACHP)	41

Nine Mile Point Unit I Taken Offline For Scheduled Refueling (SPS)	41	Smoke Plumes Set Back Japan's Efforts To Contain Nuclear Crisis (LAT)	51
UPDATE 1-Constellation Shuts NY Nine Mile 1 Reactor To Refuel (REU)	41	Kan Sees Progress At Fukushima Plant As Smoke At Reactors Hampers Work (BLOOM)	52
Judge Dismisses Oswego School District Challenge Of Nuke Plant Tax Agreement (SPS)	42	Radiation Over US Is Harmless, Officials Say (NYT)	53
Lawsuit Dismissed Against Constellation Energy Group (YNN)	42	Japan's Nuclear Crisis Causes Run On Radiation Detectors (NYT)	54
Conn. Lawmakers Consider Tax On Electricity Generators As Critics Cite Rising Cost Of Power (AP)	42	Recovery Efforts Continue At Japan's Fukushima Nuclear Plant (PLATTS)	55
Several Obama Cabinet Secretaries Also In Latin America (WP)	43	EU Fails To Agree On Nuclear Stress-Tests (WSJ)	56
Was NRC's Decision To Close Yucca Legal? (EED)	43	Japan Extended Reactor's Life, Despite Warning (NYT)	56
Yucca Has Allies, Even As Japan Suffers (LVS)	44	Japan Damage Cost: \$300 Billion (WSJ)	58
EDITORIAL: Obama's Nuclear Negligence (WT)	45	Japan's Leader Tries To Assuage Nuclear Concerns (WT)	58
Appeals Court To Hear Yucca Arguments (AUGC)	46	US Agrees To Help Chile Go Nuclear, Despite Japan Disaster (CSM)	59
Getting Rid Of Spent Nuclear Power Fuel (CHIT)	46		
Radiation Worrying You? Take A Vitamin (DISC)	47		
10 Things You Didn't Know About The Nuclear Regulatory Commission (USNEWS)	48		
International Nuclear News:			
Japan's Catastrophe Resonates At Economic, Regulatory And Personal Levels (WP)	49		
New Repairs Delay Work At Nuclear Plant In Japan (NYT)	50		

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NRC NEWS:

No Urgent Changes Seen For US Nuclear Plants (NYT)

By Matthew L. Wald

New York Times, March 22, 2011

ROCKVILLE, Md. — A top official with the Nuclear Regulatory Commission said Monday that the nuclear crisis in Japan did not warrant any immediate changes at American nuclear plants.

The commission's inspectors at each site have been told to double-check that emergency equipment and precautions mandated years ago were still in place, including temporary hoses and fittings and other last-ditch backup equipment, said the official, R. William Borchardt, the executive director for operations.

The inspectors were also asked to verify that plant operators knew where the equipment and materials were, Mr. Borchardt said, "to make sure they haven't fallen into disuse because they haven't been used."

"Every single day, we assess whether or not there is some additional regulatory action that needs to be taken immediately in order to address the information we have to date," he said in a briefing to the commission.

The N.R.C. is to vote soon on a plan to conduct a 90-day study of the significance of the Japanese events for American reactors, the commission's chairman, Gregory B. Jaczko, said, with updates after 30 and 60 days. But Mr. Borchardt and other staff members have said repeatedly that they did not yet have a full picture of events in Fukushima.

The information emerging is sometimes contradictory. While the primary containment for two of the reactors was previously reported to have been damaged by explosions, Mr. Borchardt said that at this point they "appear to be functional." He was referring to the steel shells, shaped like inverted light bulbs, that surround the reactor vessels and a doughnut-shaped pool of water around them used for pressure suppression.

The secondary containment, the weaker, boxy buildings that also enclose the spent-fuel pools, have been heavily damaged by hydrogen explosions. That hydrogen was presumably created by fuel damage in the reactor vessels, and then vented to the secondary containment.

One question for American regulators is whether steps that they have ordered in the last 20 years, to "harden" the vent pipes, had also been taken in Japan, or whether at Fukushima those vents were simple ductwork that was overpressurized when workers opened valves to release excess pressure from the primary containment.

That is one of many questions that must be answered to determine the extent to which American plants are subject to the same hazards.

N.R.C. officials said they were confident about preparations already in place, but open to improvements. During the 90-minute briefing, two commissioners used the phrase "systematic and methodical" to describe the approach they wanted to use in applying lessons from Japan to America's nuclear plants.

As if to underscore the point, a different department of the commission announced Monday that the N.R.C. had issued a 20-year license extension to the Vermont Yankee reactor, which is a near twin of Fukushima Daiichi No. 1. Commission officials said that if the accident in Japan showed a need for changes in Vermont or elsewhere, they would order them promptly, even before the 20-year extension began.

One commissioner, Kristine L. Svinicki, said, "Some may characterize that our faith in this technology is shaken." But she added: "Nuclear safety is not and cannot be a matter of faith. It must be a matter of fact."

The commission has sent 11 staff members to Tokyo, where they are helping American Embassy officials to understand what is happening and, as commissioners put it, "interacting" with their counterparts at the Japanese nuclear safety agency and executives at Tokyo Electric Power Company.

Mr. Jaczko said Sunday that there were no plans to send the N.R.C. staff members to Fukushima itself. Commission officials said that two more N.R.C. groups would travel to Japan this week.

Japan Nuclear Crisis After Earthquake Doesn't Warrant US Changes, Official Says (AP)

By Matthew Daly

Associated Press, March 22, 2011

ROCKVILLE, Md. -- The nuclear crisis in Japan, while severe, does not warrant any immediate changes in the United States, a top US nuclear official said Monday.

View full size Japan Defense Ministry photo via AP Japan Self-Defense Forces workers talk before starting to spray water toward Unit 3 of the troubled Fukushima Daiichi nuclear complex, Okumamachi, in northeastern Japan on Friday.

The Nuclear Regulatory Commission's executive director for operations, Bill Borchardt, said officials have "a high degree of confidence" that operations at the 104 nuclear reactors in 31 states are safe. He said inspectors at each of the plants have redoubled efforts to guard against any safety breaches.

Borchardt gave NRC commissioners a detailed look at the Fukushima Dai-ichi plant, damaged in the March 11 earthquake and tsunami, and the US response thus far.

Borchardt told commissioners that Units 1, 2 and 3 at the crippled Fukushima plant have some core damage, but that containment for those three reactors has not been breached.

"I would say optimistically that things appear to be on the verge of stabilizing," he said.

The Tokyo Electric Power Co., which operates the troubled plant, has been able to bring offsite power onto the site from a nearby transmission line, Borchardt said, the first sign of progress at the plant in recent days. Water is being injected into the reactor vessels in Units 1, 2 and 3, and containment in all three units appears to be functional, he said.

The five-member commission was reviewing the Japanese crisis -- it is the worst nuclear disaster in a quarter-century -- and was set to approve a 90-day safety review of operations at the US nuclear fleet to comply with a call last week by President Barack Obama.

NRC Chairman Gregory Jaczko said his agency has a responsibility to the American people to undertake "a systematic and methodical review of the safety of our own domestic nuclear facilities," in light of the Japanese disaster.

The nuclear plant's cooling systems were wrecked by the massive earthquake and tsunami that devastated northeastern Japan on March 11. Since then, conditions at the plant have been volatile; a plume of smoke rose from two reactor units Monday, prompting workers to evacuate.

As work at the plant continues, US officials will look to see whether information from Japan can be applied in the United States to ensure U. S. reactors remain safe, Jaczko said.

But even some of his fellow commissioners had questions about the US response.

Commissioner George Apostolakis wondered why the NRC did not close some older nuclear plants, as Germany did.

"Are we less prudent than the Germans?" Apostolakis asked.

Borchardt replied that officials "asked ourselves the question every single day, 'Should we take a regulatory action based upon the latest information?'" Each time, he said, the answer was no.

"I'm 100 percent confident in the review that we've done and we continue to do every single day that we have a sufficient basis to ... conclude that the US plants continue to operate safely," he said.

Borchardt also defended the commission's recommendation that US citizens stay at least 50 miles away from the troubled Fukushima plant. Current US guidelines call for a 10-mile evacuation zone around all US nuclear plants, and some critics have suggested that the NRC was imposing a stricter standard on Japan than on US nuclear reactors.

Borchardt said the recommendation about Japan was made based on conditions at the plant -- namely that there were degraded conditions in two spent-fuel pools at the site and likely damage to three of the reactor cores.

If the same conditions occurred in the United States, he added, "we would have done the same analysis and gone through the same thought process," and likely would have extended the evacuation zone and taken other steps to protect the public.

A spokesman for the Nuclear Energy Institute, an industry group, said US officials acted appropriately in recommending the 50-mile evacuation zone for US citizens in Japan.

"They acted cautiously based on the uncertainty of what the radiation exposures are at the plant," spokesman Steve Kerekes said.

NRC staff and other US experts have been in Tokyo for more than a week conferring with Japanese government and industry officials on the disaster. A second wave of NRC employees is heading to Japan this week, in many cases replacing workers who are already there.

NRC Readies Review Of US Plants (POLITCO)

By Darius Dixon

Politico, March 22, 2011

The Nuclear Regulatory Commission will conduct both a 90-day "snapshot" review of US nuclear plants as a result of the crisis in Japan, as well as a comprehensive long-term regulatory study once the situation has been averted.

The 90-day review will focus on any "obvious" emergency preparedness changes or procedures that need to be adjusted, Bill Borchardt, the NRC's executive director for operations, said Monday.

Any long-term review will include other federal agencies, including the Federal Emergency Management Agency, Borchardt said.

Ever since the nuclear crisis began overseas a considerable amount of attention has focused on reactors in the US with similar configurations as those experiencing problems at the Fukushima Daiichi facility. There are 23 reactors among the US nuclear fleet that are boiling water reactors with Mark 1 containment systems.

Borchardt assured the commission that the US has had a Mark 1 containment improvement program since the 1980s, a program he wasn't sure the Japanese had in place. One component of the improvement program required a more robust venting system that would have prevented the buildup of hydrogen that is believed to have caused explosions at several Fukushima reactor buildings.

NRC Sees Signs Of Stability In Japan, Plans Review Of US Reactors (GWIRE)

By Hannah Northey

Greenwire, March 22, 2011

Federal nuclear regulators issued a hopeful report today on Japan's nuclear crisis and outlined plans for a two-tiered review of the safety of 104 US reactors.

Containment Units 1, 2 and 3 at the crippled Fukushima Daiichi nuclear plant, which was rocked by a massive earthquake and tsunami on March 11, appear to be stabilizing, as are spent fuel pools at the complex, said Bill Borchardt, the US Nuclear Regulatory Commission's executive director of operations.

The earthquake affected 10 reactors, and the ensuing tsunami caused a loss of emergency power to six units at the Fukushima Daiichi plant. In the wake of explosions and fires at the power plant, NRC is now struggling to ascertain if Units 1, 2 and 3 have experienced core damage, Borchardt said.

"Today, all three units appear to be in a stable condition with seawater injection being used to keep the reactors cool," Borchardt told commissioners today. "Containment integrity for all three units is also currently maintained."

Although gray smoke was seen rising from the nuclear complex this morning, Borchardt said there were no indications of increased temperature or radioactivity at the plant (see related story).

Tokyo Electric Power Co. has extended power to a site near the crippled plant, and Japanese officials are in the process of laying temporary cables to pumps and valves in Units 1 and 2 and will do the same for Units 3 and 4 during the next couple of days, he said.

"The fact that off-site power is close to being available for use at plant equipment is perhaps the first optimistic sign that things could be turning around," Borchardt said.

NRC has sent at least 11 experts to Japan to gather information and consult with Japanese officials.

US reactor review

NRC could vote as early as today on plans to conduct a 90-day review of information coming out of Japan and how those findings relate to oversight of the fleet of US reactors.

The short-term review will provide a snapshot of US reactor safety and could evaluate how nuclear plants would deal with emergencies.

NRC reports will be made after 30 and 60 days and have limited stakeholder involvement, Borchardt said.

The plan will also address the implementation of a separate long-term review of technical issues and potential changes to NRC's oversight program and rulemakings, Borchardt said.

The commission has not stated a start date of that lengthier review because it would be launched after more conclusive information is obtained on the Japan disaster. That study, he said, will include "substantial stakeholder involvement."

Simultaneously, NRC has launched a plant-by-plant review that President Obama called for last week (E&ENews PM, March 17).

The commission is reviewing its 35-year regulatory framework in light of the Japan crisis.

Borchardt said the agency is confident in the safety of the US fleet. NRC has fine-tuned its regulations in response to past emergencies, including the partial meltdown at Pennsylvania's Three Mile Island power plant and the terrorist attacks of Sept. 11, 2001.

The agency has issued a notice to the industry that the commission will be following up to ensure that emergency responses at US reactors "haven't fallen into disuse because they haven't been used," Borchardt said.

US Plans More Nuclear Inspections After Japan Crisis (REU)

By Ayesha Rascoe And Timothy Gardner

Reuters, March 22, 2011

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

Nuclear Regulatory Commission To Get Update On Japan Crisis, Begin Review Of U.S Plant Safety (AP)

By Matthew Daly

Associated Press, March 22, 2011

WASHINGTON – Nuclear energy regulators are meeting Monday to receive an update on the status of Japan's stricken nuclear complex and begin short-term and long-term reviews of US nuclear safety.

The five-member Nuclear Regulatory Commission will get an update from its staff on the ongoing crisis in Japan and devise a plan to meet President Barack Obama's call for a comprehensive safety review at the 104 US nuclear reactors.

NRC Chairman Gregory Jaczko said the agency was likely to perform a short-term review of existing nuclear reactors, "and then probably a much longer look" based on information from Japan.

Jaczko promised a "methodical" examination of the accident at the Fukushima Dai-ichi plant and a thorough review of US practices going forward.

NRC Likely To Approve Study Of Japan Nuclear Incident (CNN)

By Mike M. Ahlers, CNN

CNN, March 22, 2011

Rockville, Maryland (CNN) – The Nuclear Regulatory Commission was poised Monday to begin a 90-day review of Japan's nuclear crisis – including a 30-day "quick look" – so that any lessons learned could quickly be applied to the 104 commercial reactors in the United States.

At the commission's first meeting since the March 11 earthquake and tsunami, NRC's staffers assured the five-member body they had "a high degree of confidence" in existing safeguards at US nuclear power plants. But the staff suggested both near-term and long-term reviews of problems that have plagued the Japanese reactors.

The 90-day study would use "all of the currently available information" out of Japan, and the staff would issue both 30-day and 60-day "quick look" reports to update the commission and allow for any necessary changes. Results will be made public, the NRC said, and longer term investigations would likely follow.

"Here in the United States we have an obligation to the American people to undertake a systematical and methodical review of the safety of our own nuclear facilities in light of the of the natural disaster and the resulting nuclear situation in Japan," said Gregory Jaczko, chairman of the NRC.

William Borhardt, the NRC's executive director for operations, said the NRC staff has continually asked itself whether it should be proposing regulatory changes in light of events in Japan. But existing information "if anything, it's given me a bit of confidence that all of these redundancies are paying off," he said.

The staff has concluded that "US plants continue to operate safely," he said.

"We do not expect the releases of radioactive material that have occurred in Japan to have any effect on the health and safety of the US population," he said. Naturally occurring radiation from the sun, rocks and other sources is "100,000 times" the amount measured in the US originating from Fukushima, he said.

Borhardt also gave a status report on conditions at the Fukushima Daiichi plant in Japan.

"In my view, the fact that the off site power is close to being available for use of plant equipment is perhaps the first optimistic sign we've had that things could be turning around," he said

"We believe that the spent fuel pools on units 3 and 4... that the situation there is stabilizing, that the containment in all three units 1,2, and 3 appear to be functional, and that there is water being injected into the reactive vessels in units 1,2, and 3," Borhardt added. "I would say optimistically that things appear to be on the verge of stabilizing."

Borhardt said the source of gray smoke seen emanating from Unit 3 Monday was unknown, but said there apparently "has been no increase in temperature or in radioactivity."

Borhardt also elaborated on a US government recommendation that US citizens evacuate from a 50-mile radius around Fukushima. That decision, he said, was based not on radiation readings, "but on what at the time was possible" given likely core damage in three reactors and problems at spent fuel pools. The recommendation was prudent and conservative, he said.

Borhardt testified the US principles which govern nuclear reactor safety – a "defense in depth" strategy, robust containment systems, redundant safety systems, and emergency preparedness – are being borne out by the Japanese experience. In particular, the Japan incident has shown the value of "station blackout" rules, which require nuclear plants to have backup systems in case electrical power is lost.

Borhardt said while the NRC has provided assistance to Japan, it has maintained its focus on its top responsibility, ensuring the safety of domestic nuclear power plants and materials.

The NRC has sent 11 of its personnel to Japan to assist in efforts there.

The commissioner of the NRC, William Ostendorff said, "I believe that our existing licensing and oversight activities assure us that our commercial nuclear plants in this country are safe. On the other hand, I know that we must and most certainly will conduct a thoughtful and rational examination of the NRC's regulatory framework with the information and lessons learned resulting from the instance in Japan."

Jaczko's Call On Fukushima Radiation Plucks US Regulator From Obscurity (BLOOM)

By Jim Efstathiou Jr. And Simon Lomax

Bloomberg News, March 22, 2011

Investors seeking some direction on the potential severity of Japan's nuclear crisis got it from a person most probably hadn't heard of until last week.

"We believe that the secondary containment has been destroyed and there is no water in the spent-fuel pool," Gregory Jaczko, chairman of the US Nuclear Regulatory Commission, said at a congressional hearing on March 16. "We believe that radiation levels are extremely high."

Stocks fell from the US to Russia, with the Standard & Poor's 500 Index ending the day down 2 percent. Currencies including the Australian dollar and Indonesian rupiah also fell, along with crude oil and copper. Market commentaries for an array of investments cited Jaczko's remarks.

Japan's nuclear crisis has thrust the agency that regulates US atomic power plants into the spotlight. Policy makers and financial markets alike are listening to its chairman, a 40- year-old native of upstate New York who associates say has been one of the most aggressive advocates of nuclear safety on the five-member commission.

Some lawmakers "probably might have had trouble telling you what NRC stood for" before the crisis in Japan, said Kevin Cook, a former senior Republican aide on the House Appropriations Committee. "Now it's taken a much higher profile," Cook, now a Prescott, Arizona-based energy consultant, said in an interview.

On the same day he testified to Congress, Jaczko briefed President Barack Obama on conditions at the Fukushima Dai-ichi nuclear plant. Based on his assessments, the US Embassy in Japan ordered that American citizens stay 50 miles (80 kilometers) from the reactor complex. Japanese officials had ordered an evacuation to about 12 miles away.

While the Associated Press said Japanese officials denied that the cooling pond at one of the reactors had dried up, a condition that could cause spent fuel rods to ignite and release radiation, Jaczko stood by his comments then, and again yesterday on C-Span.

"I really can't say that I have views on nuclear power or the nuclear industry," he said. "I have views on nuclear safety." His conclusion was based on reports from NRC experts on the scene, he said.

Attention on Jaczko and his commission will continue this week, starting with a public briefing on Japan today at the agency's headquarters in Rockville, Maryland, north of downtown Washington. Hearings are scheduled on reactor safeguards on March 24.

The crisis at the Japan plant may be "on the verge of stabilizing," Bill Borchardt, the NRC's executive director of operations, said at today's briefing.

The NRC, created by Congress to regulate nuclear safety in 1974, hasn't been as vigilant as its chairman might wish, said Representative Dennis Kucinich, an Ohio Democrat.

"He impresses me as someone who wants to do the right thing and of course the NRC has a tradition of not so much being a stern taskmaster of the industry," Kucinich said.

Jaczko, who declined through a spokesman to be interviewed, was nominated to the NRC in 2005 by President George W. Bush and named chairman by President Barack Obama in 2009. He earned a bachelor's degree in physics and philosophy at Cornell University in Ithaca, New York, before completing a doctorate in physics at the University of Wisconsin at Madison, according to the NRC.

Before joining the NRC, Jaczko was science adviser to current Senate Majority Leader Harry Reid, a Nevada Democrat, and worked for Representative Edward Markey, a Massachusetts Democrat and critic of nuclear power.

Jaczko has been on the losing side of NRC votes to strengthen safety measures, said Edwin Lyman, a physicist and expert on nuclear plant design at the Cambridge, Massachusetts-based Union of Concerned Scientists.

Greater exposure as a result of the crisis in Japan may translate into more pressure from Congress as the NRC prepares to rule on new nuclear reactor designs this year, Lyman said.

Last year, Jaczko ordered the NRC's staff to stop considering a proposed nuclear waste repository at Yucca Mountain, Nevada, a move that angered Republican lawmakers who say he overstepped his authority. Reid, Jaczko's former boss, was a vocal critic of the Yucca Mountain plan.

The NRC is "under tremendous pressure on the Hill as well as from industry to accelerate licensing actions," Lyman said yesterday on a conference call with reporters.

Jaczko said on C-Span yesterday that the NRC should be able to complete its review of failures at the crippled Fukushima plant before reaching a decision on new reactor licenses in the US. He compared the commission's work to its review of security measures at nuclear plants after the Sept. 11 terrorist attacks, which led to a requirement that operators add backup equipment to cool reactors and spent fuel pools.

"We think we have programs in place that would deal with the kinds of situations that we're seeing in Japan," he said on C-Span.

The crisis at the Fukushima plant began after it was struck March 11 by an earthquake and tsunami. The natural disasters knocked out backup generators needed to power systems to keep cool reactor fuel and spent nuclear fuel stored on site.

There are about 100 similar storage pools at about 60 sites in the US, said Robert Alvarez, a senior scholar at the Institute for Policy Studies and a former policy adviser to the US Energy Department.

A major test of the NRC will be how the agency addresses the issue of spent fuel storage, Alvarez said. Jaczko, who Alvarez characterized as "a straight shooter," may end up in the minority, he said.

"Even though he's chairman, there are other commissioners and he's just one vote," Alvarez said in an interview. "In order to fill seats on that commission, you have to get the OK from the nuclear industry."

Nuclear plant operators had misgivings about Jaczko when he joined the NRC and then became chairman, Kai Anderson, who served with Jaczko on Reid's staff, said in an interview. Jaczko was considered an "aggressive regulator," said Anderson, now a lobbyist at Cassidy & Associates in Washington.

"He's going to be the best thing that's happened to them in the last couple of decades because he's actually a real regulator," Anderson said. "If Greg Jaczko tells me something's safe, I believe him."

Martha Coakley Asks Feds To Re-examine Nuclear Storage (AP)

By Associated Press

Associated Press, March 22, 2011

BOSTON — Massachusetts Attorney General Martha Coakley is urging federal energy officials to re-examine the safety of the wet storage of spent fuel at nuclear power plants, including the Pilgrim Nuclear Power Station in Plymouth.

In a letter sent Monday to Energy Secretary Steven Chu and Nuclear Regulatory Commission Chairman Gregory Jaczko, Coakley said federal regulators need to take another look at the wet storage protocol, which is also used at the Vermont Yankee nuclear plant near the Massachusetts border.

It was also used at the damaged Fukushima Dai-ichi plant in Japan.

Coakley said federal regulators need to rescind their finding that wet fuel storage doesn't create an environmental risk, given the problems at the Japan nuclear power plant in the wake of an earthquake and tsunami.

"Despite our continuous advocacy for the NRC to consider alternative storage at these plants, the NRC has refused to do so, saying the risk of breach or fire is 'insignificant,'" Coakley wrote. "The event in Japan shows that such a breach can occur, and we are asking the NRC to revisit that assessment."

She said the NRC should consider mandating dry cask storage for spent fuel. She said the NRC has declined to release the full studies that they have used to argue that wet fuel storage is safe.

President Barack Obama has ordered a comprehensive review of US nuclear plant safety.

Coakley also said that she's "deeply concerned" that the federal government hasn't fulfilled its obligation to begin removal of nuclear waste in 1998, as required by the Nuclear Waste Policy Act of 1982. She said energy customers, including those in Massachusetts, have paid into the fund, which now totals \$24 billion.

The letter from Coakley was also signed by Massachusetts Senate President Therese Murray, whose district includes Plymouth.

Operators Of Indian Point Say Changes Are Likely (NYT)

By Patrick McGeehan

New York Times, March 22, 2011

WHITE PLAINS — The operators of the Indian Point nuclear power plant said Monday that they did not expect ever to face the combination of earthquake and flooding that devastated Japan this month. But in the aftermath of those disasters, they said, some regulatory changes were to be expected.

Executives of Entergy, which owns Indian Point, told the Westchester County Board of Legislators' Environmental and Energy Committee at a meeting here that it was too soon to know what should be done differently at the plant. They said they did not foresee a natural disaster of the same magnitude in the New York area; the plant is on the Hudson River in Buchanan, 35 miles north of Midtown.

But, they said, they did expect regulators to insist on some changes after the damage done to the Fukushima Daiichi Nuclear Power Station in Japan.

"I have no doubt there will be changes we make in response to this event," said John McCann, vice president of nuclear safety and licensing for Entergy. But, he said, he was "in no position" to say what they would be.

Mr. McCann reassured the legislators that Indian Point had been designed to withstand an earthquake much stronger than any on record in the region, though not one as powerful as the quake that rocked Japan. He said repeatedly that the greater threat to public safety in Japan had come not from the earthquake, but from the tsunami.

It was the tsunami, he said, that washed away the tanks of fuel for the emergency generators and left the Japanese unable to keep the plant's reactors cooled. Indian Point has several sources of power and water that should preclude a similar situation there, he said.

Even if all sources failed, he added, there were "severe-accident-management" plans drawn up, calling, for instance, for water from the Hudson to be pumped to the plant to keep the fuel rods and spent fuel rods from overheating.

But Michael B. Kaplowitz of Somers, chairman of the environment committee, asked, "How can you test that?" Mr. Kaplowitz wondered aloud if the plan amounted to calling in a "fire brigade" to pump water onto the rods to prevent a meltdown.

The Entergy executives said they had been storing spent fuel rods in 10 "dry casks" on concrete pads. The casks, they said, were designed to withstand the degree of shaking that would accompany an earthquake of magnitude 6.0 on the Richter scale, the same level, they said, that the plant could handle.

Some of the legislators seemed more worried about the plan for evacuating the area around Indian Point, especially after the Nuclear Regulatory Commission recommended that people in Japan stay at least 50 miles away from the crippled Fukushima

plant. The existing evacuation plan for Indian Point adheres only to the current federal standard of a 10-mile radius around a nuclear plant.

One legislator, Peter B. Harckham of Katonah, recalled having been among those evacuated after the accident at the Three Mile Island nuclear plant near Harrisburg, Pa., in 1979. "I can just tell you, it didn't work," he said. "It took us well over four hours to go a short distance."

Another legislator, William Burton of Ossining, said that he shared with his neighbors "a not-unreasonable fear of not being warned soon enough" of trouble at Indian Point.

"As soon as the siren goes off, I'll jump in my car and I'll be in gridlock on 9A before things start," he said, referring to a highway that runs along the Hudson.

Despite the advice the federal regulators gave to people in Japan, the Entergy executives expressed doubt that the evacuation zone would be expanded to reach as far as New York City. Asked if a feasible plan to evacuate much or all of the city could be drawn up, Entergy's director of emergency planning, Michael J. Slobodien, said neither he nor the federal regulators knew.

"We really don't have enough information to begin to answer that question," Mr. Slobodien said. He said the idea that regulators would demand an evacuation plan for an area beyond 10 miles was "rank speculation."

US Nuclear Plants Are Safer Than Japan's, But Operational Quality Needs Work (CWIRE)

By Peter Behr

ClimateWire, March 22, 2011

Are US nuclear reactors safe?

The short answer is "yes," Nuclear Regulatory Commission Chairman Gregory Jaczko tried to convey to anxious, impatient senators at a congressional hearing last week. The nation's chief nuclear regulator could give no other answer – an unsafe reactor would have to be shut down and fixed, or closed.

Taken as a whole, the 104 US commercial nuclear reactors have significantly improved their operating reliability and are more closely watched by on-site NRC inspectors and regional staff than in any other time in the industry's half-century history, according to NRC. From the 2005 to 2009 fiscal years, NRC recorded no "abnormal occurrences" – accidents or deficiencies that caused a major reduction in the protection of public health and safety.

The median measure of nuclear plant outage time and power reductions from equipment failures and human error was 1.2 percent in 2009. The figure exceeded 5 percent in the mid-1990s, according to the industry's Nuclear Energy Institute.

Behind that solitary "yes" to the question of safety, however, are caveats, conditions and footnotes that help fill NRC's enormous document library, addressing such crucial underlying questions: "how safe?" and "safe from what?"

Nuclear plants are considered the most sensitive, fault-intolerant industrial complexes that exist and the consequences of the worst-case failure of systems or equipment in emergencies can be catastrophic. A report last week by the Union of Concerned Scientists, an industry watchdog and critic, described a relative handful of cases in NRC records documenting startling operating errors that caused emergency reactor shutdowns and instances where emergency equipment failed to work. In some cases, the causes of problems had been known for months or years without correction, the report said.

"The reality is that equipment can sometime fail. Humans can make mistakes, and these are complex machines," said Anthony Pietrangelo, chief nuclear officer of the NEI. But the overall industry's performance, based on safety indicator benchmarks, is at or exceeding all-time highs, he said. The industry owners understand better than anyone the consequences of a serious failure, he said.

Charles "Chip" Pardee, chief operating officer of Exelon Generation, the largest US nuclear plant operator, acknowledged the operating challenges to the audience at this month's NRC-sponsored conference for nuclear operators. "We have entered a period where we have allowed ourselves perhaps a bit to stray from the basics of high-quality operations, such as quality operator – control room teamwork, the basic processes by which we operate our power plants 24 hours a day, seven days a week.

"We don't have the quality that we should have when we're out fixing or replacing equipment in our power plants. And associated with that is quality of repairs that that we're able to procure right now. ... We have too many premature [equipment] failures. All those are a high priority for industry," he said.

Addressing the fears from Fukushima

Today, the NRC staff will brief the commission on the staff's response to the worst such crisis in a quarter century – the devastation to the Fukushima Daiichi nuclear complex in Japan, which propelled fears and issues about nuclear power safety to the front of the world's consciousness.

NRC addressed those fears Friday in a unusual "information notice" to reactor operators that was released to the public to document the actions taken to strengthen US reactors after the Sept. 11, 2001, terrorist attacks. The possibility of a suicide attack on a nuclear reactor by terrorists in a seized commercial jetliner had never been part of the reaction protection scenarios, officials said then, and NRC ordered measures to protect reactors, control rooms and spent fuel storage pools against the conflagrations that could cause.

Those actions mark a difference between US reactors and Japanese counterparts of the same design, NRC says.

In response to the 9/11 order, issued in 2002, all US reactor licensees have verified their ability to "mitigate conditions that result from severe adverse events," including the loss of crucial operating and safety systems due "natural events, fires, aircraft impact and explosions," NRC said.

The plants can withstand a total loss of electric power – the "station blackout" condition that crippled the reactor and spent fuel cooling systems at Fukushima. And the plants are adequately protected against flooding from inside or outside the plant and have developed strategies for dealing with potential earthquake damage to critical facilities, the NRC statement said.

NRC and the NEI have noted that the GE Mark 1 design reactors at the Fukushima complex were retrofitted in the United States and installed with hardened vents that would remove hydrogen that escaped the primary reactor containment shell and carry it outside the second containment building. The Japanese reactors lacked that retrofit, Pietrangelo said, and so vented hydrogen collected inside the secondary containment buildings in Units 1 and 3, where it eventually exploded. The US reactor owners made the retrofits, and had they not, NRC would have ordered it, Pietrangelo said. "That's just one example," he said.

The Union of Concerned Scientists agreed last week that changes since 9/11 have indeed strengthened US reactors. "[T]here are more temporary generators, backup generators and firefighting capabilities than we had prior to 9/11," said David Lochbaum, UCS director of nuclear safety.

"While many of our plants may not be vulnerable to the one-two punch of earthquake and then tsunami, many of our reactors are in situations where earthquakes or hurricanes in the Gulf or ice storms in the Northeast or a tree in Cleveland can cause an extensive blackout that puts us in a very similar situation," he said.

Concern about spent fuel ponds

The area of greatest concern is the capacity of backup batteries at US reactors, which in many cases, can last four hours, half as long as most of the batteries at the Fukushima plant, Lochbaum said. The US plants may be able withstand what happened in Japan if battery capacity is increased, he said. "That's a question that remains to be answered."

The pools at the General Electric Mark 1 reactors, implicated in Japan's crisis, are at the top of the reactor building. Other reactor designs place the pools at ground level, where "they're less vulnerable to either acts of nature or acts of malice," according to Lochbaum.

"If I was king for the day or maybe for the week, the first thing I'd change would be our spent fuel pools in the reactors like the one in Japan [which] are almost filled to the brim," Lochbaum said. "And the risks from the spent fuel pools, either from an accident or from an act of malice, are about as high as you could possibly make them."

The new measures ordered by NRC include additional safeguards for the spent fuel pools, including means of adding makeup water and spraying water on spent fuel, two of the desperate measures Japan's Self-Defense Force has used to control radiation from exposed spent fuel at the Fukushima complex. NRC has issued confidential directives on handling spent reactor fuel on a case-by-case basis, but the 23 Mark 1 reactors in the United States still have their spent fuels "in the attic," Lochbaum said.

The actions to strengthen reactors noted in NRC's information notice Friday took years to complete and verify. NRC ordered the additional measures in February 2002. In December 2006, after completing plant assessments, the NEI issued guidelines for meeting the NRC requirements, and the NRC staff endorsed these strategies.

It took until December 2008 for the NRC staff to verify that all of the reactors were in compliance, NRC said.

The response by the industry and its regulator demonstrate the reality that protecting reactors is a function of judgment and economics, Lochbaum said in a phone briefing for reporters last week. Judgment determined how severe a threat reactors must be ready to withstand. Economics plays a crucial part in how far regulators go in demanding safety measures.

Lochbaum said that his predecessor at UCS, Bob Pollard, "used to say that he has no doubts in his mind that you could design and operate an inherently safe reactor, and he has no doubt in his mind that he could – you could design and operate an inherently economic reactor. Where doubts arose was where you tried to do both. You could design a reactor to be bullet-proof, but nobody's willing to pay for it. So, that's the challenge."

Jaczko described to senators the NRC process that assess natural disaster threats to reactor plants, a methodology based on historical worst-case threats, which adds a substantial margin of protection over that. When new information is received, the

calculation is repeated. For example, new data about earthquake severity in the central and eastern US has been compiled by the US Geological Survey and will be used to re-evaluate hazards facing plants. If action is needed, it will be taken, NRC says.

The judgment factor in assessing risk remains, however. One extreme example reviewed recently by the Federal Energy Regulatory Commission, centers on the extreme peril of a once-in-a-century solar flare – a geomagnetic storm – that if large enough, could disable large sections of the power, leaving reactors dependent upon diesel-fired backup generation. In that emergency, would the power outage prevent fueling depots to replenish diesel fuel to keep emergency systems working at the nuclear plants until the grid's power could be brought back up? Is that risk considered too remote to be included in the threat scenarios reactors must be prepared to survive?

Building safer new reactors

The spurt of new reactor construction around the world – including two US projects whose developers are anticipating NRC license approval – involved new reactors that are generally considered to be safer than the 40-year-old designs built during the nuclear industry's expansion in the 1960s and '70s.

Some experts believe that the reactors designed by France's Areva SA are the safest of the new designs because of the additional redundancy of safety measures and emergency systems, including four emergency response systems and a "core catcher" structure that is meant to capture and spread out molten nuclear fuel that burned through the reactor vessel to prevent a resumption of a chain reaction.

Areva was jolted in 2009 by the loss of \$40 billion contract to build new reactors in the United Arab Emirates, which selected a less expensive design from Korean Electric Power Co. Following last week's Japanese crisis, Areva CEO Anne Lauvergeon stressed the high safety standards of Areva's new EPR reactor and its ability to survive earthquakes and plane crashes, noted a report last week in MarketWatch. She told reporters that the EPR would have withstood the 9.0 quake in Japan and the tsunami without leaking. "At one time, the EPR was criticized for being too safe. Today with the Fukushima catastrophe that is over," she said.

The NRC's role, however, is to determine whether each proposed reactor design that comes before it is safe, not to assess which design is safest, and make that the standard for approval.

While new designs are seen as safety that the older US reactors, the older models have not remained unchanged.

NRC's Jaczko was pressed last week by Sen. Frank Lautenberg (D-N.J.) about the relatively safety of the GE Mark 1 plant and tried to explain that there have been several significant safety improvements to the original design. Moreover, all of the older US reactors are undergoing a constant replacement of pumps, valves, piping, electronics, turbines, steam units and even reactor vessel heads.

Jaczko tried to make an analogy to aircraft that are refitted to keep flying (perhaps thinking of the Air Force B52 bomber, some of which are still in service a half-century after production stopped), but Lautenberg dismissed that reasoning, chastising Jaczko for "poor judgment."

In fact, US reactors undergo changes not merely to retrofit old equipment but to expand the capacity of old plants.

Changes that increase the capacity of existing plants

NRC's website reports that as of January 2008, the commission had approved 116 uprates, resulting in a gain of about 5,200 megawatts capacity – equivalent to more than five new reactors. Applications for another 5,000 megawatts of uprates are anticipated, according to an October 2009 review in Power Electronics – equivalent to another five new reactors. The US nuclear "renaissance" thus far is largely a case of renovation.

Uprates require new equipment and so does extending the lives of the existing reactors. The changes can improve safety by exchanging older equipment for improved new versions. But they create opportunities for errors by installers and contractors.

Of the 104 US commercial nuclear reactors, 62 have been approved to operate for an additional 20 years beyond the initial 40-year license period and most of the rest are expected to seek license renewals, including the Diablo Canyon plant near San Luis Obispo, Calif., which faces threats from onshore and offshore seismic faults.

The NRC staff of 4,000 is required to assure continued safe operations in passing on applications for relicensing and uprates, at the same time that it reviews safety of new designs, sites for new reactors and oversees the hour-by-hour safety performance of existing reactors. While its staff has grown substantially, half have been at NRC less than five years.

NRC documents significant operating "incidents" that its on-site inspectors find or that the reactor owners self-report, and if a pattern of issues appears, the NRC staff will impose steadily increasing inspection requirements, coupled with publicly reported grades on compliance.

The Union of Concerned Scientists and other NRC critics say that the federal commission does not come down hard enough on safety violations. "It isn't their fault," Lochbaum maintains. When NRC leans too hard, members of Congress step in,

complaining, "You are going to put these guys out of business." So, the NRC, since their budget is controlled by the United States Congress, they listened," he said. NRC and the industry strongly disagree.

The industry's fear of another Three Mile Island accident, and NRC's increased attention, contribute to the outage rate approaching 1 percent from equipment failures and human mistakes, NEI says. The question in the aftermath of the Japanese reactor is crisis is, "Is that good enough?"

US Reactors Vulnerable In Event Of Japan-scale Crisis (REU)

By Deborah Zabarenko

Reuters, March 22, 2011

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

Japan's Nuclear Crisis Reignites Safety Debate (USNEWS)

By Jessica Rettig

US News and World Report, March 22, 2011

Some lawmakers are urging the domestic nuclear industry to use the Japanese tragedy as a real-life lesson on safety. "We have a lot of nuclear plants right here, and some of them are very much the same as what they have in Japan," says California Democratic Rep. Henry Waxman. "Japan is a technologically capable country, and they anticipated earthquakes and tsunamis, but still they didn't have all the failsafes to stop this tragedy from occurring. So, we need a full inquiry as to how this happened, why it happened, what we can do to build in security features in the United States. Until that happens, we ought to step back from the direction that Republicans are taking, which is heavily reliant on nuclear."

On Friday, Vermont Democratic Sen. Bernie Sanders wrote a letter to the president urging him to issue a moratorium on all NRC licensing and re-licensing decisions.

Nuclear Energy Institute spokesman Tom Kauffman says the nuclear industry has reason to remain confident that plants within the United States are safe. "All of our plants—whether they're on the [West] Coast or in the eastern part of the country—each plant is constructed to withstand the maximum projected earthquake at that site. It's a site-by-site situation that is revisited on a regular basis," says Kauffman. "There's going to be changes, but there's still going to be growth."

With 104 operating nuclear plants in the United States, nuclear power makes up approximately 20 percent of the total US energy profile. As an arguably cleaner alternative to coal, gas, and oil, nuclear energy has gained bipartisan support in recent decades, especially as plants proved their safety. But the industry has faced an uphill battle, says Ferguson, even before the Fukushima plant began to break down. It has been more than three decades since construction began on a new nuclear power plant in the United States. The nuclear industry ascribes this to lack of financing, regulatory obstacles, and concerns over safety. [Take the US News poll: Should the US put a hold on building new nuclear power plants?]

Several lawmakers emphasized their commitment to nuclear power on Capitol Hill last week as they questioned federal experts on the safety of domestic plants. President Obama also continues to support nuclear energy, maintaining his request to Congress for \$36 billion in loan guarantees for nuclear projects in next year's budget. Energy Secretary Steven Chu on Wednesday told Congress that the administration would wait to see what can be learned from Japan before halting the growth of nuclear power.

According to Kauffman, there are two reactors nearing construction in Georgia and another pair in South Carolina. Both have been designed using advanced "passive" safety mechanisms, unlike the "active" safety mechanism that failed in Japan. With the newer technology, the plants employ automatic cooling mechanisms that do not rely on external energy sources to keep the fuel rods stable.

Around the world, countries fearful for their own plants' integrity have pulled back operations at nuclear facilities. Germany, for example, announced that they would shut down plants that began operating before 1980. The European Union, which still remembers the world's greatest nuclear disaster to date in 1986 at Chernobyl, vowed last week to perform "stress tests" on nuclear plants there. And China, which had planned to increase its nuclear power seven-fold in the next decade, has pledged to stall approvals for pending nuclear projects. There has also been a run worldwide on potassium iodide pills, which help guard against the adverse health effects of radiation.

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why it happened, what we can do to build in security features in the United States. Until that happens, we ought to step back from the direction that Republicans are taking, which is heavily reliant on nuclear."

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NEWS ANALYSIS: Japan Crisis Puts Global Nuclear Expansion In Doubt (PLATTS)

Platts, March 22, 2011

The crisis at Japan's Fukushima nuclear plants has prompted leading energy-consuming countries to review the safety of their existing reactors and cast doubt on the speed and scale of planned expansions around the world.

The events at the Fukushima-1 plant already rank as the worst nuclear incident in the world since the Chernobyl disaster in what is now Ukraine in 1986, and have renewed public fears about the safety of nuclear power.

The emergency comes at a critical time for the industry, with governments in most of the world's biggest economies looking to build new nuclear power plants as they seek to build new baseload generation capacity without increasing carbon emissions.

In China, the government ordered safety inspections of the country's existing nuclear plants and suspended approval of new projects.

China operates 13 nuclear plants and is building more than two dozen others, putting it at the center of the global expansion of nuclear power.

Further ahead, the country has plans for another 50 or more plants as it struggles to meet soaring demand for energy.

In India, the government has ordered safety checks at its existing plants but has not ordered a rethink of ambitious expansion plans.

"China and India will lead in the global construction of more than 80 GW over the next decade. As a minimum, we expect this incident will slow expansion plans while lessons are learnt. In a more extreme scenario, there could be a public backlash against nuclear power which could substantially reduce the planned build out," Bernstein Research analysts said last week.

GERMAN CLOSURE

One of the most immediate reactions to events in Japan came from Germany, where Chancellor Angela Merkel's government announced the temporary closure of the country's seven oldest nuclear reactors, with a combined capacity of 7 GW.

The reactors are being taken off line within the framework of a three-month moratorium on lifetime extensions in the Nuclear Energy Act. Passed in October 2010, the law extends the lifetimes of the seven reactors commissioned before 1980 by eight years, and newer reactors by 14 years.

Widely criticized as unconstitutional, the moratorium may have to be followed by an amendment to the law.

German public opinion was already hostile to the idea of new nuclear plant, and the country was looking to gradually replace existing nuclear capacity with renewables.

Switzerland moved as swiftly as Germany in taking action. On March 14, Swiss President and Energy Minister Doris Leuthard said authorization processes for three new reactors would be put on hold while safety standards were checked and, if necessary, revised. Existing plants will also be re-examined, she said.

"In Japan there are two problems: the age of the reactors and the emergency systems. The situation is very similar in Switzerland. The damaged reactors in Japan are from the same generation as Muhleberg and Beznau. Fukushima-1 is more or less the same type of reactor as our 40-year-old Muhleberg," said Walter Wildi, a former president of the Swiss Nuclear Safety Inspectorate.

There was a cautious reaction from the UK, where the government is hoping nuclear power will play an increasingly important role in generating low-carbon electricity.

UK REPORT

UK Energy and Climate Change Minister Chris Huhne called on chief nuclear inspector Mike Weightman to draw up "a thorough report on the implications of the situation in Japan and the lessons to be learned."

A draft, to be prepared in cooperation internationally with other nuclear regulators, is to be produced by mid-May and a final report by September.

"It is essential that we understand the full facts and their implications, both for existing nuclear reactors and any new program, as safety is always our number one concern," said Huhne.

In evidence to the Climate Change Committee on market reform, Huhne was critical of politicians elsewhere in Europe rushing to judgement, but recognized the Japanese disaster could damage investor appetite for nuclear, and was wary an over-reaction could increase costs of new build unnecessarily.

"France and the UK, the two EU countries where new nuclear plants are due to be operating this decade are, due to their geography, more protected from such natural disasters and therefore the new build program is unlikely to stop," Citi said in a report last week.

"In Germany, where a law extending nuclear lives was approved last year but faced strong opposition from the public and is being challenged by state governments, the anti-nuclear sentiment could intensify further," it said.

In the US, President Barack Obama has ordered the Nuclear Regulatory Commission to conduct a "comprehensive" safety review of nuclear power plants.

Obama told a press briefing the US had gone through "exhaustive studies" to ensure safety under natural disasters, but that it could nonetheless learn from the crisis in Japan.

LONG-TERM IMPLICATIONS

Although global nuclear expansion plans may get back on track, some analysts suggest the Fukushima disaster will have long-term implications.

Bernstein said it could prompt a longer-term shift to gas, with the world buying an additional 25-50 million mt/year of LNG, on top of the doubling of LNG requirements from 200 million mt/year to 400 million mt/year over the next decade to 2020.

"The only low carbon fuel which can compete with nuclear power in baseload power generation is natural gas. As a result of this incident, we expect that gas-fired power generation will grow more quickly than expected," Bernstein said.

Despite the challenges, global efforts to combat the negative effects of climate change cannot succeed unless nuclear power is part of world's mix of electricity generation, Societe Generale said in a report.

It said that in addition to 442 operational reactors around the world, 103 GW of new nuclear power is expected to come online before 2020 and 162 GW before 2030.

"Nuclear is seen by many only as a 'bridge' to the future zero-emission power technologies to be developed and made economical for large scale deployment. But this bridge is necessary," the bank said.

NRC Plans Meetings To Discuss Reactors In N.Y., S.C. (GWIRE)

By Hannah Northey

Greenwire, March 22, 2011

Federal regulators plan to discuss the safety of two controversial nuclear power plants in meetings this week.

The Nuclear Regulatory Commission is holding the meetings ahead of a safety review of the country's 104 nuclear reactors ordered last week by President Obama in the wake of a massive March 11 earthquake and tsunami that crippled reactors in northeast Japan on March 11 (E&ENews PM, March 17).

At issue for NRC this week: Entergy Corp.'s Indian Point Power Plant, which is on the Hudson River about 25 miles north of New York City, and Progress Energy Inc.'s H.B. Robinson Nuclear Plant, near Hartsville, S.C.

"After watching the events in Japan and having previously opposed the Indian Point plant, this past Tuesday, I requested the White House schedule a meeting between my staff and senior members of the Nuclear Regulatory Commission," New York Gov. Andrew Cuomo (D) said in his March 19 online statement. Cuomo said the meeting is scheduled for tomorrow.

New York Attorney General Eric Schneiderman (D) last week called for NRC to take into account seismic activity in the region before relicensing the 40-year-old Indian River plant (E&ENews PM, March 18).

Entergy is asking NRC to renew licenses for Indian Point's Unit 2 and Unit 3 for another 20 years. Current licenses expire in 2013 and 2015, respectively.

NRC is holding a separate meeting in South Carolina on Thursday to discuss the Robinson nuclear plant. The agency says the single-unit 710-megawatt pressurized-water reactor operated safely last year, but the NRC staff is increasing its oversight and inspection there because the facility exceeded the threshold for unplanned shutdowns in the third quarter.

Inspections also generated three findings of "low to moderate safety significance," including Progress Energy's failure to correct a problem with an emergency diesel generator and failure to adequately design and start operator training associated with reactor coolant pump seals.

"The NRC evaluates nuclear power plants in a systematic and detailed way each year," NRC Region II Administrator Victor McCree said in a notice posted on the agency's website. "These reviews and the additional inspections and oversight at Robinson will ensure that the plant is operated in a way that protects people near the plant and the environment."

The nonprofit Union of Concerned Scientists released a review of US power plant safety concerns Thursday that pointed to fires and equipment malfunctions at the Robinson and Indian Point plants (ClimateWire, March 18).

The report highlights 14 significant safety-related events at the plants that it said occurred because reactor owners and regulators "tolerated known safety problems."

Despite Calls To Slow Down, NRC Grants Vt. Renewal (AP)

Associated Press, March 22, 2011

MONTPELIER, Vt. (AP) – Federal regulators on Monday gave the Vermont Yankee nuclear plant a 20-year license renewal, despite calls for reconsideration following the nuclear disaster in Japan.

Issuance of the license was a foregone conclusion after the NRC voted to approve it on March 10, one day before an earthquake and tsunami triggered the still unfolding crisis at the Fukushima reactors in northeastern Japan, which are of the same design and about the same age as Vermont Yankee.

Vermont Yankee spokesman Larry Smith said officials there and with the plant's parent company, New Orleans-based Entergy Corp., were pleased to have the license in hand. But he added, "It's not a cause right now for any celebration in light of world events."

"I think the NRC has done their job," Smith added. "This has been a five-year review. There's been ample opportunity for people to weigh in."

The license renewal was granted a year to the day before Vermont Yankee's initial 40-year license was to expire. The plant still must be relicensed by the state, but the Senate last year rejected the idea, leaving its future uncertain.

The renewal was the first granted by the NRC since events in Japan began to unfold 10 days earlier.

Sen. Bernie Sanders, I-Vt., had issued a statement Sunday calling for a moratorium on new licenses or license renewals for US reactors in the wake of the Japanese crisis.

"It's hard to understand how the NRC could move forward for a license extension for Vermont Yankee at exactly the same time as a nuclear reactor of similar design is in partial meltdown in Japan," Sanders told The Associated Press. "The idea of keeping Vermont Yankee open... until it is 60 years of age defies comprehension."

Vermont Yankee, which operations in 1972, is located in Vernon, in Vermont's southeast corner, within sight of New Hampshire across the Connecticut River and about three miles from the Massachusetts line. It's a General Electric Mark 1 boiling water reactor, as are the Fukushima reactors.

Entergy bought Vermont Yankee in 2002 from the group of New England utilities that had owned it and boosted its power output in 2005.

Vermont Yankee announced in January of 2010 that test wells had turned up evidence that radioactive tritium had leaked from underground pipes at the plant into surrounding soil and groundwater. Within days it was revealed that plant executives had misled state lawmakers and regulators – the latter under oath – by saying the plant did not have the type of underground pipes that carried radioactive substances.

Vermont is the only state in the country with a law calling on its Legislature to give the go-ahead before state regulators issue the state permit the plant also needs to operate past March of 2010. A month after the revelations about the tritium leaks, the state Senate voted 26-4 against allowing the plant to renew its state permit. After the Senate killed the measure, it never went to the House.

Vermont Nuke Plant Gets Federal OK For 20-Year Renewal (AP)

By Dave Gram, Associated Press

Associated Press, March 22, 2011

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Sanders Asks Obama For Moratorium On License Renewals For Nuclear Plants (VTD)

Five-Point Emergency Plan Also Calls for Independent Probe

VTDigger, March 22, 2011

BURLINGTON, Vt., March 20 – In the aftermath of the nuclear disaster in Japan, US Sen. Bernie Sanders urged the White House to form a presidential commission on nuclear safety in the United States as part of a five-point crisis response.

In a letter to President Barack Obama, Sanders (I-Vt.) also asked for a moratorium on license renewals by the Nuclear Regulatory Commission. He said the White House should withdraw a request for \$36 billion to bankroll building new nuclear

plants. He questioned why taxpayers – not nuclear plant owners – are on the hook for damages in the event of a meltdown or other accident at a private power plant. And he said states should get more say on plant safety.

Sanders serves on the Senate committee that oversees the NRC, the federal agency that regulates commercial nuclear reactors in this country.

One day before the massive earthquake and tsunami struck Japan, the NRC authorized a 20-year extension for the Vermont Yankee reactor in Vernon, Vt., after its 40-year operating license runs out next year. Days later, at a committee briefing on the Japan crisis, Sanders urged NRC Chairman Gregory B. Jaczko to reconsider that decision.

At the Senate Environment and Public Works Committee briefing and in his letter to Obama, Sanders said it is disturbing that 23 reactors in the United States, including Vermont Yankee, are virtually identical in design to the crippled reactors at the Fukushima Daiichi plant in Japan. Federal safety officials have criticized the General Electric design and warned as long ago as 1972 that if the cooling systems ever failed and fuel rods overheated then the containment vessel surrounding the reactor probably would burst, spewing dangerous radiation into the environment.

Sanders' letter to Obama called for:

- + An independent review by a special presidential commission with broad authority and a mandate to independently review the safety of every existing nuclear reactor and waste site in the United States, in light of the lessons that may be learned from the situation in Japan.

- + A moratorium on all licensing and re-licensing decisions by the NRC. China already is conducting a full review of safety at its nuclear plants and halted new construction. Germany closed seven reactors to review safety. In this country, New York Gov. Andrew Cuomo wants to shut down the Indian Point nuclear plant, which is operated by Entergy, the same company that runs Vermont Yankee.

- + Repealing a federal law that indemnifies the nuclear industry. "In the event of a nuclear tragedy in the United States, should the taxpayers of this country be asked to provide billions of dollars in compensation to the victims of such a tragedy or, in a free-enterprise society such as ours, should the nuclear industry itself take full responsibility to secure insurance in the private market for all consequences of such an unthinkable tragedy?" he asked.

- + Withdrawal of an Obama administration request for \$36 billion in new lending authority to build more nuclear power plants. Instead, Sanders said existing nuclear loan guarantee funds should be redirected to enhance energy efficiency and to develop safer, more cost-effective energy sources such as solar, wind, biomass, and geothermal.

- + Giving states a say on the safety of nuclear plants. "It will be people who live in the vicinity of nuclear power plants who will have to bear the burden of any tragedy that might occur, and for this reason alone they should play a meaningful role in deciding whether or not the safety risk is acceptable," Sanders wrote.

Sanders commended Obama for providing assistance to Japan as it grapples with the consequences of the natural disaster and nuclear crisis. "It is clear that at the same time we do everything we can to provide such assistance, we have an obligation to learn from this catastrophe and respond accordingly. The proposals I have put forward would ensure that the United States begins a long-needed, thoughtful and critical reconsideration of the safety of our nuclear reactors, and the wisdom of moving forward with a spate of new reactors."

Contact: Michael Briggs (202) 228-6492.

NRC Issues New License For Yankee (BRATBORO)

Brattleboro (VT) Reformer, March 22, 2011

BRATTLEBORO – Just past 11 a.m. this morning, the Nuclear Regulatory Commission issued a new 20-year license for Vermont Yankee nuclear power plant in Vernon.

The issuance of the renewed operating license is the culmination of an NRC review process that began with the submittal of the application for a 20-year license extension on Jan. 27, 2006.

The NRC staff had earlier completed its environmental assessment in August 2007 and safety evaluation in February 2008 for the application.

The independent Advisory Committee on Reactor Safeguards (ACRS) also reviewed the proposal during meetings in 2007 and 2008. Then, on March 10, the Commission addressed the last remaining contention in the hearing process on the application, when it dismissed an appeal from the New England Coalition.

Vermont Yankee Has 20-year Extension License In Hand (BOS)

By Beth Daley, Globe Staff

Boston Globe, March 22, 2011

The Nuclear Regulatory Commission issued the Vermont Yankee nuclear power plant a 20-year license extension today, but the plant must still get state legislative approval to continue operating after its license expires next year.

The NRC had instructed its staff to issue the renewal the day before the Japanese earthquake and tsunami but then placed a hold on the license because agency staff were too busy aiding Japan. Opponents of the Vernon reactor near the Massachusetts border hoped the pause would translate into a deeper review of the plant, which has the same design as the crippled Fukushima Daiichi nuclear facility in Japan that has released radioactive material.

"Today's action comes after five years of careful and extensive review and confirms that Vermont Yankee is a safe, reliable source of electricity and capable of operating for another 20 years," said Vermont Yankee spokesman Larry Smith in a statement.

NRC officials said today its staff had completed an in-depth review since Vermont Yankee first filed for an extension in 2006, including an environmental assessment in 2007 and safety evaluation in 2008. The independent Advisory Committee on Reactor Safeguards also reviewed the proposal.

Vermont is the only state in the country that requires the Entergy-owned plant to get legislative approval for an extension. Last year, the state Senate voted 26-4 to close the plant when its license expires next year. Entergy has declined to discuss its plans, saying it is a "legal matter." On Sunday, a vigil was held outside the plant to show solidarity with Japan but also to protest nuclear power. Police said about 250 people attended but organizers say there were twice that many.

Vermont government Peter Shumlin called the NRC's license issue "puzzling".

"Fortunately, Vermont has taken steps to close down the aging Yankee plant, and I have urged other states with older nuclear facilities to follow our example and take control of the lifespan of their plants," said Shumlin.

Yesterday, Massachusetts Attorney General Martha Coakley called on the NRC to place more scrutiny on spent fuel pools at Vermont Yankee and the Plymouth-based Pilgrim nuclear power plants because of the growing number of spent rods on site from the reactors near 40-year operation.

Entergy's Vermont Nuclear Plant Gets NRC Extension (WSJ)

By Naureen S. Malik

Wall Street Journal, March 22, 2011

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

NRC Grants Entergy 20-year Renewal For Vermont Yankee Nuclear Power Plant (NOTP)

By Jonathan Tilove, The Times-Picayune

New Orleans Times-Picayune, March 22, 2011

WASHINGTON -- The Nuclear Regulatory Commission on Monday renewed Entergy's license to operate the Vermont Yankee nuclear power plant for another 20 years.

But the future of the plant, which began commercial operation in 1972, remains very much in doubt

Vermont's new governor, Peter Shumlin, was elected last fall on a pledge to shut down the plant when its current license expires next year.

The Vermont Legislature and public opinion in the home state of Ben and Jerry's seem equally ill-disposed toward keeping the plant operating. And, most significantly, Vermont is the only state in the union where the Legislature has veto power over extending the plant's life.

And then, of course, there is the earthquake and tsunami in Japan and the crisis at the Fukushima Daiichi plant that is now the center of the most serious nuclear accident since Chernobyl, and which, like Vermont Yankee, relies on GE boiling-water reactors with Mark 1 containment system.

"It is hard to understand how the NRC could move forward with a license extension for Vermont Yankee at exactly the same time as a nuclear reactor of similar design is in partial meltdown in Japan," the Vermont congressional delegation said in a joint statement. "We believe that Entergy should respect and abide by Vermont's laws and the (memorandum of understanding) signed with the state in 2002, which require approval by the Vermont Legislature, and then the Vermont Public Service Board, for the plant to continue to operate beyond 2012."

"In light of the on-going crisis at the 40-year-old Fukushima Daiichi nuclear facility in Japan that has prompted other states and nations to review their nuclear power issues, today's decision by the NRC to issue an extension of Vermont Yankee's license is puzzling," said Shumlin. "Fortunately, Vermont has taken steps to close down the aging Yankee plant, and I have urged other states with older nuclear facilities to follow our example and take control of the lifespan of their plants."

Entergy spokesman Michael Burns said, "Entergy is pleased that the NRC issued the extension of the operating license for Vermont Yankee through March 21, 2032, as announced on March 10. Today's action comes after five years of careful and extensive review and confirms that Vermont Yankee is a safe, reliable source of electricity and capable of operating for another 20 years."

But Shumlin said that the lessons for America from the other end of the world are clear.

"We have 104 aging nuclear reactors in America and we're suffering from a policy of irrational exuberance that we can continue to run them all 20 or 30 years beyond their engineered life," said Shumlin. "That's a recipe for disaster. It's just a question of when. Japan should serve as a sober reminder of our irrational exuberance."

Shumlin said Vermont Yankee, located along the Connecticut River near the Massachusetts line, was of special concern because of its ownership and management, which he said were guilty of a series of "misrepresentations and mishaps and leaks," that had squandered the good will Vermonters had for the plant's builders and original owners - a consortium of Vermont and New England utilities that sold Vermont Yankee to Entergy in 2002.

"I'm not opposed to nuclear power," said Shumlin. "I was a big supporter of the plant, it was in my Senate district, it was a big employer and the owners invested in maintenance of the plant and told the truth."

But now, he said, "we kind of feel we have an aging, leaking nuclear power plant run by a company we can't trust and it's prudent to shut it once its license expires in 2012."

Entergy takes a very different view of Vermont Yankee's viability.

"The case for the continued operation of Vermont Yankee is compelling," said Entergy's Burns. "The plant provides safe, clean, and reliable power to Vermont businesses and homes. The plant is a top industry performer across a broad range of operational standards. The economic benefits to the state of Vermont from Vermont Yankee's operation are substantial. The plant is key to the reliability of the electric grid in New England. We are hopeful that these facts will be taken into account as we seek a constructive resolution of our issues with the state of Vermont."

Vermont is the only state in the country that prohibits its Public Service Board from issuing a certificate to permit a plant to continue operating beyond its scheduled license without an affirmative vote of its Legislature.. It won't likely happen. The Senate, under the leadership of Shumlin when he was Senate President, has already voted 26 to 4 against allowing Vermont Yankee to continue operating when its license expires next March.

The day before the Japan earthquake, the NRC indicated it planned to OK renewal, but the actual issuance was delayed until Monday as the commission staff turned its attention to events in Japan.

Shumlin said the NRC has been clear that, despite its plans to issue a new license, "Vermont has the right to determine its own destiny, and the NRC has no intention of standing in our way."

He said Entergy in the past agreed to the state's veto power and he does not think it would have any legal leg to stand on if it sought to fight it in court.

Asked if he was worried about "freezing in the dark," if Vermont Yankee shuts down, Shumlin said there is plenty of available power in the New England grid and "we will certainly shine bright lights without Entergy Louisiana."

NRC Officially Issues 20-Year License Renewal To Vermont Yankee (VTPR)

By John Dillon

Vermont Public Radio, March 22, 2011

(Host) Despite opposition from Vermont's congressional delegation, the Nuclear Regulatory Commission has officially issued a new 20 year operating license to Vermont Yankee.

NRC spokesman Neal Sheehan says the application by Entergy Nuclear was thoroughly reviewed.

(Sheehan) "This application has been put under the microscope for more than five years. So we are comfortable at this point issuing the renewed license. And we will now go about the business of ensuring that Entergy lives up to all the commitments it has agreed to under this license extension."

(Host) The NRC voted more than a week ago in favor of a new license for the plant in Vernon.

But the commission's staff delayed the license because of the nuclear crisis that hit Japan following the devastating earthquake and tsunami.

Yankee's reactor shares the same design as the crippled nuclear units in Japan. And many critics urged the NRC to reconsider its decision on Yankee in light of the Japanese catastrophe.

Bob Stannard is a lobbyist with Citizens Action Network, which wants Yankee shut down.

Stannard says the NRC should have followed the lead of Germany, which ordered seven nuclear plants off line while the government reviews safety issues.

(Stannard) "It's unimaginable to think that the NRC would declare this plant safe when this plant houses 640 tons of spent fuel in an unprotected fuel pool with no containment vessel; In Japan, the plant that's in the worst shape has only 80 tons."

(Host) Yankee spokesman Larry Smith says the fuel is stored safely. He says Entergy is pleased by the NRC decision.

(Smith) "And today's action comes after five years of extensive and careful review and confirms that Vermont Yankee is a safe and reliable source of electricity and is capable of operating for another 20 years."

(Host) Yankee's future, however, is still not clear.

Vermont is the only state in the country that allows its Legislature to have a say in nuclear plant operation. Entergy has so far failed to win approval in the Statehouse. And lawmakers say they haven't been persuaded to change course and vote in favor of Yankee.

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My Turn: Support Yankee's Scheduled Closure (BURFP)

By John Connell

Burlington (VT) Free Press, March 22, 2011

Many people may believe that Entergy's bid for the continued operation of Vermont Yankee died after the resounding defeat in the state Senate last year. However, it is clear that Entergy, the owner of the Vermont Yankee nuclear power plant, does not share this certainty.

Entergy's out-of-state executives are spending boatloads of money on lobbyists in the Vermont Statehouse. They are following up their television advertisements and full-page newspaper ads with a push for a new vote in our Legislature.

I have no idea what stories these lobbyists are spinning for those in the Legislature, but from what I've seen in this newspaper and others, it is apparent that many of their tactics involve fear – that the transmission lines will melt into a gloppy mess, that every business in our state will pack up and move to South Carolina, that our state will enter into a death spiral of unemployment. I also imagine that the well-paid Entergy entourage is continuing to ask the Legislature to pretend that last year's decisive vote was meaningless.

I am certain of one thing: nothing has improved at the plant since the 26-4 vote in the Senate in February 2010. If anything, we have far more information about how poorly the plant is aging. The Fairewinds report, commissioned by the state Legislature, confirms a pattern of deferred and neglected maintenance, a lack of oversight, and the deterioration of key components.

The drumbeat of announcements about radioactive leaks into the groundwater at ever deeper levels and ever wider distribution gives those of us following the Entergy chronicles ever more doubt about the reliability and integrity of the company and the aging reactor. The newest leak, announced in January, is possibly from a completely new and different source than the many other leaks of tritium and other radioactive waste.

The February 2010 Senate vote was the right vote for Vermont. Our elected representatives were speaking for the thousands of citizens who contacted them with one clear message – do the responsible thing. Retire the plant, as scheduled, in March 2012.

Over the past three years dozens of towns have approved resolutions to support retirement of the plant in town meetings across the state. Candidates in the region around Vermont Yankee who openly and strongly support a timely retirement of the plant have repeatedly been elected to office. Vermonters elected a governor in 2010 who campaigned on this issue, and feels strongly that Yankee's time is up.

In town meeting surveys, in independent polling, and in conversations with Vermonters, the result has been the same – the majority of state residents feel that Vermont Yankee is not reliable, safe or the energy source we want for our future. Vermont Yankee is scheduled to retire in less than 14 months. Entergy is using this small window to aggressively lobby legislators instead of planning for the safe clean-up of the reactor site.

Now may be one of the last opportunities for people who want to ensure that this plant really retires in 2012 to be heard. It is again time for citizens to speak the truth about this old nuclear plant.

Contact your legislators. Thank those who voted to retire the plant last year, and express your support for Yankee's planned retirement in March 2012.

John Connell lives in Underhill Center.

Can Vermont Learn From Maine Yankee's Closing? (WCAXTV)

By Kristin Carlson, WCAX News

WCAX-TV Burlington, VT, March 21, 2011

Five hours from home, Marge Kilkelly came to Montpelier from Maine with a message about the impacts of closing a nuclear power plant.

"The whole fabric of the community was impacted by this change. It was very sad and mournful," said Kilkelly, of the Citizens Advisory Panel decommissioning Maine Yankee.

The former Maine senator talked to Vermont senators as Vermont Yankee Nuclear is set to close in a year and lawmakers want to learn about the economic impacts.

"Windham County is going to face similar problems to those in Wiscasset, Maine," said Sen. Peter Galbraith, D-Windham County.

Four years ago, WCAX News traveled up the coast to see Wiscasset and the old nuclear site. Maine officials say not much has changed in those 4 years. Maine Yankee used to provide 90 percent of the town's tax base.

"Basically it's the economics of the town," resident David Nichols told us then.

Current Wiscasset Select Board member Bob Blagden talked to lawmakers by phone, saying the town lost its tax base, had to cut its police force and raise taxes on residents, even as people moved out.

"Most anyone who was of working age and needed to keep working moved because there was not a lot of opportunities in their fields," Blagden said.

Entergy is the company which decommissioned the Maine Yankee plant and owns Vermont Yankee. Maine Yankee decided to close its plant, rather than spend hundreds of millions of dollars in upgrades. The closure was sudden, giving Wiscasset officials little time to prepare... a lesson they hope Vermonters learn from.

"The planning is crucial because with any institution there will come a time when it is not there," Kilkelly said.

"We've had a long and contentious debate about whether it should close or not and that has diverted from thinking about what should happen when it closes... and that's the conversation we need to have," Galbraith said.

Galbraith still supports closing the plant, saying it's old and he worries about safety following events in Japan. Yankee employs about 600 people and Galbraith is among a growing group of lawmakers pushing for state aid to help ease the transition. But some, like Republican State Senator Vince Illuzzi, are starting to reconsider their vote last year, which denied a 20-year license extension for Vermont Yankee.

"If the question is presented again I am going to give serious thought to allowing the plant to be relicensed at least for some period, so we can at least transition to a post Vermont Yankee economy in Windham," said Illuzzi, R-Essex/Orleans Counties.

Senator Illuzzi says that time period should be short -- about 5 years -- and be an agreement that's made between the state and federal regulators. But one person not reconsidering -- Gov. Peter Shumlin. The governor is firm that Yankee was set to operate for 40 years, it has and he says it should be shut down on schedule particularly given recent problems at the plant like tritium leaks and misstatements from company officials.

As for power prices in Maine, when Maine Yankee closed 14 years ago other power sources were cheap and prices did not go up much. But in the end, Maine gets about one-quarter of its power from nuclear; it now just buys it out-of-state.

Vt. House Minority Leader Voices Concern Over Yankee Closure (WCAX)

By WCAX News

WCAX-TV Burlington, VT, March 22, 2011

Burlington, Vermont -- March 21, 2011

Vermont Yankee is scheduled to be shut down in exactly one year, but what will come next?

The Vermont Senate voted in 2010 to close the nuclear plant by March 21 of 2012. Proponents point to aging infrastructure and recent tritium leaks as reasons the plant should close. However some lawmakers say they're worried about that deadline, arguing the state has done little to prepare for life without Vermont Yankee.

"I don't know that we've done anything at this point," House Minority Leader Don Turner, R-Milton, told Channel 3. "I don't think Vermonters understand the full financial impact of that facility. We're starting to see it this week. We'll be talking about an energy bill that came out of the House Energy Committee late last week that has a 55-cent increase in rates for all utility users, so that's just the start I think."

The House is also scheduled to begin debate this week on Gov. Peter Shumlin's health care reform plan.

Pilgrim Nuclear Plant Wants To Cut Training Funds (TAUGAZ)

By Vicki-Ann Downing

Taunton (MA) Gazette, March 21, 2011

Four times a year, the Taunton Emergency Management Agency trains about 200 volunteers how to handle people fleeing a potential disaster at the Pilgrim nuclear power plant in Plymouth.

Volunteers learn how to run equipment to check people for radioactive contamination, direct them to showers, dispose of their clothing, get them into white paper suits and give them potassium iodide – scenes being played out for real every day with the failure of the Fukushima Dai-ichi plant in Japan.

The cost of each training session can run up to \$5,000, which includes the \$15 hourly rate for volunteers and the overtime earned by police officers, said Rick Ferreira, director of the Taunton agency.

Until now, the bill has been footed by Entergy Corp., Pilgrim's parent company, with payments directly to the volunteers.

But the three communities that would act as "reception centers" for people fleeing a disaster in Plymouth – Taunton, Bridgewater and Braintree – complain that Entergy wants to reduce the amounts they receive under their contracts and have them use those same funds to pay for volunteer training.

"This isn't an issue that just came up," Ferreira said last week. "This has been going on in discussions for a year now. They are telling us they're going to cut our money back, and we're going to have to pay for the training out of it as well."

David Tarantino, a spokesman for Entergy, said the company is in the process of negotiating new contracts with the three host communities and with the five towns located within 10 miles of the plant – Plymouth, Carver, Duxbury, Kingston and Marshfield.

Tarantino would not disclose how much the communities now receive from Entergy, a private company.

"We want to be fair. We want to pay the towns what they need," said Tarantino. "But we don't want to pay for things that are not our responsibility."

Asked what kind of items Entergy would not be willing to pay for, Tarantino said, "We have done some audits. We're willing to pay for what is required. We are negotiating. It's never appropriate to negotiate contracts in the (news)paper."

Tarantino said complaints last week from the communities might be a case of "posturing in negotiations."

Ferreira said that in 2000, TEMA received \$114,000 from Entergy to be used toward salaries for himself and an assistant. The amount is now \$108,000, Ferreira said, and Entergy proposes a further cut to \$80,000, with training costs to be taken from that amount.

Ferreira said Entergy is trying to alter agreements that have been in place for 23 years.

Training "is in no way a small effort," said Ferreira. "Without that, there would be no protection and no public safety in a nuclear event."

Bridgewater Town Manager Troy Clarkson said Bridgewater has lost 40 percent of its police force due to budget cuts and needs all the money for training it can get from Entergy.

As "reception centers," Taunton, Bridgewater and Braintree would take in any residents living within 10 miles of the power plant in the event of an evacuation.

Tarantino said about 100,000 people live within 10 miles of Pilgrim. People would be advised to evacuate by the state Department of Public Health, Tarantino said, and it would be unlikely that an evacuation would be advised for everyone within 10 miles.

The Pilgrim plant, which opened in 1972, has been owned by Entergy since 1999. Its application to the Nuclear Regulatory Commission for a 20-year renewal of its license was filed six years ago but has been stalled in hearings. The license expires in 2012.

Vicki-Ann Downing can be reached at vdowning@enterpriseneews.com.

New Designs For Nuclear Power Plants Seek To Generate Greater Trust (KCS)

By Steve Everly, Mark Davis

Kansas City Star, March 20, 2011

When President Dwight Eisenhower flipped the switch on the country's first commercial nuclear-fired plant in 1958, he turned on a new source of power that now provides a fifth of our electricity.

In the decades since, nuclear plants around the world, including the two in Missouri and Kansas, were built bigger and better. But their design kept the same potential flaw as that first plant.

They relied on electric pumps to bathe hot fuel rods with cooling water to prevent a dangerous meltdown. And if a power outage knocked out those pumps, backup generators would kick in to get them running again.

If that cooling system failed, watch out.

That's what happened at the Fukushima Dai-ichi Nuclear Power Station in Japan when a huge earthquake knocked out the plant's power and a subsequent tsunami crippled the backup diesel generators.

Is there a better way to build a nuclear plant? Nuclear engineers say there is.

In fact, in a couple of decades commercial nuclear reactors may become so advanced they could be “walk-aways,” meaning no one would have to monitor the plants for meltdowns.

But even as debate rages about the future of nuclear energy, a new generation of inherently safer nuclear plants is coming on line now.

The main feature of the new generation is a so-called passive backup cooling system that would keep reactors safe if electricity were cut off. These systems rely on gravity, temperature-sensitive valves and natural convection currents to move water through a reactor.

Although not without its critics, the improved design may have been able to prevent the disaster that beset the Fukushima Dai-ichi plant.

“There’s a better design,” said Gary Mueller, an associate professor of nuclear engineering at Missouri University of Science and Technology. “If they had a passive system, there wouldn’t have been the problems.”

Meanwhile, governments around the globe have paused nuclear power programs to re-evaluate where they stand and whether to push forward more quickly with new designs.

Lessons from disaster

Japan’s unfolding catastrophe comes at a crucial time for the US nuclear industry, which produces more electricity than any other country, even though a new reactor hasn’t gone online since 1996.

The first nuclear plant that Eisenhower inaugurated in Pennsylvania 53 years ago was a prototype, part of a first generation of small plant designs intended to prove nuclear energy could deliver power commercially.

Those few Generation I plants used heat from controlled nuclear reactions to produce steam that drove turbines that made electricity. And they pumped water to keep the reactor cool and safe.

It worked, and dozens of bigger versions followed, using similar power-generation methods and cooling-system designs. But as each plant was built, its design was tweaked by emerging regulations, modified to meet newly discovered operating problems and tailored for the utility that ordered the plant.

The 1979 accident at Three Mile Island — a partial meltdown released some radioactive gas from the reactor in Pennsylvania — changed everything.

It focused regulatory efforts on safety and triggered a wave of retrofitting for older plants and changes in new plant designs. It also opened up the industry — designers and operators began sharing information to run plants more safely and effectively.

The original plants, each of them unique, have been homogenized so that they operate and deploy largely the same safety features.

Three Mile Island gave us our current collection of 104 operating plants that use what the industry considers Generation II designs.

But after boom times that began in the 1970s, the nuclear industry stagnated and is now being slammed by the high cost of the reactors and the low cost of power plants fueled by natural gas. That has made building a nuclear plant uneconomical, even with substantial government subsidies.

Today only one nuclear plant is being built in the country by the Tennessee Valley Authority. Four to six more might be built over the next decade.

China, which heavily subsidizes its nuclear plants, is building 27.

That means the United States can’t avoid the nuclear question even if growth in nuclear energy remains sluggish here. We’ll still be vulnerable to nuclear accidents elsewhere.

Besides, the country is now counting more on nuclear energy to curb greenhouse gases from fossil fuels that contribute to global warming.

President Barack Obama told the Nuclear Regulatory Commission on Thursday to conduct a “comprehensive review” of the safety of all 104 US nuclear plants but made clear his support of nuclear power.

“Nuclear energy is an important part of our own energy future,” the president said.

A spokesman for Missouri Gov. Jay Nixon, who has backed efforts to get site approval for a second nuclear reactor at AmerenUE’s nuclear plant southeast of Fulton, Mo., said the permit process would allow plenty of time to examine any risks.

“Missouri needs safe, reliable and affordable energy to meet our future needs,” said the spokesman, Sam Murphey. “Construction of a state-of-the-art nuclear plant in Callaway County would provide those benefits for decades to come, in addition to providing thousands of jobs.”

Next generation

Efforts to address some of the Generation II design issues began decades ago.

Larry Drbal, chief nuclear engineer for Black & Veatch, an engineering firm in Overland Park, said that in the 1980s utilities began pushing for design changes in new plants.

Current Generation II reactors meet the Nuclear Regulatory Commission's requirement that the chances of a release of radioactivity are no higher than one in a million.

The new breed of Generation III nuclear plants aim to improve on those odds to one in 10 million with more redundant safety systems and the use of passive cooling systems.

Those new designs still operate normally with electric pumps, but the passive systems take over should the normal systems fail.

Some critics have questioned whether these features will work as promised, but Drbal said those familiar with passive cooling systems were confident.

"I think it is a way we need to go," Drbal said.

Black & Veatch is now working on two advanced reactors in Taiwan and is supporting design certification for the new passive-safety nuclear plant from General Electric.

A key advantage of passive systems is that they don't require plant operators to take any action.

"That's the whole point, because we tend to screw things up," said Dan Ingersoll, a senior program manager for Oak Ridge National Laboratory's reactor and nuclear systems division. "That really is the distinguishing feature between Generations II and III."

It's a design philosophy that will give operators more time to react to problems, he added.

For example, designs for Westinghouse's Generation III AP1000 plant place a vast reservoir of water above the reactor. Should the normal system fail, the water begins to fall, cooling the reactor.

There's enough water to cool the reactor for 72 hours, Ingersoll said. That gives plant operators three days to fix the active pump systems or at least refill the reservoir for another 72 hours of safety.

The Generation III rollout also relies on standardized designs so that an AP1000 built here is just like an AP1000 built there. Designs are simpler, leaving fewer things to break or go wrong, and build in more redundancies.

Ingersoll's example: A rod in a passive system is supposed to fall to release water but instead gets stuck. To deal with that, a plant operator can open a manual valve.

The Westinghouse AP1000 has become a popular model for US utilities that would like to build nuclear plants someday and have filed applications with the Nuclear Regulatory Commission.

China plans to build many of them and has substituted AP1000 designs for some of the older Generation II plants that were scheduled.

Other companies offering the newest reactor designs include General Electric and Areva.

Areva is offering a Generation III design that China, Finland and France are each building. It's not yet ready in the United States, where final approvals aren't complete.

Areva's design includes four "trains," which are self-contained safety systems, including backup generators and controls housed in separate buildings that can spring into action if there is a problem.

"So long as one works, you're good," said Finis Southworth, chief technology officer for Areva Inc., the US arm of Paris-based Areva Group.

The plant also offers a passive cooling feature — a second containment vessel around the one that houses the reactor core. Millions of gallons of water are inside the second container. That's enough to dissipate the heat generated from a damaged core.

"Even if you damage the core, it does not damage the barrier of the containment, and it's passive," Southworth said.

Helium and thorium

The rethinking behind Generation III plants pales in comparison to what's under way with Generation IV plants.

Designers have embraced several technologies to make plants that are safer and more economical, reduce waste and prevent formation of material for nuclear weapons.

Some would run at low temperatures and others at high temperatures but still operate more safely.

They're exotic as well. Instead of using water, some cool the nuclear reactions with helium, molten lead or similarly hot fluid salts.

India's next-generation nuclear program is about replacing uranium with thorium as the nuclear fuel. Thorium produces less waste and less weapons-grade material.

These designs are vastly different, because Generation IV expects nuclear plants to do more than create steam to run a turbine.

A higher-temperature plant can use helium to drive gas turbines that are more efficient than the steam ones. High-temperature reactors can be used to turn coal into liquid fuels for home heating or transportation. Generation IV plants also will be called on to produce hydrogen.

Safety, however, remains a driving force behind the advancing designs.

The United States is leading research on designs that get rid of fuel rods and encase nuclear fuel particles inside ceramic coatings and graphite cylinders or spheres to make "pebbles" roughly the size of billiard balls.

"Envision a large gumball machine," said Hans Gougar, deputy technology director of the Very High Temperature Reactor program at the Idaho National Laboratory.

A small reactor in Germany used blowers to circulate helium among the pebbles and used the heated helium to generate electricity. It didn't need a cooling system.

Its design was such that operators could shut down the plant by turning off the blowers.

"It was one of the off switches" operators could use, Gougar said.

The idea is "walk-away safe" plants that don't need active or passive cooling systems to operate or be safe.

South Africa was developing a pebble-bed reactor program since 1999. But after pumping nearly \$1 billion into it over 11 years, the government closed its checkbook a little more than a year ago. And the program hasn't found customers.

Whatever Generation IV designs are adopted, costs will remain a big problem.

Ingersoll, from Oak Ridge, said just building a Generation III design can take 10 years and \$1 billion.

"And that's with familiar technology," he said. "Now you talk about exotic technology ... you're talking about probably double the time and triple the cost."

Moreover, electricity supplied by a nuclear reactor must compete with electricity from power plants fueled by now-cheap and plentiful natural gas.

And that means a nuclear plant must operate for many decades to sell enough kilowatts at market prices to make the upfront investment financially rewarding.

Gougar said the US-backed research into very-high temperature reactors had been scheduled to demonstrate a commercial reactor by 2021. But money hasn't come from Congress on schedule, and now it won't happen before 2030.

"It really comes down to money," Gougar said.

Editorial: Keep Nuclear Part Of Energy Future (MHTR)

Manitowoc (WI) Herald Times Reporter, March 22, 2011

Nuclear safety is on everyone's mind as events play out in Japan, where nuclear plants were damaged or compromised following a devastating earthquake and ensuing tsunami.

We don't know the full extent of the damage there, or its impact on human health or the environment. That will become more clear in the days and weeks ahead.

Manitowoc County has two nuclear reactors -- at Point Beach -- and another located in neighboring Kewaunee County. Combined, they provide one-fifth of all the electricity used in Wisconsin.

The inevitable question arises: Could what happened in Japan happen here?

The answer is yes. Natural disasters -- and their severity -- defy even the best the science of prediction has to offer. This was, after all, the largest earthquake ever to strike Japan, and there was no advance warning.

Don't pack up the kids and your belongings just yet, though.

Those in the nuclear industry said reassuring things following the Japan disaster. Viktoria Mitlyng of the US Nuclear Regulatory Commission said the Kewaunee and Point Beach nuclear plants were made to survive the worst natural disasters on record.

Sara Cassidy of the Point Beach plant said the facility's design and maintenance are based on the worst-case seismic scenario for the plant's location.

And Mark Kanz of the Kewaunee nuclear plant said its owner, Dominion Resources, would review all of its safety systems.

They all are comforting, albeit predictable, statements.

In this case, however, we put more stock in the past than in what might happen in a future impossible to predict. The Point Beach and Kewaunee facilities have, for the most part, had clean safety records since going online in the 1970s.

There have been occasional glitches, but they were thoroughly examined by the NRC and corrective measures were taken. None of the instances rose to the level of seriously compromising public safety.

We can be thankful that current and previous management of the local nuclear facilities has been, if not always stellar, at least proficient to the point of keeping the plants operating safely and efficiently.

That says a lot in an industry coming under increasing fire from those who believe the US nuclear footprint should be much smaller, if not eliminated altogether.

President Obama has asked the NRC to conduct a "comprehensive review" of the safety of all 104 US nuclear plants following the disaster in Japan. It's another in a series of predictable responses.

Ongoing review of nuclear safety is, after all, what the NRC does. We hope that those reviews are, indeed, comprehensive. New data from the Japan disaster can prove helpful.

More to the point in the president's recent remarks is this: "Nuclear energy is an important part of our own energy future."

That bodes well for an industry in the midst of battles over plant decommissioning, new and costly rules, and environmental regulations.

We hope that nuclear power, with ongoing and thorough oversight, will continue to be part of the nation's energy landscape for many years to come.

Could It Happen Here? (MORRISDH)

By Jo Ann Hustis

Morris (IL) Daily Herald, March 22, 2011

Nuclear disasters like the potential one unfolding in Japan can be a major concern in areas such as Grundy County, where residents have three generating stations as neighbors.

Especially when the General Electric-designed nuclear reactors at Fukushima Dai-ichi are twins in design to the Mark reactor at Dresden Generating Station at Morris.

Dresden has experienced earthquakes in the past, although not to the magnitude the Fukushima reactors were met with last Friday, when the earthquake there was followed by a tsunami.

"We've had earthquakes before, but we've found no damage to our equipment," Dresden site communications coordinator Bob Osgood noted. "We're operating safely, our neighbors are safe, and these plants are equipped with numerous and redundant safety systems."

Exelon Chairman John Rowe echoed those statements in a press release.

Dresden owner Exelon Nuclear is very closely monitoring the Japanese situation as it continues to unfold. Although there still is much not known about the crisis, the damage so far appears primarily related to the tsunami instead of the earthquake.

"All our plants are designed to American seismic and flood standards," Osgood said. "The rivers flood, and we are prepared for that. The plants are safe, especially given the seismic patterns in the Midwest and absence of tsunami-like events."

Mian Liu is professor of geological sciences at the University of Missouri. He says the Japanese earthquake, which measured 9.0 on the Richter Scale, is entirely different than the earthquakes that have occurred along the state's New Madrid Fault, which extends south from Cairo, Ill.

"Earthquake histories in countries like China, where excellent historic records were kept, indicate that large earthquakes in mid-continent tend to migrate among faults," he said in a news release.

Even the best science and technology cannot predict where and when the next earthquake will occur, he noted, saying that Japan is a world leader in earthquake research with advanced monitoring networks. The Friday earthquake – largest in Japan's recorded history – occurred on the country's northern coast. This is although their earthquake hazard map indicates the southern coast is in the most danger.

"This just shows how much uncertainty goes into our assessment of earthquake hazard," Liu said.

Most areas are potentially susceptible to earthquakes, Region 3 Nuclear Regulatory Commission spokesman Viktoria Mytling of Lisle noted.

"Nuclear plants are built to withstand earthquakes and other natural phenomenon to the highest known level for the area, plus an extra margin," she said Tuesday.

"The plants are built to those standards. The (NRC) periodically re-evaluates this information, and if new information comes to light on seismology, it is reviewed and factored into making sure the plant can operate safely."

Region 3 has had a lot of questions from the public since the Japanese crisis. Many of the questions center around Japan. Others question why people should feel nuclear power plants are safe.

The NRC has calculated the odds of an earthquake causing catastrophic failure to a nuclear plant in the United States.

In information released Wednesday, the NRC noted chances are 1 in 74,716 annually that the core of a typical nuclear reactor in the US could be damaged by an earthquake, exposing the public to radiation. By comparison, chances of winning the \$10,000 Powerball multistate lottery are 1 in 723,145.

There are 104 nuclear power reactors in the United States. The NRC has ranked its estimate of annual risk of an earthquake damaging the core of each reactor and releasing radiation.

Exelon's Dresden Station is 42nd of the 104 places in rank, with the estimated chances for damage to Units 2 and 3 at 1 in 52,632.

Braidwood Generating Station at Braceville is ranked 71st out of 104 places. Damage chances at Units 1 and 2 are estimated at 1 in 136,986.

La Salle Generating Station in Brookfield Township, Marseilles, is in 97th place. The estimate for Units 1 and 2 is 1 in 357,143 chances.

Byron Station at Byron, Ill., is in 81st place, with damage estimates for Units 1 and 2 at 1 in 172,414 chances.

Quad Cities Station at Cordova is in 31st place. The estimates for Units 1 and 2 are 1 in 37,307 chances.

There are also questions whether other parts of the globe will experience atmospheric contamination from the Fukushima Dai-ichi crisis. A couple factors are involved with radiation, Mytling said. One is the amount of radiation being released. The other is the further away a location is from the source of the contamination, the more diluted the radiation becomes.

"Based on the information we have today, there is no indication that any harmful radiation will have impact on the United States, including Hawaii and Alaska," she said.

Paul Gunter is a technical expertise spokesman with Beyond Nuclear at Takoma Park, Md. A non-governmental agency, BN's goal is to educate the public on nuclear power and nuclear weapons, and what Gunter says is the need to abandon both to safeguard the future. The agency is an advocate for an energy future that is sustainable, benign, and democratic.

Gunter believes Dresden's reactors should be taken off line because of their proximity to the area of the New Madrid fault. Also, because of what he said is the bad design of the containment system acknowledged by the former Atomic Energy Commission in the 1970s.

"These are now old plants and vulnerable to natural catastrophe, human error and mechanical failure," Gunter added. "All these are trigger points. The ignition could come in any number of ways, like natural disaster, act of war, and mechanical failure."

This is why Germany is increasing its inspection of the country's older generating stations.

"We're calling on the NRC to immediately shut down the Mark 1 reactors until the Japanese disaster plays out, and we can have a calm look at the fact the Mark 1 is a bad design," Gunter said.

The NRC has not yet responded to his request, he noted.

"I go to bed at night now, thinking about all 23 Mark 1 units in operation in the United States in the context of what's going on in Japan. Dresden Unit 2 came on line in 1970, so it's a year older than the Japanese units. It's bad design, even older than the Japanese design, and the containment is as likely to fail if it's ever challenged by an accident," he said.

"There's many ways an accident can be initiated. We need to always worry about earthquakes and human and mechanical failures. Any of these could be the match that lights the nuclear fuel."

The only relevant protection to radiation is prevention, Gunter said. Radiation will dissipate, he pointed out. However, he called attention to the tremendous amounts of radiation in the six units at the Fukushima plant, and his concern about the impacts of the Japanese crisis on the United States should the plumes reach the Aleutian Islands, Alaska, and the west coast of Canada and the US.

"We're hoping and pulling for those folks to quell the fires of hell in Japan," he said. "I'm in humble awe of all those suffering in Japan now, and how the nuclear issues has compounded their suffering megafold, as if the earthquake and tsunami were not enough."

Calif. Senators Call On Utilities To Delay Nuclear Plant Relicensing For New Seismic Studies (AP)

Associated Press, March 22, 2011

State lawmakers called on California utilities Monday to delay efforts to relicense nuclear power plants until the companies complete detailed seismic maps to get a true picture of the risks posed by earthquakes and tsunamis.

State senators raised sharp questions about whether California's nuclear plants can withstand a major natural disaster such as the one on March 11 that has left Japan scrambling to control radiation coming from some of its reactors.

Lawmakers also questioned whether the utilities have been dragging their feet on conducting three-dimensional seismic studies called for in a 2008 state report to assess the risks posed by offshore faults.

Pacific Gas and Electric Co. has applied to renew its license to operate the two reactors at Diablo Canyon Power Plant near San Luis Obispo, which expire in 2024 and 2025.

"I would ask sincerely that PG&E suspend or withdraw that application" until the additional seismic mapping is completed, said Sen. Sam Blakeslee, R-San Luis Obispo, a geophysicist who has been a frequent critic of Diablo Canyon. He said he would pursue legislation to thwart the utility until the mapping is done.

Blakeslee in 2009 introduced a bill that would have required the utility to meet that and other requirements; it won unanimous support in the Legislature but then-Gov. Arnold Schwarzenegger vetoed it.

Lloyd Cluff, a seismic expert for PG&E, said work started in October for shallow mapping and the utility will apply in April for a permit for deep mapping down to 10 kilometers below the surface.

"We're doing it as we speak," Cluff said.

Edison has applied to the Public Utilities Commission for permission to charge ratepayers an estimated \$21.6 million for similar studies at the San Onofre plant north of San Diego along the Southern California coast, said Caroline McAndrews, director of licensing at the plant.

The license for San Onofre expires in 2022 and Edison has not yet applied to renew it.

California gets a total of about 12 percent of its power from the Diablo Canyon and San Onofre nuclear plants.

Outside the hearing room, Daniel Hirsch, a lecturer in nuclear policy at University of California, Santa Cruz, noted California's reactors are in one of the most seismically active areas of the world after Japan. "What's going on in Japan could happen here," he said.

Japan's plants were not designed to handle the ground movement or wave heights they were subjected to this month, said Steve David, director of site services at Diablo Canyon.

Diablo Canyon and San Onofre have been designed to survive much larger forces, utility representatives testified.

"We've gone back this week and verified that (safety) equipment is in place and that the operators have been trained," David said.

The senators are reviewing whether California's nuclear power plants and natural gas pipelines are safe from earthquakes, as Japan's crisis raises uncomfortable comparisons to the nuclear plants on the US West Coast.

"Japan has always been a leader in preparedness," said Sen. Ellen Corbett, a San Leandro Democrat who chairs the Senate Select Committee on Earthquake and Disaster Preparedness, Response and Recovery.

"It's time to revisit the safety of these plants in light of what we have learned from Japan," Corbett said.

The utilities contend the plants have been designed and located to protect them from the most serious natural threats considered possible at the sites.

For example, Diablo Canyon is anchored in bedrock and has safety systems and emergency reservoirs located at 80 feet or more above sea level. San Onofre is protected by a 30-foot seawall.

Corbett noted that seismic experts have estimated there is a 2 percent to 3 percent chance of a major earthquake in California each year, and a 46 percent chance of a quake with a magnitude of 7.5 or greater within the next 30 years.

The White House last week asked the Nuclear Regulatory Commission to conduct a comprehensive review of safety for all 104 US nuclear plants.

The Union of Concerned Scientists has accused the NRC of lax oversight at some nuclear plants that were subjects of special inspections last year.

At the same time, the Obama administration has been seeking billions of dollars in federal guarantees for the nuclear energy industry, and nuclear power has seen a resurgence of interest as concerns grow about greenhouse gases emitted by burning hydrocarbons such as coal and oil.

Concerns about seismic safety have haunted California's two plants for decades as geologists identified new faults near the generators that could produce earthquakes, and safety problems made headlines.

A 2008 NRC report revealed a battery meant to power safety systems at the San Onofre plant, 70 miles southeast of Los Angeles, had not worked for four years.

The Union of Concerned Scientists report last week noted a finding that emergency cooling-water valves failed in 2009 at the Diablo Canyon plant as a result of repairs that were made to another set of valves 18 months earlier.

Questioned about that incident, David said the problem would have prevented control room operators from activating the valves, but that they would have had more than an hour to activate them from a nearby switchbox or manually.

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Senator Asks PG&E To Suspend License Renewal Request For Diablo Canyon Nuclear Plant (Ventura County Star)

Ventura County Star, March 22, 2011

A state senator on Monday accused the operator of the Diablo Canyon nuclear power plant of operating under "a culture of disregard of risk" and asked Pacific Gas & Electric Co. to suspend or withdraw its application for license renewal until the company has completed advanced seismic studies requested by state regulators three years ago.

Sen. Sam Blakeslee, R-San Luis Obispo, a geophysicist whose district includes the site of the nuclear plant, said PG&E has consistently downplayed the risks associated with the discovery of an offshore earthquake fault line in 2008. That "culture of disregard," he said, "has become endemic at PG&E. It's a culture that puts my constituents at risk."

His remarks came during a special Senate committee hearing designed to examine lessons California might learn from this month's earthquake and tsunami in Japan and the subsequent crisis at a nuclear power plant whose reactors were crippled by the shutdown of essential cooling systems needed to prevent a meltdown.

Lawmakers were told that seismic studies at the sites of both California nuclear plants — the other is at San Onofre, in San Diego County — are insufficient to assess risks associated with geologic data that has become available since the plants were built.

James Boyd, vice chairman of the California Energy Commission, testified that "recent studies have found that ground motion near a fault could be stronger and more variable than previously thought, which could be important at Diablo Canyon, since the offshore Hosgri Fault is 4.5 kilometers west of the plant."

The commission recommended in November 2008 that both plants should use three-dimensional seismic mapping to update their seismic research, but Boyd noted that has not yet been done.

Daniel Hirsch, a lecturer in nuclear policy at UC Santa Cruz, said recent problems at Diablo Canyon, including the fact that emergency cooling pumps had been disabled for 18 months before the problem was discovered, show that safety systems are insufficient.

"I don't believe what happened in Japan is something we're immune to here," he said.

Steve David, PG&E's director of site services at Diablo Canyon, said the company has "large margins for safety" at the plant. He noted the elevations of the plant and all of its safety systems, including diesel-powered generators and their fuel tanks, are much higher than is the case at Japan's Fukushima plant.

The plant, 120 miles north of Ventura, has had a troubled history of dealing with unexpected seismic issues. The Hosgri Fault, capable of producing a 7.5 magnitude quake, was discovered a year after its construction permits were issued in 1970, forcing a redesign that caused construction costs to balloon from the \$320 million estimate to more than \$5 billion.

Later, in 1981, PG&E discovered it had built seismic supports based on a reversed blueprint, requiring another \$2.2 billion in retrofits to correct the mistake.

Then, a little more than two years ago, the US Geological Survey discovered another previously unknown offshore fault, the Shoreline Fault, less than a mile from the plant.

PG&E and the federal Nuclear Regulatory Commission determined the plant's design could withstand an earthquake along that fault. However, Boyd of the state Energy Commission, testified the fault's "major characteristics are largely unknown," including the question of whether an earthquake beginning on one of the offshore faults could continue along the other to produce a larger quake than would be anticipated along either one individually.

The plant is licensed through 2024. PG&E submitted an application to the Nuclear Regulatory Commission in November 2009, seeking a 20-year extension.

Under the commission's rules, Boyd testified, seismic activities are considered not relevant and are "not taken into account in relicensing."

He noted, however, that the recent events in Japan led President Barack Obama and Energy Secretary Steven Chu to request in-depth studies of existing US power plants, which will possibly now mean the advanced seismic studies will be required before the license can be extended.

Blakeslee said if PG&E does not agree to suspend its license application he will seek legislation to try to force it to do so.

Given that the current license is good for another 13 years, he said, "There is more than enough time to address this uncertainty."

PG&E Blasted For 'Disregard Of Risk' At Nuclear Plant (BAYCIT)

By Annette Fuentes

Bay Citizen (CA), March 22, 2011

A nuclear power plant on California's central coast was characterized Monday as a disaster-in-waiting during a state Senate hearing that saw Pacific Gas and Electric Company, the plant's operator, blasted for what lawmakers called a culture that disregards risks.

The waterfront Diablo Canyon nuclear power plant in San Luis Obispo County sits a few hundred yards from a fault line that was discovered in 2008. PG&E is seeking to renew the facility's operating permits without having thoroughly studied the likely impacts of an earthquake along that fault.

Under intense questioning during a Senate informational hearing on earthquake preparedness Monday, PG&E's Geosciences Department Director Lloyd Cluff acknowledged that uncertainties about earthquakes near the facility exist, but said, "We don't see a concern about the uncertainty."

That statement, which Lloyd later tried to clarify by saying that the company's risk models account for uncertainties, made some lawmakers livid.

"I just don't find PG&E truly forthcoming on addressing all of these issues," said Sen. Elaine Alquist (D-Santa Clara), who compared the company's reliance upon "assumptions" about seismic safety at the nuclear power plant with its inability to account for the manufacturing design or operating capacities of the majority of its pre-1970 natural gas transmission pipelines.

Daniel Hirsch, a nuclear policy lecturer at the University of California, Santa Cruz, told lawmakers that PG&E had been successfully resisting efforts to thoroughly study the likely impacts of an earthquake on the facility, which is located 180 miles south of San Jose, since the plant was first proposed in the 1960s.

A nuclear accident at the facility could sicken or kill more than 1 million people, Hirsch testified.

The danger would come from damage not only to the plant's reactors, according to Hirsch, but also to storage facilities that are holding more spent nuclear fuel than they were designed to store.

The waste fuel was planned to be shipped by now to a federal storage facility, but no such facility has been built, according to Hirsch.

NRC Sends Inspectors To Ameren's Callaway Plant (SLPD)

By Jeffrey Tomich

St. Louis Post-Dispatch, March 22, 2011

Federal regulators have begun a special inspection at Ameren Missouri's Callaway nuclear plant after indications that a water pump used to help cool a key plant component in the event of an accident may not work properly.

Nuclear Regulatory Commission inspectors began their work today, and will probe circumstances surrounding an oil sample taken on Feb. 8 that suggested the pump may have been inadequately lubricated.

The oil sample in question was discolored and contained particulate indicating the oil level may have been too low to lubricate the pump bearing, according to the commission.

The auxiliary feedwater pump is used to supply water to the plant's steam generators during some accident conditions, the NRC said.

The NRC decided a special inspection was warranted because of a previous event in 2009 involving inadequate lubrication in the same system.

NRC Inspectors Look At Lubrication Concern At Missouri Nuclear Plant (AP)

Associated Press, March 22, 2011

A Nuclear Regulatory Commission inspection team is at Ameren Corp.

's Callaway nuclear plant near Fulton after concerns were raised about lubrication of an auxiliary feedwater pump.

An Ameren spokesman says the inspection is unrelated to heightened concerns at nuclear plants following the damage to the plant in Japan.

The NRC says an oil sample taken Feb. 8 showed the auxiliary pump might have been inadequately lubricated. The pump is used to supply water to steam generators during some accident conditions.

The oil sample indicated that the oil level may have been too low to properly lubricate the pump bearing. If that happens, the pump may not be able to run long enough during an accident scenario.

The NRC says the inspection was begun because a similar finding occurred at Callaway in 2009.

STP Expansion Slowed Down In Wake Of Japanese Disaster (SAEN)

By Hamilton

San Antonio Express-News, March 22, 2011

Nuclear Innovation North America announced Monday that it is slowing down development of two additional nuclear reactors at the South Texas Project to give federal regulators and others time to assess the state of the industry in the wake of Japan's nuclear disaster.

Work on the proposed new plants will now be limited to licensing and securing the US federal loan guarantee upon which the project depends, according to a release from NINA, the nuclear development company owned by NRG Energy and Toshiba Corp.

In conjunction with that announcement, CPS Energy CEO Doyle Beneby said the utility would indefinitely suspend talks to buy power from the proposed reactors.

"NRG and its partners stand squarely behind new nuclear power as the most important component in our transition to a low-carbon economy," said David Crane, chairman of the board of NINA and CEO of NRG.

"However, our best course of action in this immediate period of uncertainty is to minimize project spend, continue with those activities we can control and wait until there is more information upon which we can base our long-term decisions. This is the financially disciplined course of action in uncertain and challenging times."

The move added a degree of finality to CPS' earlier announcement, on March 14, that the parties had agreed to mutually cease talks as the nuclear crisis in Japan first began to unfold.

The Obama administration recently called for a comprehensive safety review of the US nuclear fleet. Any design or regulatory changes stemming from that review could likely affect the proposed new units.

Crane said that since STP and the stricken plants in Fukushima are very different, it wasn't clear whether modifications would be necessary to the existing or planned units.

"However, as we unreservedly support our government's proposed nuclear safety review, the prudent thing for us to do is to await the outcome of that review before committing more of our own or our partners' capital."

Crane said NRG remains committed to an earlier promise it made to shareholders that it would make a final decision about whether to continue investing in the project by the third quarter of this year.

Before the Japanese crisis, the company was hoping to have enough clarity in four areas to make a decision, Crane said: the status of federal loan guarantees from the Department of Energy, the Nuclear Regulatory Commission's licensing process, an agreed-upon price to build the plant and enough customers committed to buying the power.

"And now we need to have a good idea of who the owners will be," he added.

Tokyo Electric Power Co., or Tepco, which owns the crippled Fukushima plants, had been expected to invest in the expansion; given the company's capital needs in the wake of the disaster, that's now unlikely, Crane said.

But the Japanese government's interest in putting up loan guarantees could still be on the table, he said — though he stressed that NRG has not spoken directly to either the Japanese government or Tepco since the earthquake — since those guarantees would support Toshiba.

"Presumably they would be just as motivated to support Toshiba and its exports, which creates jobs," he said.

Beneby said CPS would continue to pursue other options to replace the 851 megawatts the utility will lose when the Deely coal units at Calaveras Lake are retired, likely by 2018, including "clean coal, natural gas and big solar."

The utility recently released a request for proposals to build an additional 50 megawatt solar installation in the area, and Beneby told environmentalists at their regular quarterly meeting earlier this month that he has begun discussions with solar companies about investing in "big, big solar, maybe a couple hundred megawatts."

Terminating discussions with NRG allows CPS to devote more resources in pursuit of those other options, he said.

He also indicated that the utility would not alter either its current 40 percent ownership in the existing two reactors at STP, or its 7.6 percent stake in the proposed expansion.

After many months of relative silence between the former partners, NRG approached CPS earlier this year about buying more of the output from the proposed plants under a long-term, fixed price contract.

CPS Board of Trustees Chairman Derrick Howard said Beneby's decision is the right one.

"Everybody needs to take a pause," he said. "For a lot of reasons, and for a lot of the right reasons."

Beneby said that if talks do start up again between CPS and NRG, they would start from scratch.

The parties had some initial discussion before Japan began battling to keep its reactors from melting down.

South Texas Nuclear-power Plant Expansion Project Put On Hold (SABIZ)

San Antonio (TX) Business Journal, March 22, 2011

Nuclear Innovation North America LLC is scaling back its expansion plans for the South Texas Project until the US Nuclear Regulatory Commission and other stakeholders can effectively assess the impact of the events in Japan.

Nuclear Innovation North America (or NINA) is the company jointly owned by NRG Energy Inc. and Toshiba Corp. that is developing two nuclear reactors at the South Texas Project near Bay City, Texas.

Given the tragedy of the earthquake and tsunami that struck Japan on March 11, NINA officials will limit work on the South Texas Project expansion to securing a license and a federal loan guarantee for the nuclear project.

Tokyo Electric Power Co. employees in Japan are still working to stabilize the reactors at the Fukushima Daiichi nuclear plant. The outcome of those efforts will likely determine the future of nuclear power development throughout the world.

Executives with NRG Energy, Toshiba and CPS Energy are all watching developments in Japan closely.

"Since STP is very differently situated from the stricken nuclear plant in Japan — 10 miles from the Gulf of Mexico, in a non-seismic area with hardened watertight protection around both its backup generation and its spent fuel storage facilities — it is not obvious to us that any modifications are necessary to regulatory requirements applicable to either our existing or planned nuclear facilities," says David Crane, president and CEO of NRG Energy.

Meanwhile, CPS Energy officials on Monday released a statement that San Antonio's municipally owned utility has decided to suspend discussions indefinitely with NRG Energy with respect to buying additional supplies of nuclear power from the South Texas Project.

"As we have indicated for months now, we are currently pursuing an array of other clean affordable supply options. Terminating discussions with NRG allows us to devote more resources in pursuit of the other options," says CPS Energy President and CEO Doyle Beneby. "When the development of STP 3 and 4 moves forward again, our present ownership interest will remain unchanged."

CPS Energy is not ruling out future discussions with NRG, however.

CPS Energy owns a 40 percent interest in South Texas Project and a 7.625 percent minority ownership in two units that have yet to be constructed.

Arizona Capitol Times » Blog Archive » Arizona Nuclear Power Plant Facing Safety Hearing (AP)

Associated Press, March 22, 2011

The Arizona Corporation Commission will hold a public hearing with operators of the nation's largest nuclear power plant to assess safety procedures in the wake of Japan's nuclear catastrophe.

The triple-reactor Palo Verde Nuclear Generating Station is located in Wintersburg, about 50 miles west of downtown Phoenix.

Palo Verde supplies electricity to about 4 million customers in Arizona, New Mexico, Texas and California.

The Nuclear Regulatory Commission also plans to review the safety procedures at Palo Verde and at other US nuclear plants because of the situation in Japan.

Arizona Corporation commissioner Bob Stump suggested the public hearing and it's been agreed to by the other four commissioners although a date for the session hasn't been set.

Stump sent a letter on Thursday to Arizona Public Service Co.'s Chief Nuclear Officer Randy Edington requesting a briefing on the plant the utility company operates on behalf of six other owners.

"The meeting gives us an opportunity to review them in light of the tragedy in Japan," Stump told The Arizona Republic.

Workers in Japan have been struggling to cool down units at a nuclear-power plant 150 miles north of Tokyo that was damaged by last week's earthquake and tsunami. The units are leaking radiation.

"Some Arizonans have expressed concerns about their health and safety in the event of a disaster, given Palo Verde's proximity to locations where so many people live and work," Stump wrote.

Stump's letter outlines a number of questions he has about the plant's operation, including what safety procedures would be implemented if a natural disaster struck Palo Verde and how often the plant conducts emergency-procedure drills.

Stump also wanted to learn about Palo Verde's backup power systems.

Problems arose at the Dai-ichi plant in Japan after a loss of power prevented its reactors from being safely shut down.

APS spokesman Jim McDonald said the company welcomed the opportunity to discuss plant safety with the commission.

"We want to answer any questions they have and want them to understand our commitment to safety and operational excellence," McDonald said.

Edington recently briefed Arizona legislators on the plant's safety procedures and the differences between Palo Verde and the stricken plant in Japan, according to McDonald.

He said Palo Verde's containment domes that prevent radiation from leaking into the atmosphere are significantly stronger than those at the Japanese plant and the Wintersburg area isn't prone to earthquakes.

"I am a strong proponent of nuclear power and I believe nuclear continues to be an absolutely essential component in a productive and reliable energy portfolio," Stump said. "Yet I believe it is critical that we revisit our own emergency procedures as new information and potential lessons emerge from this heartbreaking disaster in Japan."

Information from: The Arizona Republic, <http://www.azcentral.com>

Arizona Corporation Commission To Get Status Update On Nuclear Industry (PHOBIZ)

Phoenix Business Journal, March 22, 2011

The Arizona Corporation Commission will hold an information status update on the US nuclear industry on Tuesday in response to the ongoing problems at a Japanese nuclear complex.

Commissioners Bob Stump and Paul Newman both asked Arizona Public Service Co. and national officials to present an update in the wake of the accident at the Fukushima Daiichi nuclear power plant.

The Japanese complex has had problems with four of its six reactors — likely a partial meltdown of the fuel, officials have said. Fukushima Daiichi, on Japan's Pacific coast, survived the 9.0-magnitude earthquake, but its backup power generators were flooded out by the massive tsunami that followed. The generators were meant to provide cooling to the nuclear fuel.

APS operates Palo Verde Nuclear Generating Station about 50 miles west of Phoenix and is one of seven utility owners of the power plant. Salt River Project also owns a portion of Palo Verde.

The meeting will begin at 10 a.m.

Spent Nuclear Fuel Storage Comes Under Scrutiny (CHIT)

As plants around the country store their used fuel, experts and nearby residents worry about worst-case scenarios

By Julie Wernau and Lisa Black, Tribune Reporters

Chicago Tribune, March 22, 2011

Fourteen years ago, Zion nuclear power plant's last red-hot fuel rod was lifted from its reactor core and submerged into a pool of water, joining the rest of the plant's 2.2 million pounds of spent fuel. The nuclear waste was supposed to be entombed deep within Nevada's Yucca Mountain.

But the US Energy Department scrapped that plan last year. That left operators of Zion and more than 100 nuclear reactors in the US with the responsibility for storing on site the dangerous spent fuel. Chicago-based Exelon Corp. shuttered Zion in 1998 and another company is dismantling the complex piece by piece. The plan calls for Zion's waste to be encased in concrete-and-steel bunkers not far from Lake Michigan, possibly in perpetuity.

In the wake of Japan's disaster, the safety calculation involved in storing such waste has changed, experts say. More than 80 percent of the spent nuclear fuel in Illinois remains in pools.

In Japan, no one considered the possibility of a 9.0 earthquake and a devastating tsunami. Fuel rods at the crippled reactors have been exposed to air. They are heating up and emitting high levels of radiation, making it difficult for workers to get close enough to cool them. The lesson, experts say, is that nuclear safety seems more designed for most-likely scenarios, not worst-case scenarios.

"This is a once-in-a-millennium event — but we don't plan for those," Kennette Benedict, executive director and publisher of the Bulletin of the Atomic Scientists said Friday.

In Zion, a town of 25,000 about 50 miles north of Chicago, and at other towns where nuclear waste is stored, Japan's crisis has some questioning if the most unlikely events could happen and whether they would be protected.

In Illinois, 28,588 fuel assemblies, each containing a bundle of 200 rods and weighing about 600 pounds, are cooling in pools on the ground or above reactors as in Japan.

Positioned, up high, they are "very inviting targets for terrorists," said David Lochbaum, director of the Nuclear Safety Project of the Union of Concerned Scientists, and critics note that the buildings that house the pools are flimsy.

"No one has come up with a solution to safely store this waste for 10,000 years into the future," said Lochbaum.

The Energy Department says it is committed to ensuring it meets its long-term disposal obligations, but a plan hasn't been disclosed.

For safety reasons, law requires spent rods to cool in pools for five years before they can be moved into dry casks — stainless-steel canisters, encased in 3-inch-thick carbon-steel liners and covered in 2 feet of reinforced concrete.

Installing dry-cask storage infrastructure at a plant with two reactors would cost between \$20 million and \$30 million, and annual costs for buying casks, loading them and running a dry-cask storage facility are \$7 million to \$10 million, according to Exelon.

Unlike in Japan, Zion's fuel rods have been cooling for as long as 40 years.

"You can't have a meltdown," said Patrick Daly, general manager of EnergySolutions, which is dismantling Zion.

By 2020, EnergySolutions expects to turn the 240-acre site into an uncontaminated field of grass. Unless the federal government comes up with an alternative, 10 to 15 acres of the land will be home to 61 concrete and steel dry casks, each weighing 125 tons, used to store the spent fuel.

At a panel discussion Friday focused on Japan's crisis and hosted by the Chicago Council on Global Affairs, Robert Gallucci, president of the John D. and Catherine T. MacArthur Foundation, said the concrete monoliths were "a good interim solution" to the storage problem. He said he was a "very enthusiastic supporter of long-term dry storage." Gallucci previously served with the US State Department as a special envoy focused on the threat posed by the proliferation of weapons of mass destruction.

Even Lochbaum calls dry-cask storage "the cheapest insurance we can possibly pay."

So far, none of Zion's waste has been moved into dry casks. This summer a pad is to be built about 2,000 feet from Lake Michigan that would protect the casks from earthquakes.

Daly said spent fuel will be moved into dry casks by 2014. Meanwhile, cooling occurs through natural convection.

The casks are designed to withstand tornados and earthquakes, and are nearly impossible to steal, Daly said. Even if a cask was cracked, hazardous levels of radiation would be contained to the area around the cask because of the age of the fuel rods, he said.

Still, some who live near Zion are concerned about permanent storage of radioactive material in the area.

Roger Whitmore, owner of a Zion automotive store and past president of the Zion Chamber of Commerce said, "If we had a big earthquake or seiche," referring to a large wave from Lake Michigan, "what's (the waste) going to do, sweep into the lake?"

That's unlikely, said Michael Chrzastowski, senior coastal geologist at the Illinois State Geological Survey. Zion is built about 9 feet above the water level of Lake Michigan. The largest seiche -- a wave caused by air pressure and wind -- to hit Lake Michigan was 10 feet, he said. In such a case, he said, the area would only experience "nuisance"-level flooding.

Moreover, the lake side of the storage area is protected by a wall of boulders, he said.

Of more concern, he said, is an area about 2 miles north of the Zion plant, where erosion washes away the shoreline by as much as 10 feet per year.

"Shore erosion needs to be continually monitored along the state park shore and near the power plant," he said.

Daly said they are not monitoring the erosion, but if it became a problem, the company would take care of it.

Tribune reporters Michael Hawthorne and Ameet Sachdev contributed.

Local And State News From Virginia Business (VABIZ)

By Paula C. Squires

Virginia Business, March 22, 2011

There are plenty of lessons to be learned from the near meltdown of Japan's tsunami-wrecked nuclear power plant, but abandoning nuclear power should not be one of them. As Japan continued to struggle to gain control over its plant at Fukushima Daiichi that has been the reaction in Virginia from the halls of Congress, the Virginia governor's office, the state's largest utility and academia.

"It is irrational to rush to judgment and blame the effect of a major natural disaster on an industry which is actually so beneficial to this country and the whole world," said Alireza Haghighat, a professor in Virginia Tech's nuclear engineering program, referring to the catastrophic earthquake and tsunami that struck northeastern Japan on March 9. Instead, he added, the nuclear industry should assist Japan and learn from its experience.

Particularly in a state like Virginia where the nuclear industry has a strong presence, "It is important that the industry maintains its momentum in design, licensing and operation of a new generation of nuclear reactors," said Haghighat, a fellow of the American Nuclear Society and chairman of the board of the Southeast Universities Nuclear Reactors Institute for Science and Education. "Areva NP and B&W should learn from Japanese experience, and if necessary consider changes in their designs."

Paris-based Areva and Charlotte, N.C. -based Babcock & Wilcox have nuclear operations in Lynchburg. Virginia also has two nuclear plants in Louisa and Surry counties. Dominion Virginia Power, which operates the two nuclear plants, has applied to build a third nuclear reactor at its Lake Anna Power Station in Louisa. However, the company needs a partner to help finance the

project. "We don't have an equity partner yet. We want to keep the option open to meet future demand," said company spokesman Jim Norvelle.

Dominion expects the Nuclear Regulatory Commission to rule on its application in 2013. "Then it becomes a business decision, and we'll have to decide if we want to go through with it," Norvelle said.

Frank Settle, a chemistry professor at Washington and Lee University in Lexington, expects the Japanese crisis to weaken funding for new U.S. nuclear plants. "Nuclear power plants are very expensive to build — about \$10 billion a pop. The utilities don't have that kind of capital. So they have to go to the investment community, and the investment community was already a little bit squirrely about taking risks with nuclear power. I think this will make partners hard to come by in this environment."

Virginia Gov. Bob McDonnell doesn't want the state to abandon the construction of new nuclear reactors. McDonnell has pushed to make Virginia the energy capital of the East coast and supports nuclear as a part of the state's overall mix. In an interview with the Washington Post on March 18, he said: "I believe it would be most unwise to let this unprecedented tragedy lead to the retraction or abandonment of the American nuclear energy industry. Nuclear energy is clean, reliable, affordable and critical to generating the volume of electricity we need to power our homes and businesses and grow our economy."

The state's two nuclear plants generate about one third of Virginia's electricity. "They have multiple redundant systems to provide backup electrical power," McDonnell said. "The stations were also analyzed against worst-case acts of nature, such as earthquakes, floods and hurricanes, and modified as necessary to protect them. There are 19 emergency drills scheduled for this year."

President Barack Obama also isn't backing away from his support of nuclear power. However, in response to what happened in Japan with explosions, fires and radiation now being found in the country's food and water supplies, he is asking the NRC to conduct a comprehensive review of the safety of the America's 104 domestic nuclear plants.

While officials debate the safety of nuclear power, some Virginia businesses are assessing what ripple effects might flow from Japan's disaster. In Richmond, specialty insurer Markel Corp. was trying to calculate its earthquake insurance exposure in Japan. Richard R. Whitt III, the company's president and co-chief operating officer, noted that the areas affected were typically rural and residential. "We mostly write commercial insurance," he said. "Obviously we are talking to our brokers and they are talking to the insureds where they can." While information is limited at this time, Whitt has heard projections of insured losses ranging from \$15 billion to \$35 billion.

It's been a busy year for Markel. The insurer had exposure to the Australian floods as well as the earthquake in New Zealand. "Last year was a similar year," Whitt says. "In the first quarter, we had the Chilean earthquake and the earthquake in Haiti. There has been a high frequency of earthquakes in the last year causing large losses of life and economic damage." Four of the five costliest earthquakes and tsunamis in the last 30 years have occurred within the past 13 months, according to the Insurance Information Institute. Before the Japanese earthquake, insured earthquake losses worldwide dating back to February 2010 totaled an estimated \$23 billion.

In another part of the state, Patrick Wales, project manager for Virginia Uranium Inc. in Pittsylvania County, doesn't foresee an immediate impact on the company's plans to mine the undeveloped uranium deposits at Coles Hill near Chatham. The company is awaiting the results of two studies on uranium mining, which will be used by the General Assembly in deciding whether to lift a 29-year mining ban. The studies, one regarding health and safety and the other studying the socio-economic impact, are expected to be completed by Dec. 1. "The next session [of the General Assembly] is the earliest something could happen," said Wales.

The Coles Hill uranium deposit — the largest undeveloped uranium deposit in the US — could be a source for uranium used by nuclear plants. Wales says there is currently a need to increase the mine supply of uranium. "The world currently operates in a 50-million pound deficit; a 180-million pound demand and a 130 million pound primary mine supply. There already exists a need to close that gap regardless if any more nuclear plants are built."

Five groups opposed to lifting the uranium mining ban want Japan's nuclear problems to be considered in one of the studies being conducted by the National Academy of Sciences. In a filing with the NAS, opponents said study committee members should examine whether the nuclear power crisis will depress uranium prices, making the proposed Pittsylvania operation unsustainable after mining has begun.

Virginia Uranium dismissed the filing as a delaying tactic.

More On Nuke Plants' Earthquake Risk (FFLS)

By Rusty Dennen

Fredericksburg Free Lance Star, March 22, 2011

As the nuclear disaster in Japan continues, the Nuclear Regulatory Commission put out a Q&A addressing seismic issues at US nuclear power plants. The agency says it does not rank individual plants' risk of damage in an earthquake after an MSNBC story last week used NRC data to compile such a rating. It called the rankings "highly misleading." The MSNBC story listed the North Anna Units 1 and 2 as 7th out of the top 10 plants most likely to have reactor core damage in an earthquake. The topic is of interest here because North Anna Power Station is built in one of Virginia's active earthquake zones. See my most recent stories about North Anna here and here.

Japanese Reactors Are Similar Yet Different From Those In Virginia (NWPRTNWZ)

Newport News (VA) Daily Press, March 22, 2011

An article in last week's Daily Press addressed the likelihood of a commercial nuclear power plant failure in Virginia.

The article, prompted by a tsunami that has wreaked havoc on Japanese nuclear reactors, concluded that anything is possible but a similar event here is unlikely.

It included what, in hindsight, was an oversimplified statement.

The article states while the Japanese reactors are about the same age as the reactors at Surry Power Station, the "similarities end there."

It is true that the General Electric-designed Mark 1 boiling water reactors malfunctioning in Japan are different from the Westinghouse-designed pressurized water reactors at Surry. The containment structures look different, too.

But there are additional similarities. Both type of reactors are powered by enriched uranium, and both rely on large amounts of water and complex electrical systems to prevent the release of dangerous amounts of radiation.

The bottom line remains, however, that the chances of a nuclear accident — comparable to what's happening in Japan — are slim in Virginia.

Cuccinelli to sue EPA?

There were plenty of interesting comments made during last week's Chesapeake Bay hearing on Capitol Hill.

A House Committee on Agriculture subcommittee held the meeting to discuss how the US Environmental Protection Agency's plan to accelerate bay restoration would affect farmers.

Rep. Bob Goodlatte, R-Roanoke, dropped perhaps the biggest jaw-dropper by suggesting that Virginia Attorney Ken Cuccinelli is considering legal action against the EPA.

The possibility of Virginia's hard-charging lawyer suing the EPA to stop what many consider an unfunded federal mandate isn't much of a stretch. Remember, Cuccinelli has filed lawsuits to block federal health care reform and the EPA's effort to curb greenhouse gases.

A Cuccinelli spokesman declined to comment because he had not heard what Goodlatte said. Also, it's the attorney general's policy not to comment on potential litigation, the spokesman said.

If Cuccinelli jumps into the fray, he would join the American Farm Bureau Federation, which earlier this year announced it would fight the EPA in court.

Other groups, including the Hampton Roads Planning District Commission, are considering legal action, too.

NASA can crush

NASA plans to crush a giant-sized aluminum-lithium can Wednesday that the space agency says will aid in future rocket designs.

The test, which NASA Langley Research Center engineers will participate in, will occur at Marshall Space Flight Center in Alabama.

The can is 20-feet tall and 27.5 feet in diameter. It is expected to buckle when researchers subject it to 1 million pounds of force.

It will help engineers design "lightweight, safe, and sturdy structures" for space travel.

Liquor Lobby Tools And Spent Fuel Pools (Journal Inquirer)

By Chris Powell

Journal Inquirer, March 22, 2011

Connecticut's school kids are taught that the three branches of government are the legislative, executive, and judicial. But that's not how it looked at the recent meeting of the General Assembly's General Law Committee.

The big issue before the committee was repealing the ban on selling liquor on Sunday, legislation being advocated by Democratic state Rep. Kathleen M. Tallarita and Republican Sen. John A. Kissel, both from Enfield, whose liquor stores suffer from the Sunday sales ban, what with Massachusetts being next door and allowing its liquor stores to open on Sunday. The only

reason against the repeal bill is the desire of most Connecticut liquor stores to suppress competition. They long have formed an influential special interest, and so theirs is the only product whose sale on Sunday is still prohibited by law.

A Quinnipiac University poll the other day found overwhelming support for repealing the Sunday sales ban, 66 to 31 percent, the biggest margin ever registered on the issue by the poll. But the public seldom acts much on its own opinion. What is deeply felt and acted upon is special-interest opinion. Every legislator's district has a few liquor store operators whose livelihoods depend on using the law to suppress competition, and they have a lobbyist and make themselves heard directly to their legislators, not just to a poll taker on the telephone. So a majority on the General Law Committee didn't want to offend this special interest. Most members wanted the Sunday sales bill to die quietly from the committee's failure to report it favorably, without even a vote. But Senator Kissel meant to put the committee on the record. He sought to attach the bill as an amendment to another bill and then moved for a roll-call vote on the amendment. When that was denied, Kissel moved for a roll-call vote on whether to have a roll-call vote. Only Kissel and Tallarita supported having a roll-call vote on the amendment, and Kissel's motion was defeated 13-2. Most members of the committee were determined to hide from the issue. Subservience to the special interest was that great.

Voting against accountability for themselves and doing the liquor lobby's bidding were Sens. Paul R. Doyle, D-Wethersfield; Carlo Leone, D-Stamford; Kevin D. Witkos, R-Canton; and Anthony J. Musto, D-Trumbull; and Reps. Joseph J. Taborsak, D-Danbury; David A. Baram, D-Bloomfield; Penny Bacchiochi, R-Somers; Rosa C. Rebimbas, R-Naugatuck; Emil Altobello, D-Meriden; Anthony J. D'Amelio, R-Waterbury; Louis P. Esposito Jr., D-West Haven; Sandy H. Nafis, D-Newington; and Frank N. Nicastro, D-Bristol.

Conveniently absent were Reps. William Aman, R-South Windsor; Lonnie Reed, D-Branford; and Hector L. Robles, D-Hartford.

Advocates of repealing the Sunday sales ban may find some other mechanism for raising their bill. In the meantime, the civics curriculum in Connecticut's schools should start teaching that the three branches of government aren't the legislative, executive, and judicial but the teacher unions, the lawyers, and the liquor stores.

Responding to the nuclear power disaster in Japan, President Obama says he has ordered a "comprehensive review" of nuclear power plant safety in the United States. Maybe the president has noticed that the Japanese disaster involves the cooling pools of spent nuclear fuel rods – rods that will keep piling up at US nuclear power plants because the Obama administration has canceled the long-delayed plans to build a federal nuclear waste warehouse underground at Yucca Mountain in the Nevada desert.

It's not that such a warehouse suddenly wasn't needed anymore. It's that the federal government has never been able to summon the political courage to tell little Nevada, mostly wasteland owned by the federal government itself, that the national interest sometimes must take precedence over the wishes of the few.

At a hearing of the House Energy and Commerce Committee the other day, US Rep. John Shimkus, R-Ill., reminded Energy Secretary Steven Chu that there are 11 nuclear plant spent fuel pools within 40 miles of downtown Chicago.

There's also a big spent fuel pool at the Millstone nuclear power complex in Waterford, by far the biggest environmental hazard in Connecticut.

Every nuclear plant will always need such a pool for cooling spent fuel rods until they can be transported for permanent storage. But the federal government's negligence has turned these pools into permanent storage themselves, often in densely populated areas. No more studies are needed to know that the country will be safer when its nuclear waste is in a wasteland.

Constellation: Lessons From Japan Will Make A Safe US Nuclear Industry Safer (BSUN)

By Brew Barron

Baltimore Sun, March 21, 2011

As a leading producer of safe, reliable and economical electricity from nuclear energy in Maryland and New York, we take seriously our role to communicate about how the Japan situation impacts our industry and energy facilities.

We at Constellation Energy Nuclear Group LLC (CENG) extend our sincere sympathies to those suffering due to the tragic earthquake and tsunami. Our hearts are with those in Japan and those who have family and friends in the region. Our stakeholders (Constellation Energy and the EDF Group) are providing financial donations, and the world's nuclear industry is providing supplies and technical and humanitarian support.

Thanks to the heroic efforts of the plant employees and emergency response workers at Fukushima Daiichi, we understand conditions at all six of the reactors have significantly improved. As of this writing on Monday, the primary reactor containment

structures of each of the three reactors that were in operation at the time of the tsunami were all reported to be intact. We also understand that radiation levels both on and off-site have been decreasing.

Nuclear energy is our nation's current largest source of low-carbon electricity and is a significant producer of 24/7 electricity. It helps preserve our Earth's climate, avoiding ground-level ozone formation and acid rain. The 104 US reactors produce about 20 percent of our country's electricity, with safety and environmental stewardship as our goals.

I have worked in the nuclear energy industry for four decades. Safety is our passion. Nothing comes before the protection of our employees and communities. Our industry's highest commitments are safety and continuous improvement. CENG employees live by these overriding principles, and as a result, our nuclear power plants are safe.

After the Sept. 11 terrorist attacks, all US nuclear energy facilities underwent comprehensive reviews. The objective of these safety and security assessments was to evaluate severe scenarios that are beyond existing regulatory requirements to identify extraordinary and additional protective measures that assure US plants can withstand extreme events.

We have invested millions of dollars into CENG's Calvert Cliffs facility in Maryland and the Ginna and Nine Mile Point sites in New York to make them even more secure and safe.

We agree that a fresh review of the industry, with a focus on protective actions in the event of unusual natural events, is appropriate. We are a business built on a foundation of continuous learning and reaching new levels of operational excellence.

Lessons will be learned from the events in Japan, but we are not waiting to begin to take action. All US companies with nuclear power plants are already verifying their capability to maintain safety even in the face of severe challenges, including natural disasters. Our CENG sites are designed, built and maintained to sustain severe man-made and natural disasters. We also have multiple safety and security features and redundant backup systems.

An integral part of our safety commitment is to keep the public and government officials fully informed in the unlikely event of an accident impacting any facility. We routinely conduct intense training exercises and drills to test our ability to effectively implement our emergency response plans with local, state and federal government officials as well as with the media. The Nuclear Regulatory Commission independently measures our performance in these areas, and the Federal Emergency Management Agency evaluates the state and local responses to those scenarios.

CENG's roots are deep in the communities we serve. We operate with the community's consent and value our strong partnerships with local, state, regional and national leaders and organizations.

We feel fortunate to operate our business and employ thousands of outstanding people in Maryland and New York. Our dedicated employees are committed to performing work at the highest levels of safety and operational excellence in producing electricity for millions of homes and businesses.

Rest assured, we will maintain our unwavering commitment to safety and our staunch support for the continuous application of lessons learned.

Brew Barron is president and CEO of Baltimore-based Constellation Energy Nuclear Group. His e-mail is brew.barron@cengllc.com.

Environmental Groups Say Cuomo Administration Should Address Safety Concerns At Upstate Nuclear Facilities (2011-03-21) (WRVO)

By Michael Benjamin

WRVO-Radio, March 22, 2011

In the wake of the nuclear crisis in Japan, Lieutenant Governor Robert Duffy is meeting with Nuclear Regulatory Commission officials tomorrow to discuss concerns over the safety of the Indian Point nuclear power plant near New York City.

A number of environmental advocacy groups are sending a letter to Governor Andrew Cuomo, urging his administration to go further and discuss concerns at all the state's nuclear facilities, including the three in Oswego County (Nine Mile Point 1, Nine Mile Point 2, and FitzPatrick) and one in Wayne County (Ginna).

Laura Haight is an environmental expert with the New York Public Interest Research Group (NYPIRG). She says there are significant concerns at the Central and Western New York plants as well.

"Oswego ranks fourth in the nation for the amount of high-level radioactive waste - spent fuel rods - stored on site," Haight says, "so there's a lot of issues at that site which, quite frankly, I don't think people are aware of."

Two of the plants in Oswego County (Nine Mile Point 1 and FitzPatrick) also have the same model boiling water reactor and containment design as the Fukushima plant in Japan that experienced a near-meltdown after the earthquake and tsunami that hit that country recently. Haight says the plants in Oswego County are about as far from Albany as the Fukushima plant is from Tokyo, where officials have noted higher levels of radiation after the crisis at Fukushima.

Exelon Faces Regulatory Fallout After Japanese Nuclear Disaster (CRCHIBIZ)

By Steve Daniels

Crain's Chicago Business, March 22, 2011

Exelon Corp.'s nuclear power plants are an ocean and half-a-continent from the crippled reactors in Japan, but fallout from the still-unfolding disaster is headed straight for the company.

The biggest nuclear plant operator in the United States, Chicago-based Exelon will bear the full force of an expected crackdown by regulators spurred to action by uncontrolled radiation releases across the Pacific. Already, President Barack Obama has ordered a full-scale review of nuclear power plants in this country, and Illinois Gov. Pat Quinn is considering raising fees on Exelon's six power stations in the state.

"I just see lots of red tape and regulatory scrutiny" for Exelon and other nuclear power companies, says Hugh Wynne, a utility analyst at Sanford C. Bernstein & Co. LLC in New York.

It couldn't come at a worse time for Exelon, which is scrambling to avert a profit slide next year and revive its languishing stock.

CEO John Rowe's growth plans hinge on adding power to its 10 nukes and buying more via an acquisition. But he said last week that Exelon is reconsidering a \$3.8-billion capacity expansion in response to the crisis in Japan. Analysts believe the disaster also derails any near-term acquisition plans Exelon might have.

Now the company must play defense as regulators tighten enforcement of existing rules and lawmakers propose new ones, in a process likely to add costs and hinder growth. Exelon's stock, already trading at about half its level of three years ago, fell 7.3% last week to \$40.03.

Mr. Rowe told Bloomberg News last week that he expected the Nuclear Regulatory Commission to perform special safety reviews of all the nation's nukes—something Mr. Obama later ordered.

SIMILAR REACTORS

A quarter of the nuclear power Exelon generates comes from 30-plus-year-old reactors that, like the Japanese plant damaged by a devastating March 11 earthquake and tsunami, were built by General Electric Co. and are of the same type and vintage. Those include four reactors at two Illinois plants, the Quad Cities facility and the Dresden facility in Morris.

"Our management believes they're safe; I believe they're safe," Mr. Rowe said last week.

Depending on what those regulatory reviews turn up, costs to Exelon could range from modest to substantial.

Improvements to backup power systems might be expected in the wake of their failure in Japan, but costs of that sort would be on the lower end, experts say.

Bigger-ticket upgrades could include shoring up pools where spent fuel rods are stored at the plant sites, says Eric Beaumont, an analyst at Chicago-based investment firm Cobia Capital LLC and a former nuclear safety analyst at Exelon's Commonwealth Edison Co. Those could run in the tens of millions of dollars per plant, he says.

Of course, if the Japanese containment vessels fail, prompting the NRC to seek major upgrades of US plant vessels, then costs could skyrocket. But Mr. Beaumont considers that unlikely, noting US containment vessels from 1960s- and 1970s-vintage plants were bolstered in the '80s.

As for its capacity-expansion program, which Exelon has said would produce up to 1,500 megawatts of additional power, or the equivalent of a new reactor, Mr. Rowe said, "I believe we will be able to add some capacity to our different plants. We will, of course, give that a fresh look in the wake of this event."

An Exelon spokeswoman says the company still intends to make \$475 million in capacity upgrades budgeted for this year. That's primarily for "turbine replacements" that are part of long-term maintenance plans at the plants, she says.

The NRC must approve plant changes to add capacity, which will presumably fall under sharper scrutiny, too.

'PRESS THE PAUSE BUTTON'

"These nuclear plants were believed to have operating lives of about 40 years," says Howard Learner, executive director of the Environmental Law and Policy Center in Chicago and a frequent Exelon critic. "Exelon has run the plants really hard. . . . It is wise and prudent to press the pause button" on the expansion plans.

Among the plants Exelon is targeting for major upgrades: the LaSalle station in Marseilles, where it plans to boost capacity by 16% within five years. Less-ambitious upgrades are planned for the Quad Cities, Dresden, Braidwood and Byron plants in Illinois.

The spokeswoman says the upgrade program is intact but could change if economic or regulatory conditions warrant.

The disaster in Japan also complicates Mr. Rowe's acquisition plans. Regulators could demand expensive plant upgrades as a condition of approving any deal. Likewise, acquisition targets must consider the state of Exelon's nukes when deciding whether to accept the company's stock in any transaction.

"Until we know what the NRC wants, it's going to make due diligence a nightmare," Bernstein's Mr. Wynne says.

The Exelon spokeswoman declines to discuss the possible impact of regulatory changes on deal-making.

Florida Utility To Buy Into Future S.C. Nuclear Plants (MYRTLE)

By Warren L. Wise

Myrtle Beach Sun News, March 22, 2011

A Florida utility plans to buy into Santee Cooper's share of two new nuclear units to be built north of Columbia amid the uncertainties for the industry following the disaster in Japan.

Santee Cooper said Monday it has signed a letter of intent to negotiate a purchase power agreement with Orlando Utilities Commission for a portion of the state-owned company's stake in the planned \$10 billion new reactors at V.C. Summer Nuclear Generating Station in Fairfield County.

The Florida company also could buy part of Santee Cooper's ownership in the joint venture.

Santee Cooper owns 45 percent of the V.C. Summer expansion. Cayce-based South Carolina Electric & Gas Co. owns 55 percent. The two new nuclear units are projected to come online in 2016 and 2019.

The letter of intent with the Florida utility is for 5 percent to 10 percent of the capacity and output from Santee Cooper's interest in the new units. The letter of intent also includes as part of the potential transaction an option for Orlando Utilities Commission to acquire a portion of Santee Cooper's ownership stake.

"We are hoping to wrap things up by late summer or early fall," Santee Cooper spokeswoman Mollie Gore said of the Florida utility deal.

Orlando Utilities Commission's pending deal with Santee Cooper has been in the works for several months, OUC spokesman Tim Trudell said.

He could not say whether discussions were held internally to rethink the proposal after the 9.0-magnitude earthquake and tsunami in Japan on March 11 that crippled several nuclear reactors and spewed radiation.

"OUC continues to work toward diversifying its generation portfolio, and nuclear plays an important role moving forward," Trudell said. "The letter of intent demonstrates OUC's interest in the V.C. Summer project and confidence in its partners."

Orlando Utilities Commission, Florida's second-largest municipal utility, has about a 4 percent ownership in two nuclear facilities - Crystal River and St. Lucie - on opposite sides of Florida, Trudell said.

Santee Cooper wants to cut its ownership in the V.C. Summer nuclear expansion project to 20 percent and is looking for one or more partners to pick up 25 percent of its interest.

Last year, Santee Cooper started to re-evaluate the need to invest in new power plants after its biggest customer, Central Electric Power Cooperative, announced it would shift 1,000 megawatts of its load to Duke Energy beginning in 2013.

Central Electric's decision, combined with reduced demand because of the recession and the prospect of new federal regulations for coal-fired plants, forced the Moncks Corner-based utility to halt its three-year drive to build a \$1.2 billion generator near Florence in 2009.

Gore said the Florida deal does not preclude bringing other investors on board.

"We are continuing to review our level of participation," she said. "We are motivated by making sure what is best for our customers and meeting our needs."

She deferred questions about the future of new nuclear generation in light of the problems encountered in Japan to SCE&G, which is leading the licensing process for the new nuclear units.

SCE&G spokesman Eric Boomhower said Santee Cooper's pending deal with the Florida utility would not have any effect on the management, construction or operation of the two new units.

Preliminary construction of roads, grading and support facilities is under way at the Jenkinsville facility, but work on the two new nuclear reactors awaits approval of the Nuclear Regulatory Commission, which is expected later this year or early next year, Boomhower said.

SCE&G officials said last week they are forging ahead with plans for the new nuclear units because their design and the geography are different from that in Japan.

"We remain committed to our new nuclear generation strategy and our intent is to remain on schedule," said Kevin Marsh, president and chief operating officer at Scana Corp., SCE&G's parent company.

NextEra CEO Says Nuclear Plants Well-prepared For Disasters (PALMBEACHP)

By Susan Salisbury

Palm Beach Post (FL), March 22, 2011

WEST PALM BEACH — NextEra Energy Inc., the Juno Beach-based parent company of Florida Power & Light Co., is a major producer of the power source that has been thrust to the front and center since the catastrophe in Japan.

In fact, it's the nation's third-largest owner and operator of nuclear power plants, NextEra Energy Inc. CEO and Chairman Lewis Hay said Monday. He has been chief executive officer since 2001 and chairman since 2002.

"We were quite happy with that until the events in Japan a little over a week ago. We still are happy, not to belabor that, but it has definitely been something that has caught our interest," Hay told more than 300 people at a Palm Beach County Business Development Board and Economic Council luncheon.

Although the crisis is still unfolding, the focus is on getting the nuclear reactors at Japan's Fukushima Daiichi plant to a safe situation, Hay said.

"The nuclear industry is a unique industry. We all pull together and help one another out," he said.

When any type of problem occurs at a nuclear plant, the industry works to solve it. Later, whatever lessons are learned are incorporated into operating procedures and plant design, Hay said.

"I can assure you that will happen again following this event," Hay said.

He outlined several differences between the company's Florida nuclear plants and the Fukushima plant.

FPL's plants have pressurized water reactors, while the plant in Japan has boiling water reactors.

"The containment structure, the concrete that surrounds the plants here, is far more robust than what you have in Japan," Hay said.

In addition, the plants here have more redundant backups in their ability to cool the reactors.

After the terrorist attacks of Sept. 11, 2001, the company and regulators realized the potential terrorist threats and prepared for a worst-case scenario.

"We have all sorts of pumps and hoses and pipes and procedures. We drill our people on a very regular basis deploying this type of equipment.

"Rest assured, we have everything we need to cool those reactors down," Hay said.

If a hurricane is approaching, the company shuts its nuclear plants down well in advance of winds in excess of 75 mph, Hay said.

He provided an overview of NextEra's operations, stressing the size of the company, which is ranked 147 on the Fortune 500 list.

NextEra and its subsidiaries, FPL and NextEra Energy Resources, rank second in the nation in terms of generating capacity with 42,588 megawatts. By the end of this year, Hay said he expects the company to be No. 1.

While the nation has an estimated 300-year supply of natural gas, the sources of energy it uses should be diverse, said Hay, who would like to see more solar plants built.

Proposed federal legislation dealing with climate change has gone off center stage for now, but it will be back, he predicted.

The Clean Air Act, passed in 1990, has been in litigation for almost 20 years, and Hay disagrees it will be burdensome and tax the economy.

"I don't think it's going to be the train wreck that some people are saying it will be," Hay said.

Nine Mile Point Unit I Taken Offline For Scheduled Refueling (SPS)

By Debra J. Groom

Syracuse Post Standard, March 22, 2011

Scriba, NY -- Nine Mile Point Unit I nuclear plant has been shut down for scheduled refueling and maintenance, said Jill Lyon, speaking for Constellation Nuclear Energy Group, the plant's owner.

Lyon said the plant is taken offline every 24 months to refuel the reactor and perform normal maintenance work and inspections. Items such as motors, valves and seals are checked and fixed if needed.

UPDATE 1-Constellation Shuts NY Nine Mile 1 Reactor To Refuel (REU)

By Soma Das

Reuters, March 22, 2011

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

Judge Dismisses Oswego School District Challenge Of Nuke Plant Tax Agreement (SPS)

By Debra J. Groom

Syracuse Post Standard, March 22, 2011

Oswego, NY – The petition filed by the Oswego school district challenging the tax agreement with Nine Mile Point Unit I has been dismissed in state Supreme Court.

In a ruling dated Friday, Justice Hugh Gilbert dismissed the school district's petition stating it should not have been filed as a challenge to the assessment set by the Scriba Board of Assessment Review.

He said the assessment only can be challenged in a tax grievance petition. But then he also ruled the school district cannot use this procedure to challenge the assessment because only the property owner can file a tax grievance.

Lawyer Paul Sheppard, of Binghamton, who represents the school district, said the district has to decide whether to appeal the decision.

"It is my understanding the district has not made a determination on this," Sheppard said Monday afternoon.

School district Superintendent William Crist also would not comment on the ruling. "We just received it from our attorney and until our attorney and the board goes over it, there will be no comment from the district."

Listed as defendants in the school district's suit were the town of Scriba, Oswego County, Scriba's Board of Assessment Review, the town's assessors, Constellation Nuclear Energy Group and Nine Mile Point Nuclear Station.

The school district began the legal challenge in August after the Scriba Board of Assessment Review assessed Nine Mile Unit I at \$280 million for school tax purposes. The town of Scriba, Oswego County and the district had negotiated a tax agreement with the plant's owners, Constellation Nuclear Energy Group, but only Scriba and the county approved it.

The school board thought the plant should be assessed for \$600 million, the value set by George Sansoucy LLC, of New Hampshire, a firm that specializes in appraising nuclear plants.

With the \$280 million assessment, the school district was to receive about \$6 million for 2010-11, about \$4 million more than it received in the nuclear plant's former payment in lieu of taxes agreement for 2009-10.

Lawyer Kevin Caraccioli, who represents the town of Scriba, said if no appeal is filed or if an appeal is denied, town, county and school district personnel again can sit down with Constellation officials to negotiate a tax agreement for Nine Mile Unit I and Unit II. Unit I's PILOT expired in December while Unit II's PILOT expires in December 2011.

"I am pleased with Justice Gilbert's decision," said Scriba Supervisor Kenneth Burdick. "I always felt that the actions of the Town of Scriba were justified. This decision confirms my belief. I hope the parties can get back to negotiating a comprehensive agreement that will benefit the entire community."

Lawsuit Dismissed Against Constellation Energy Group (YNN)

YNN News, March 22, 2011

OSWEGO, N.Y. – The State Supreme Court dismisses a civil lawsuit filed by the Oswego City School District. The lawsuit was filed against the Town of Scriba, the County of Oswego, and the owners of the Nine Mile Point Unit One nuclear power plant.

It stems from the proposed nuclear plant tax agreement with Constellation Energy Group. Earlier this year, Constellation Energy agreed to nearly triple its tax payments for one year but the school board felt that the deal did not reflect current tax rates. So they rejected the plan.

The district filed the suit in late July asking for the 2010 assessment tax roll to be reviewed for Nine Mile Point and corrected. However that appears unlikely to happen as a judge ruled against the schools, dismissing their case.

Conn. Lawmakers Consider Tax On Electricity Generators As Critics Cite Rising Cost Of Power (AP)

Associated Press, March 22, 2011

HARTFORD, Conn. — Connecticut lawmakers are set to vote on a new tax on generators of electricity to provide relief for ratepayers and raise revenue.

The legislature's Energy and Technology Committee is scheduled to meet Tuesday to consider the bill, which would impose a tax on generators that use oil, coal and nuclear power. The state Office of Consumer Counsel says the tax would raise \$340 million in revenue, with \$332 million from Connecticut's Millstone nuclear plants.

Energy provider Dominion Resources, which operates the plants in southeastern Connecticut, says the tax will raise prices for consumers. Richmond-based company also says the measure is discriminatory because it is applied to only a few energy sources.

Individuals and businesses have complained that prices have risen dramatically since Connecticut deregulated electricity in 1998. They have pressured lawmakers to find ways to cut costs.

Several Obama Cabinet Secretaries Also In Latin America (WP)

By Ed O'Keefe

Washington Post, March 22, 2011

President Obama waves from Air Force One as he arrives in Brazil on Saturday. (Jason Reed/Reuters) President Obama and the first family aren't the only ones taking in the sights and pressing the flesh this week in Latin America.

Eight Cabinet secretaries and top officials from other agencies are along for the ride, according to a list provided by the White House.

The sight of Cabinet secretaries traveling with the president while abroad is nothing new — Treasury Secretary Timothy Geithner, Secretary of State Hillary Rodham Clinton and others have accompanied Obama to summits and other appearances all over the world.

But the current five-day trip through Brazil, Chile and El Salvador includes some interesting traveling companions. Take a look:

IN BRAZIL:

- Treasury Secretary Timothy Geithner: Attended bilateral meetings with Brazilian officials, a formal lunch hosted by Brazilian President Dilma Rousseff, and a meeting with US and Brazilian CEOs where Obama spoke.
- Commerce Secretary Gary Locke: Attended the bilateral meetings, hosted the CEO meeting and also attended Rousseff's formal lunch.
- US Trade Representative Ron Kirk: Attended the bilateral meetings, the CEO meeting and the formal lunch.
- Export-Import Bank Chairman Fred Hochberg: Attended the bilateral meetings, the CEO meeting and the formal lunch.
- EPA Administrator Lisa Jackson: Attended the CEO meetings and the formal lunch.

(Energy Secretary Steven Chu was also scheduled for the trip, but canceled to focus on the US response to the Japanese earthquake, according to the White House. Interior Secretary Ken Salazar is also scheduled to visit Brazil in the coming weeks to follow up on energy-related topics discussed during Obama's trip.)

IN CHILE:

Kirk will attend bilateral meetings with Chilean officials.

IN EL SALVADOR:

- Labor Secretary Hilda Solis: Scheduled to attend bilateral meetings with Salvadoran officials and a formal dinner meeting session. (Solis is the first Hispanic woman to serve in the US Cabinet. Her mother is from Nicaragua.)
- USAID Administrator Rajiv Shah: Scheduled to attend the bilateral meetings and the dinner meeting.
- Peace Corps Director Aaron S. Williams: Also scheduled to attend the bilateral meetings and the dinner meeting.

Was NRC's Decision To Close Yucca Legal? (EED)

By Hannah Northey

E&E Daily, March 18, 2011

The chairman of a House Energy and Commerce subcommittee is challenging whether the Nuclear Regulatory Commission had the legal authority to suspend a safety review of Yucca Mountain in Nevada as a permanent spent nuclear fuel repository.

Rep. John Shimkus (R-Ill.) warned NRC Chairman Gregory Jaczko during a budgetary hearing Wednesday that "you better be double checking your facts" on whether the move was legal.

Shimkus, who heads the Environment and the Economy subpanel, said it is "a stated federal position by law that Yucca Mountain should be open, that's the legal authority; there's no legal authority to close Yucca Mountain."

The repository has gained increasing attention in past days as lawmakers and regulators scrutinize the safety of on-site storage of spent fuel at utilities across the nation. Jaczko yesterday said spent fuel pools at the Japanese Fukushima Daiichi nuclear plant could be without water, creating a dangerous situation for spent fuel rods that could ignite and emit radioactive elements.

Democrats are pushing for the permanent closure of the site. Rep. Shelley Berkley (D) of Nevada said yesterday that in light of the nuclear crisis in Japan, it is hard to believe anyone would argue that "it's a good idea to unleash decades of nuclear waste shipments on communities across the US incapable of dealing with the death and environmental destruction that a disaster involving this radioactive garbage is capable of inflicting."

After the Obama administration decided to stop support for the project, the Department of Energy last year submitted a filing with NRC to pull its application to develop the site in Nevada.

But NRC's Atomic Safety and Licensing Board ruled that DOE could not pull its application to construct a permanent nuclear waste repository in Yucca Mountain. The board said that unless Congress directed otherwise, DOE could not "single-handedly" derail the legislative process and questioned whether the department acted because the site was unsafe or simply because it was a "matter of policy" (E&ENews PM, June 29, 2010).

DOE appealed the board's decision to the five-member NRC. Jaczko said at Wednesday's hearing that the commission has not yet come to a final determination on whether it will let the board's decision stand.

But Jaczko last October ordered a closeout of a staff review of DOE's application, in accordance with NRC's budget request for fiscal 2011. Consequently, there was \$10 million in NRC's 2011 budget for closing out the program, and no money requested for Yucca Mountain in the agency's fiscal 2012 budget, the commission said. NRC is now gathering information it has collected for a technical evaluation that will be made public but will not include regulatory conclusions.

Shimkus joined the ranks of many Republicans in accusing Jaczko of delaying NRC's final vote — in light of the fact the opinions already had been formed and circulated — and questioning the chairman's legal authority to close out the review of the project.

Jaczko said he made the decision to close out the review and that "my legal authority was as chairman of the commission."

DOE is already facing legal challenges from Washington state, South Carolina and other plaintiffs that filed a lawsuit in the US Circuit Court of Appeals last year, charging that the Obama administration overstepped its authority in attempting to shut down the project. The opening arguments will be heard next week (E&E Daily, March 16).

In addition to challenging the legality of DOE's decision to withdraw its application under the Nuclear Waste Policy Act, parties to the lawsuit argue that the decision to end the NRC staff review of the Yucca Mountain project was based on "inside baseball" and that the chairman moved ahead without a decision by the full commission.

The National Association of Regulatory Utility Commissioners also joined the lawsuit against the DOE. Association spokesman Rob Thormeyer said the group is "crystal clear" on the law barring DOE's filing to withdrawal its application.

"We think the oral argument is really going to be a slam dunk because they haven't followed the letter of the law," he said.

NRC and DOE have said they will not challenge the court's decision.

Yucca Has Allies, Even As Japan Suffers (LVS)

Catastrophe shows risk of storing nuclear waste

By Brian Greenspun

Las Vegas Sun, March 21, 2011

We are constantly reminded of Mother Nature's cruel bent: Hurricanes named Andrew and Katrina and now, earthquakes and tsunamis in Japan that have culminated in, as I write this, untold thousands of deaths, many times more injuries, hundreds of billions of dollars in destruction and, perhaps worse yet, a nuclear meltdown.

That's why it should give Nevadans pause when we hear Republicans in Congress threaten to reopen Yucca Mountain.

This is not a political column. Rather, it is an attempt to separate the politics of money from the policies of good government and sane stewardship of the environment and the right of the people to live secure in the belief that their government is not going to do them in.

The Las Vegas Sun, more than any other media organization in this state and, for a period of time the only medium to do so in Nevada, has been railing against the thought of using Yucca Mountain as the dumping ground for the nation's high-level nuclear waste for almost 30 years. In the early days we were alone in warning about the accidents that were inevitable. The political reality decades ago — little or no competent representation in Washington — allowed Nevadans to be set upon by larger states that didn't want the deadliest substances known to man to rest, uncomfortably, in their backyards. We were singled out for special treatment by the nuclear power industry, its desire for riches at our expense and its lackeys in Congress only too happy to shove that stuff down our underrepresented throats.

It took Nevada's senior US senator, Harry Reid, together with President Barack Obama, to finally drive a stake through the heart of the radioactive beast that threatened our lives and livelihoods. But, just like the vampires of old and new movies, that beast just doesn't want to stay dead.

Instead, the nuclear power industry in this country, working through its minions in the GOP-controlled House of Representatives, is doing its best to breathe life back into the moribund Yucca Mountain. Fighting to revive the dumpsite is just one of the consequences of the last election.

What is interesting, though, is that the reasons given for the resurrection: Nuclear waste disposal in Nevada is safe, and we don't want to happen here what just happened in Japan. That's what is coming out of Washington these days despite indisputable evidence to the contrary. It makes you wonder what planet these folks in Washington think Nevadans are living on! We may vote for crazy people from time to time, but that doesn't mean that we are.

At the heart of the Yucca Mountain debate is this: The federal government and the Yucca support staff always believed it was responsible, reasonable and desirable to build a nuclear waste dump in the middle of the third most active earthquake zone in the country. And, deep geologic burial would take place in one of the most porous mountains around — that means water flows from its top through the nuke canisters, corroding them on the way through, and then into the water table below — and you have the makings of an environmental disaster.

Cutting through the miles of paperwork defending the decision of politicians almost 30 years ago, the truth remains that Yucca Mountain is the wrong place for the dump. And, knowing what we know today, it is highly likely that burial is the wrong answer to the question of what to do with the most poisonous substances known to man.

So, what can we learn from the tragedy unfolding in Japan?

Assuming the worst hasn't happened by the time this goes to print, the threat of and, hopefully, the avoidance of a nuclear meltdown are both the most horrific consequence of man's arrogance and the luckiest of outcomes for people who depend on government and industry to keep them safe.

Assuming it gets worse? Just further proof of how wrong we can be.

Inherent in the Yucca Mountain argument, as I am certain it was in the Japanese decision to place nuclear power generating plants at the water's edge — let's not even talk about California's decision to build nuclear plants on fault lines throughout the state — is the belief that science can engineer around any potential challenges.

Those who argue to open Yucca Mountain have to believe that drip shields — which do not exist today — can be built to keep water out of the mountain and away from canisters holding nuclear waste for thousands of years. They have to believe that canisters — which do not exist today — can be built of sufficient strength and durability to keep that garbage out of the environment regardless of what natural or unnatural calamity should occur. And they have to believe that thousands of trucks and trainloads of radioactive waste can be safely transported across the country, through towns and cities, without a hint of an accident. Once they get all that down, they have to believe that an earthquake will not happen over the next thousands of years, causing all the deadly garbage to drop into the water table that nourishes much of the Southwest, including Las Vegas!

That is a lot to believe, especially in light of what the Japanese people had to believe to build the nuclear plants where and how they did.

First, they had to believe the plants could withstand an earthquake. It appears they mostly did. Then they had to believe they could survive a resulting tsunami that would devastate the region and cause all kinds of power outages. Or they had to gloss over that risk and assume it would never happen. Then they had to believe that the fail-safe programs at the plants, the backup generators and cooling systems that were designed by top-notch engineers, and the simple things, such as electrical connections, would all work flawlessly.

I am not picking on the Japanese thought process or the people — if anything, we have to admire their discipline and heroic selflessness as they try to prevent an even worse disaster — for thinking the way they did. If they didn't rationalize those problems away, they could never have built those plants the way they did.

But I do take issue with any American lawmaker who believes that the problems inherent in Yucca Mountain can or should be rationalized away on the altar of engineering solutions and current science. We have living — and dying — proof that that kind of thinking just doesn't work.

The Japanese people fooled with Mother Nature and lost big time when she decided to throw a few curveballs their way. The best engineering and scientific minds on the planet were no match for Mother Nature once she decided to show us her stuff.

What makes anyone in this country think we know more or know better than the Japanese? What makes anyone think earthquakes and truck accidents and terrorist missiles and just plain, old stupid mistakes will not happen over the next few thousand years, potentially unleashing thousands of tons of high-level radioactive poison on the lives of Americans who expect their government to protect them, not destroy them? With so many lives in the balance, what makes us believe we should fool with Mother Nature?

EDITORIAL: Obama's Nuclear Negligence (WT)

Toying with waste storage exposes America to Japan-type disaster

By The Washington Times

Washington Times, March 22, 2011

The ongoing crisis at Japan's damaged nuclear power plants raises the issue of whether our own radioactive materials are vulnerable to similar catastrophes. The states of South Carolina and Washington will argue today before the US Court of Appeals for the District of Columbia that the Obama administration had no authority to order the closing of the Yucca Mountain disposal facility in Nevada. That project's purpose had been to move American plants away from the radioactive waste-storage model used in the land of the rising sun.

The worst of the radiation from the Fukushima Dai-ichi facility is not emanating from the reactor cores, but from pools where spent nuclear fuel rods are stored. Most spent fuel in the United States is stored in the same fashion or in dry casks located on-site at the nation's 104 nuclear power facilities. Those were meant to be temporary depots that would be emptied when what was supposed to be the permanent storage site, Yucca Mountain, was completed. Instead, President Obama, with the strong encouragement of Nevada's Democratic Sen. Harry Reid, has spent the past two years dumping obstacles in the path of the facility's opening.

Even a left-leaning state like Washington is upset by this last-minute "not in my backyard" maneuver. The Evergreen State has been counting on the new repository to accept its 53 million gallons of high-level radioactive waste now stored at the Department of Energy's 586-square-mile Hanford facility in the southeastern corner of the state. That was the reason behind Uncle Sam's spending \$12 billion to construct a vitrification plant at Hanford, which will convert radioactive sludge into glass logs specifically designed to fit into Yucca Mountain's storage vaults. If the repository is abandoned, Washington state contends, the expensive plant would be for naught and the Hanford site would be back to square one with no permanent nuclear storage solution.

President Obama fulfilled a campaign promise to his radical supporters by zeroing out funding for Yucca Mountain in his fiscal 2011 budget last year. Then his energy secretary, Steven Chu, tasked nuclear energy backers with finding a different disposal solution. A Chu-appointed blue-ribbon panel is halfway through a two-year search for an alternative, but it is unlikely to yield results because the findings must pass muster with an anti-nuke left.

The O Force is pursuing an unrealistic energy policy that is free of nuclear power and anything that emits carbon dioxide. Hampering domestic nuclear power by exacerbating the spent-fuel dilemma and oil production by bans on drilling, the administration is counting on utopian energy sources that stop working when the day is calm or night arrives. The thought of wind- and solar-powering the future may fuel the dreams of greens – and fill the pocket of Mr. Obama's friends – but neither can actually power a modern society.

Congress enacted a law that spent billions to build the Yucca Mountain project. The president cannot, on his own, ignore that statute. In light of Japan's recent tragedy, lawmakers ought to persuade the administration to reconsider its position on nuclear waste disposal.

Appeals Court To Hear Yucca Arguments (AUGC)

By Rob Pavey

Augusta Chronicle, March 22, 2011

Oral arguments in a lawsuit aimed at forcing the government to complete the Yucca Mountain nuclear waste repository will be heard today in the Washington, D.C., Circuit Court of Appeals.

"In this case, existing law is very clear that Congress has mandated that the nation's high level nuclear waste shall be stored at the Yucca Mountain facility in Nevada," said communications director Mark Plowden, of the South Carolina Attorney General's Office. "All of the states are in agreement, with the exception of Nevada."

The Yucca Mountain project near Las Vegas was being designed to accommodate 70,000 tons of waste from the nation's 104 commercial reactors -- including those at Plant Vogtle in Georgia -- which are generating about 2,000 tons of spent fuel each year. It was also to be the disposal site for radioactive material from 121 temporary sites, including Savannah River Site.

The project was halted more than a year ago when US Energy Secretary Steven Chu announced he would create a panel to explore other options. He established the 15-member Blue Ribbon Commission on America's Nuclear Future to explore safe, effective nuclear waste alternatives.

The Court of Appeals will hear arguments that the law requires the Yucca Mountain facility to be completed and that the administration must follow the dictates of Congress, Plowden said.

South Carolina and Aiken County brought the original jurisdiction petition, as did the state of Washington, and three of its citizens. Ken Woodington is representing South Carolina. Tom Gottshall is representing Aiken.

Getting Rid Of Spent Nuclear Power Fuel (CHIT)

Dennis Byrne

Chicago Tribune, March 22, 2011

So, what are we supposed to do with spent nuclear power fuel? Rocket it into outer space?

Thanks to Sen. Harry Reid, D-Nev., Democratic Presidents Bill Clinton and Barack Obama and anti-nuke champions, tens of thousands of tons of dangerously radioactive fuel rods have been "temporarily" stored for up to 60 years on American nuclear power sites, many in Illinois. Many are stored like those in pools of water that are threatening to go dry at the damaged nuclear reactors in Japan.

Engineers and scientists say the spent fuel could pose a greater danger than a meltdown of the core reactors. Common sense and science dictate that spent fuel should be stored far away from the power plant, someplace permanent that wouldn't magnify the consequences of a catastrophic accident.

Why aren't they? Politics.

Scientific studies concluded that the best burial site is under Yucca Mountain in the Nevada desert. Congress approved and required ComEd and other nuclear power customers to pay into the Nuclear Waste Fund to finance disposal. So far, we have coughed up more than \$35 billion, of which \$11 billion or so has been swallowed up by Yucca Mountain.

The site was to begin accepting the material in 1998, but Clinton and then Obama, caving in to parochial interests and anti-nuke zealots, threw up years of roadblocks. (President George W. Bush supported Yucca Mountain as the nation's first long-term underground site for high-level radioactive waste.) Reid proudly pronounced the project dead last month as Obama zeroed it out in his 2012 budget. The president also formed a blue-ribbon commission to study — again — the best alternative for the nation's nuclear future, including disposal of the waste.

But no more studies are needed. There's a technology, called the Integral Fast Reactor, that could produce abundant, safe, environmentally friendly and less expensive nuclear power. IFR supporters said it would provide an inexhaustible and domestic fuel supply, while solving the spent-fuel problem.

Argonne National Laboratory, whose baby it was, demonstrated at its Idaho reactor development facility that the technology could safely shut down power plants in both the Chernobyl- and Three Mile Island-type accidents.

The key was a new metallic fuel alloy that could be cleaned and used again and again in the reactor. Charles Till, former director of civilian nuclear power development at Argonne, said the technology, using a common metal refining process, would extend fuel supplies more than a hundred-fold, while slashing the volume and lifetime of the radioactive waste. As a bonus, the fuel had no weapons value.

Despite IFR's promise, the newly elected Clinton and his energy secretary, Hazel O'Leary, with the support of Sen. John Kerry, D-Mass., successfully torpedoed the program. Illinois Democrats — the then-Rep. Dick Durbin and Sens. Carol Moseley Braun and Paul Simon — cognizant of IFR's jobs, first supported the project, but later joined other Democrats to cancel funding. They were for it before they were against it.

As if the matter hadn't been studied enough: In 2001 the Department of Energy launched yet another study to evaluate the 19 best reactor designs on 27 different criteria. Guess which was ranked best? The IFR.

Obviously, the IFR would not have solved the spent-fuel problems in the old reactors revealed by Japan's troubles. So, back to the original question: What do we do with the spent fuel? In the face of the gross politicization of the project and three wasted decades, the Nuclear Energy Institute, an industry group, proposed the creation of a self-sustaining, quasi-government corporation to administer the fund and manage the program. And 64 House Republicans have endorsed legislation that would, while re-energizing nuclear construction, reopen the Yucca Mountain option.

Exelon Corp., which operates nuclear reactors here and elsewhere, says that it can safely shut down its reactors in emergencies, and that its sites have sufficient "portable, high-capacity pumps to ensure the pools remain filled" with water to keep the rods cool. The anti-nuke crowd obviously doesn't agree, having challenged in court a recent Nuclear Regulatory Commission finding that, in effect, concluded that on-site storage is safe, for now.

We can't go back more than a half-century to pretend that nuclear power plants weren't built. Even though the anti-nuke coalition of Democrats, liberals and environmentalists seems to think so. If they weren't living in such a dream world, maybe they would have come up with a better solution.

Dennis Byrne, a Chicago-area writer, blogs at the Barbershop at ChicagoNow.

Radiation Worrying You? Take A Vitamin (DISC)

By Irene Klotz

Discovery Channel, March 22, 2011

To mitigate the effects of radiation on astronauts, doctors advise a simple measure: Take a vitamin pill.

Along with the anti-radiation drug potassium iodide, scientists recommend a vitamin pill to plug any nutritional deficiencies in the Recommended Dietary Allowance, a standard established by the US National Academy Sciences in 1941.

"There are ways to greatly modify the radiation response," Ann Kennedy, head of the NASA-backed National Space Biomedical Research Institute's Radiation Effects Team, told Discovery News.

"(Vitamin) deficiencies appear to be extremely important in determining radiation effects and basically determining the incidences of many, many, many chronic diseases, which would include cancer and cataracts," said Kennedy, a radiation oncology professor at the University of Pennsylvania School of Medicine.

"It used to be viewed by the AMA (American Medical Association) that a good diet containing all the usual levels of RDAs of things was enough and you really didn't need a vitamin pill," she added. "Well, they've basically reversed themselves over the past several years and are making the statement that every American should be taking a daily vitamin pill for the prevention of chronic diseases – and that includes cancer."

"I've certainly recommended that for people on the space station, as well as anyone else at NASA that's flying and has a very high occupational radiation exposure and I would certainly recommend that for all those in Japan exposed to higher than normal doses of radiation," she said. "I think it's just as important for them to be getting a vitamin tablet every day as it is to be taking potassium iodide."

If the radiation exposure levels of workers battling Japan's crippled nuclear reactors are correct, the amount rivals what astronauts traveling beyond the protective bubble of Earth's magnetic field would receive, though the types of radiation are different.

"Workers now at the plant – (who) are apparently receiving high doses of radiation and they are not very well protected -- could be in a similar range (of exposure) to those that an astronaut will encounter during a solar particle event (solar storm)," said Marcelo Vazquez, who previously oversaw research at the NASA Space Radiation Laboratory at Brookhaven.

"The quality of radiation is quite different," Vazquez, now an independent consultant, told Discovery News. "But those workers are apparently close to suffering acute radiation effects."

With the long-term goal of sending humans beyond the space station, which orbits about 220 miles above the planet, NASA has been working on understanding how radiation affects the human body and what can be done to prevent, restrict and reverse its damage. Potential drugs and protocols, including extracts of blueberries and strawberries, are being studied.

"Anything that can be learned from the research can be applicable to Earth conditions, like what's actually happening in Japan right now," Vazquez said.

10 Things You Didn't Know About The Nuclear Regulatory Commission (USNEWS)

By Caitlin Huey

US News and World Report, March 22, 2011

1. The Nuclear Regulatory Commission was established by the Energy Reorganization Act of 1974. The commission absorbed the regulatory powers of what had been the unsuccessful and highly criticized Atomic Energy Commission.

2. The NRC began operation on Jan. 19, 1975.

3. The commission is designed to be an independent regulator of nuclear material and nuclear power used commercially.

4. On March 28, 1979, an incident at the Three Mile Island power plant in Pennsylvania caused about half of the reactor core in one unit to melt. It was deemed the worst nuclear power accident in the United States.

5. The NRC is made up of five commissioners, nominated by the president and confirmed by the Senate to serve staggered five-year terms. No more than three commissioners can be from the same political party.

6. The president selects one commissioner to serve as chairman and official spokesperson. The current chairman is Gregory Jaczko.

7. The NRC has inspectors assigned to 65 nuclear power plant sites and three fuel facilities.

8. The NRC's budget for the 2010 fiscal year was \$1.07 billion, over three quarters of which was spent to ensure the safety of nuclear reactors.

9. The NRC does not have the authority to regulate nuclear weapons or lobby for nuclear power.

10. In March 2011, after a tsunami triggered nuclear power plant explosions in Japan, the NRC dispatched experts to provide advice and assistance in the effort to shut down the reactors. The agency is also monitoring events from its headquarters.

INTERNATIONAL NUCLEAR NEWS:

Japan's Catastrophe Resonates At Economic, Regulatory And Personal Levels (WP)

By David Nakamura And Joel Achenbach

Washington Post, March 22, 2011

TOKYO — Japan's catastrophe is resonating around the planet.

As technicians continued to struggle Monday to control a smoke-belching nuclear power plant in Japan, workers at a General Motors engine-manufacturing facility in Buffalo, N.Y., learned that they would be laid off temporarily as the shortage of Japanese-made parts roils the US auto industry.

In Rockville, the US Nuclear Regulatory Commission opened hearings on the safety of the country's 104 nuclear reactors, many of them long in the tooth and now undergoing a critical reexamination.

And in Richmond, a family mourned. The US Embassy in Japan informed the parents of Taylor Anderson, a 24-year-old American who had been teaching at a school in Japan, that her body had been identified in tsunami-battered Miyagi prefecture. Anderson reportedly helped parents pick up their children after the earthquake before she rode her bicycle home.

"Fittingly, she was last seen helping parents safely reunite with their children following the earthquake, an act which illustrates her dedication to her students and to the Japanese people she served," Virginia Gov. Robert F. McDonnell (R) said.

Japan, the world's third-largest economy, will face five years of rebuilding from the disaster, which could cost the nation up to \$235 billion, according to the World Bank. By comparison, Hurricane Katrina caused \$81.2 billion in damage in 2005, according to a widely cited study by the National Hurricane Center. Last year, the costs of natural disasters soared to a worldwide total of \$109 billion, three times the total in 2009, according to the United Nations.

What makes Japan's crisis so anguishing is the nuclear emergency that drags on day after day despite the efforts of hundreds of workers who are putting themselves in the line of atomic fire at the quake-crippled Fukushima Daiichi power plant. The situation there continues to be two steps forward and one step back.

Emergency workers lost precious hours Monday in their ongoing battle to get the six-reactor complex under control when smoke billowed from two of the reactor units. The first cloud was spotted just before 4 p.m. coming out of the building that houses the unit 3 reactor. It tapered off after two hours. But then another cloud rose 20 minutes later near the unit 2 reactor.

No one was hurt, and the incidents were not as alarming as three previous explosions that damaged buildings housing reactors. But radiation levels spiked briefly, and the Tokyo Electric Power Co. (Tepco) chose to evacuate about 700 workers.

"If we find the levels of radioactivity go down, we'll go back to work," Hidehiko Nishiyama, deputy director general of Japan's Nuclear and Industrial Safety Agency, said at a news conference Monday night at the prime minister's office in Tokyo.

Tepco managed to restore electricity from the power grid to the unit 2 reactor, though it did not activate the damaged cooling systems and is taking measured steps to avoid making the situation worse.

The nuclear drama has drawn the attention of regulators around the world. At the Rockville hearing Monday, William Borchardt, the NRC's executive director for operations, said the situation in Japan appeared to be stabilizing.

"The fact that off-site power is close to being available for use of plant equipment is perhaps the first optimistic sign that things could be turning around," Borchardt said. "I would say optimistically things appear to be on the verge of stabilizing."

Nothing that regulators have learned about the Japanese catastrophe indicated that any changes were warranted at US nuclear plants, Borchardt said.

"We have found no reason to take any immediate regulatory action," he said.

The commission will vote on a plan to conduct a 90-day study of the implications of the Japanese situation for the United States.

"We have a responsibility to the American people to undertake a systematic and methodical review of the safety of our own domestic nuclear facilities in light of the natural disaster and the resulting nuclear emergency in Japan," said NRC Chairman Gregory B. Jaczko.

So far, 8,649 people have died and 13,262 are missing since the 9.0-magnitude quake struck off the coast near Sendai, Japan's National Police Agency said. Nearly 350,000 others have been placed in shelters across the region and as far away as Tokyo.

(PHOTOS: Massive rescue, cleanup efforts underway in Japan)

Martin Faller, head of the East Asia delegation of the International Red Cross, said Monday that fuel is scarce and many people are suffering in the cold weather. Food has become more plentiful, but many elderly people are running low on medicine.

"It was really cold in the operation shelters, logistics had broken down, fuel and kerosene were difficult to get," Faller said in an interview.

Government authorities said they have banned the sale of raw milk and spinach from several prefectures after they were found to contain excessive levels of radiation. The officials said the amounts still did not pose a threat to people's health if consumed. Government scientists are now examining fish and shellfish, said Yoshifumi Kaji, director of the inspection and safety division of the Ministry of Health, Labor and Welfare.

The ministry called on local governments Monday to advise residents to stop giving babies water in forms such as baby formula if radioactive iodine is found at elevated levels in drinking water, the Kyodo news service reported.

"Babies can easily absorb radioactive iodine in their thyroid glands," the agency quoted a ministry official as saying.

Greater amounts of radioactive iodine and cesium were found in rain, dust and particles in the air in some areas over a 24-hour period starting Sunday morning because of rainfall, the agency reported.

New Repairs Delay Work At Nuclear Plant In Japan (NYT)

By Ken Belson, Hiroko Tabuchi And David Jolly

New York Times, March 22, 2011

TOKYO — Efforts to stabilize the crippled nuclear power plant in Fukushima stalled on Monday when engineers found that crucial machinery at one reactor required repair, a process that will take two to three days, government officials said.

A team of workers trying to repair another reactor, No. 3, was evacuated in the afternoon after gray smoke rose from it, said Tetsuro Fukuyama, the deputy chief cabinet secretary of the Japanese government. But no explosion was heard and the emission ended by 6 p.m., NHK, the national broadcaster, said.

Separately, NHK cited the Japanese Nuclear and Industrial Safety Agency as saying that white smoke was coming from the building housing Reactor No. 2, where repairs to machinery were needed. Mr. Fukuyama said significantly higher radiation had not been detected around the two reactors.

An official at the United States Nuclear Regulatory Commission said on Monday that Reactors No. 1 and No. 2 were both too damaged for cooling systems to restart immediately, even when electricity was restored. But the official, William Borchardt, also said that the situation at the plant appeared to be "on the verge of stabilizing." The N.R.C. is advising the United States Embassy, giving assistance to the Japanese and gathering information to benefit American reactor safety.

The State Department, meanwhile, said it would offer potassium iodide to its staff members and dependents in the Tokyo region and to the north on Honshu, Japan's main island and the site of the troubled power station, as a precaution against a possible radiation release. In a travel warning posted online, the State Department advised against taking the chemical compound "at this time" and urged consultation with the United States government before consuming it.

Potassium iodide can help prevent thyroid cancer by reducing the chance that radioactive iodine will be absorbed by the thyroid gland.

Hundreds of employees of the Tokyo Electric Power Company, which owns the disabled Fukushima Daiichi Nuclear Power Station, worked through the weekend to connect a mile-long high-voltage transmission line to the No. 2 unit in hopes of restarting a cooling system that would help bring down the temperature in the reactor and spent fuel pool.

After connecting the transmission line on Sunday, engineers found on Monday that they still did not have enough power to fully run the systems that control the temperature and pressure in the building that houses the reactor, officials from the Japanese nuclear safety agency said.

Engineers were also trying to repair the ventilation system in the control room used to monitor conditions in the No. 1 and No. 2 units. When that work is completed, the power company can begin cleansing the air in the control room so workers can eventually re-enter and begin using equipment inside to monitor conditions in the two reactor units.

Workers at the plant were also trying to connect a separate power cable to Reactor No. 4.

Firefighters from Tokyo doused Reactor No. 3 overnight, and fire trucks from the Japan Self-Defense Forces and the American Army spent two hours on Monday morning spraying water on Reactor No. 4. There are six reactors at the plant; Nos. 4, 5 and 6 were offline when the earthquake and tsunami hit, but there are spent fuel rods atop them and the other three.

The Japanese nuclear safety agency said that some of the water used to douse the damaged reactors had reached the ocean nearby, and that officials were investigating radiation levels in the water. Trace amounts of radioactive material were also reported to have been found on Hokkaido, Japan's northernmost island.

Separately, residents of Iitate, a village about 30 miles from the Fukushima Daiichi plant, were ordered not to drink tap water after high levels of radioactive elements were detected in the water supply, said Takashi Hashiguchi, a Health Ministry official. Residents were told that they could still use tap water for other tasks, like washing their hands or taking a bath, he said.

The order came a day after the government barred all shipments of milk from Fukushima Prefecture and shipments of spinach from Ibaraki Prefecture after finding new cases of above-normal levels of radioactive elements in milk and several crops.

Abnormal levels were also found in spinach from Tochigi and Gunma Prefectures to the west, in canola from Gunma Prefecture and in chrysanthemum greens from Chiba Prefecture, south of Ibaraki.

A spokesman for the World Health Organization said on Monday that the discovery of radiation in food was a more serious problem than the organization first expected, Reuters reported. Peter Cordingley, a Manila-based spokesman for the organization, said there was no evidence that contaminated food from Fukushima Prefecture had reached the export market.

But Mr. Cordingley added that "it's a lot more serious than anybody thought in the early days when we thought that this kind of problem can be limited to 20 to 30 kilometers" from the power plant, according to Reuters.

In Vienna on Monday the United Nations atomic energy chief said the nuclear crisis in Japan remained "very serious."

In a statement, Yukiya Amano, director general of the International Atomic Energy Agency, said he believed "this crisis will be effectively overcome." He also said that "the agency's role in nuclear safety may need to be re-examined, along with the role of our safety standards" and that "it is already clear that arrangements for putting international nuclear experts in touch with each other quickly during a crisis need to be improved."

The food contamination and delays in repair work at the Fukushima plant are two of the challenges facing Japan since a 9.0-magnitude earthquake and subsequent tsunami struck its northeast coast on March 11. Rescue teams on Monday were still searching through communities devastated by the tsunami.

NHK said Monday that the official death toll had been raised to more than 8,600. But the final toll is expected to reach nearly 20,000. On Sunday police officials in Miyagi, the prefecture hit hardest by the tsunami, said they expected the toll there alone to exceed 15,000.

More than 13,000 people are listed as missing.

The World Bank, meanwhile, citing private and Japanese government estimates, said that the cost of the disaster could range from \$122 billion to \$235 billion, or 2.5 percent to 4 percent of gross domestic product, and that it would hurt Japan's growth at least through midyear.

Smoke Plumes Set Back Japan's Efforts To Contain Nuclear Crisis (LAT)

The evacuation of repair crews at the damaged Fukushima plant stalls efforts to restore cooling systems. Four prefectures are ordered to halt milk and spinach and other vegetable shipments after radiation is detected.

By Don Lee, Victoria Kim And John M. Glionna, Los Angeles Times, March 22, 2011

Los Angeles Times, March 22, 2011

Japan's battle to control the damaged nuclear power plant in Fukushima suffered a setback Monday after plumes of smoke rising from two of the six reactor buildings forced an evacuation of repair crews and stalled operations to restore vital cooling systems.

It was unclear early Tuesday what had produced the smoke, which came from the structures housing reactors No. 2 and 3. But some Japanese scientists said the problems didn't appear to signal a deteriorating situation at Fukushima, where workers had been making progress in the painstaking work to contain the nuclear crisis.

Still, the unexplained black and gray plume, and a temporary increase in radiation levels around the plant on Monday, underscored the still precarious scene at the Fukushima Daiichi nuclear facility, where the March 11 Tohoku earthquake and tsunami knocked out the plant's outside power and emergency cooling systems, causing a leak of radiation from multiple sources.

The interruption delayed by a day efforts to restore power to the cooling systems at the plant. The smoke also caused fire officials to halt the spraying of water onto the reactors.

The snag came on a day when the executive director of the US Nuclear Regulatory Commission, Bill Borchardt, said that the agency's staff in Japan reported that the three reactors probably had suffered core damage but did not appear to be leaking significant amounts of radiation.

"I say optimistically that things appear to be on the verge of stabilizing," Borchardt said.

In Japan and abroad, however, concerns over radiation fallout grew. On Monday, Japanese officials said they detected higher than normal radiation levels in samples of seawater around the power complex. And residents of at least one village near the nuclear plant were ordered not to drink tap water.

Japanese authorities Monday also ordered farmers in Fukushima prefecture to halt shipments of milk. And three other nearby prefectures, along with Fukushima, were told to stop shipping spinach and some other vegetables after traces of the radioactive isotopes Iodine 131 and Cesium 137 were found in batches from regions surrounding the plant.

World health officials warned of potential dangers posed by the tainted food. In a sign of the potential problem for Japan's food exports and international image, one Japanese restaurant in Taiwan was reportedly providing radiation gauges with its meals.

World Health Organization officials advised people living near the plant who may have consumed tainted produce or animal products to seek medical attention.

Neighboring nations have increased scrutiny of produce coming from Japan. The governments of China, South Korea and the Philippines have ordered screening of imports from Japan for radiation contamination.

Many Japanese in the tsunami zone, meanwhile, were still experiencing acute shortages of food and gasoline, which caused long lines and shorter tempers.

Many restaurants in the northeastern portion of the country were printing abbreviated menus of five or six dishes. Convenience stores were running out of food and at several locations lines stretched around the block with people seeking such staples as water and rice.

But perhaps the lingering gasoline shortage presented the toughest challenge on Day 10 of the multi-fronted disaster, a situation that many older residents said harked back to the days of deprivation after World War II.

Most gas stations around the region remained closed. Those still open drew lines that left people waiting 12 hours or more, and then only to fill a portion of their tanks.

In the city of Senmaya, about 200 miles north of Tokyo, Sumie Sato and her husband, Naohiro, both 26, slept in their subcompact overnight to receive about five gallons of precious gasoline.

"We have a 2-month-old son at home, so we can't take any chances," said Sumie. "My son has been sick, so if he gets really bad we'll need gas to take him to the hospital."

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Lee reported from Tokyo and Kim from Los Angeles. Glionna reported from Senmaya. Times staff writer Thomas H. Maugh II in Los Angeles contributed to this report.

Kan Sees Progress At Fukushima Plant As Smoke At Reactors Hampers Work (BLOOM)

By Yuji Okada And Tsuyoshi Inajima

Bloomberg News, March 22, 2011

Japanese Prime Minister Naoto Kan said he can see "light at the end of the tunnel" even as smoke at two reactors hampered efforts to restore cooling systems at the troubled Fukushima Daiichi nuclear plant.

Tokyo Electric Power Co. evacuated engineers and halted work after smoke was seen billowing from the No. 3 unit, Hitoshi Emukai, a Tokyo-based spokesman at the utility, said yesterday. White smoke seen later at the No. 2 reactor is likely steam, said Naoki Tsunoda, another company spokesman.

Kan's optimistic statements are the strongest yet from a Japanese official amid the world's worst nuclear crisis in 25 years. The battle to prevent a meltdown entered its 12th day as reports of radiation contamination at sea and on land multiplied. Cooler temperatures in pools holding spent fuel rods are the result of thousands of tons of seawater sprayed over the reactors since the March 11 earthquake and tsunami damaged the cooling systems.

"While we haven't reached the point where we can say we've gotten out of this crisis situation, it can be said that we can see the light at the end of the tunnel," Kan said at a meeting of his crisis response team in Tokyo.

Firefighters have sprayed seawater on the reactor buildings from fire engines in attempts to refill storage pools and prevent fuel rods from overheating and releasing more radiation.

Regulators in Japan and the US said not covering the hot plutonium rods could cause them to catch fire and release radioactive pollution if exposed to air.

Nikkei 225 Stock Average futures expiring in June jumped 2.9 percent to 9,440 in Singapore after Tokyo Electric said it connected a power cable from reactor 3 to 4, and Kan said progress was being made restoring power to units 1 and 2. Japan's markets were closed for a public holiday yesterday.

The death toll from the nation's worst postwar disaster rose to 8,805 as of 9 p.m. local time yesterday with 12,654 people missing, according to the National Police Agency in Tokyo. The earthquake and ensuing tsunami devastated the country's northern coastline and forced hundreds of thousands to evacuate.

"We are at the beginning of the post-accident phase," Andre-Claude Lacoste, head of the Paris-based Autorite de Surete Nucleaire, a watchdog group, said at a press conference in Paris yesterday. "Japan will have to deal with the consequences of this accident for decades."

The Japanese government is risking a food scare by failing to clarify where produce is contaminated and stopping some shipments, said Toshihiko Baba, a spokesman for the Central Union of Agricultural Co-operatives in Japan, which represents more than 4.8 million farmers. Radiation levels found in food so far aren't harmful, Chief Cabinet Secretary Yukio Edano said.

Japan's nuclear safety agency said the nation will limit distribution of spinach and milk after samples from the area near the plant 135 miles (220 kilometers) north of Tokyo were found to have higher-than-normal radiation levels. Spinach sampled at Hitachi, 97 kilometers south of the plant, contained 27 times the government limits for Iodine-131, according to the health ministry. That spinach won't enter the food chain.

"Food-borne radiation will last longer than airborne radiation," Gregory Hartl, a spokesman for the World Health Organization in Geneva, said in an interview. "Even smaller amounts of radiation in food could potentially be more dangerous because you ingest it."

Japan's limits are based on assumptions about how much contaminated food a person may eat, Edwin Lyman, a specialist on nuclear materials for the Union of Concerned Scientists in Washington, said in a press call.

"It will be a dilemma for a lot of consumers in Japan," Lyman said. "People are going to have to understand the basis for those limits."

Japanese officials will have to perform triage on farmland — closing some areas entirely, monitoring some for radiation and labeling some as safe, said Kenneth Bergeron, a former nuclear scientist at Sandia National Laboratory in Albuquerque, New Mexico.

"Japan is going to have to put in place a very extensive monitoring system to make sure that every batch of produce that might come out of this area is monitored," Bergeron said.

Asian countries are screening Japanese imports, and Taiwan yesterday detected radiation on vegetables that was within acceptable limits. Stores and restaurants across Asia dropped Japanese food from shelves and menus.

Tokyo Electric reported radioactivity levels today above allowable limits in seawater sampled near the plant at 2:30 p.m. local time, Kyodo News reported. Rain, or the seawater that crews are using to cool the plant, may have washed contaminants into the sea, Kyodo News said.

Fuel shipments at Sendai Shiogama Port have resumed and roads to the worst-hit areas reopened, adding to signs the crisis may be passing its peak.

Radiation containment domes at the reactors are intact and the situation at the plant "is on the verge of stabilizing," the US Nuclear Regulatory Commission's Bill Borchardt said.

"The fact that offsite power is close to being available for use at plant equipment is perhaps the first optimistic sign that things could be turning around," Borchardt, executive director for operations, said at a meeting at the agency's headquarters in Rockville, Maryland.

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Radiation Over US Is Harmless, Officials Say (NYT)

By William J. Broad

New York Times, March 22, 2011

Harmless traces of radiation from the stricken nuclear complex in Japan have been detected wafting over the East Coast of the United States, European officials said Monday.

Since last week, the officials have tracked the radioactive plume as it has drifted eastward on prevailing winds from Japan — first to the West Coast and now over the East Coast and the Atlantic, moving toward Europe.

Health experts said that the plume's radiation had been diluted enormously in its journey of thousands of miles and that — at least for now, with concentrations so low — its presence will have no health consequences in the United States. In a similar way, faint radiation from the Chernobyl disaster spread around the globe and reached the West Coast in 10 days, its levels detectable but minuscule.

Atomic and atmospheric specialists expect that, in time, the extremely diffuse Japanese plume will spread so that it extends over most of the planet's northern regions.

The global network of the Comprehensive Test Ban Treaty Organization, an arm of the United Nations in Vienna, has detected the movements of the plume. The organization's mandate is to monitor the global ban on the testing of nuclear arms, and it has more than 60 stations that sniff the air for radiation spikes.

The group has declined to make the recent findings public, but it shares its information with 120 member states, some of which have divulged the status of the plume's movements.

On Friday, European officials said that network sensors in Sacramento had detected the radioactive plume, picking up traces of iodine 131 and cesium 137 — highly dangerous byproducts of reactor operation that in large amounts can cause cancer. The measured levels were judged to be many millions of times lower than concentrations that would pose a danger to human health.

Late Friday, the Department of Energy confirmed the European statements about the arrival of the radioactive plume in the continental United States, saying its "minuscule quantities" of radiation posed no health hazard.

On Monday, European officials said the plume had reached the East Coast after drifting over North America. One station that detected the fresh radioactivity is in Charlottesville, Va., officials said.

Although the legal mandate of the treaty organization is to scan the globe for inconspicuous signs of clandestine bomb blasts — not the repercussions of reactor accidents — its officials recently decided to start sharing their data more widely in an effort to help international authorities who are struggling with the Japanese crisis.

In a statement on Friday, the Vienna group said it had begun sharing the monitoring information with the International Atomic Energy Agency and the World Health Organization. The group explained that it was "responding to respective requests" from the two organizations that it received Thursday for aid in "assessing the situation."

Japan's Nuclear Crisis Causes Run On Radiation Detectors (NYT)

By Verne G. Kopytoff

New York Times, March 22, 2011

SAN FRANCISCO — Since Japan's nuclear crisis started, Tim Flanegin's phone has barely stopped ringing with orders for Geiger counters, the radiation detectors, to the point that he has no more in stock.

He posted a message on his site, Geigercounters.com, to warn new customers and to reassure those who had already placed orders that they would be filled "in the coming days, weeks and months."

Last Thursday, after receiving hundreds of orders, "I had to shut it down almost completely," Mr. Flanegin said from his home in Prescott, Ariz. Compared with the typical 20 orders a week, he said, "the demand has been so overwhelming."

With small amounts of radiation from Japan's damaged reactors wafting across the Pacific Ocean, relief crews, businesses and ordinary consumers have bought nearly every Geiger counter available from the few retailers that sell them. The run is a grim reminder of the scope of the disaster and the widespread concern about radiation contamination, including in the United States.

Many people buying the devices say they are worried about their food becoming contaminated. One customer, Mr. Flanegin said, was a theme park in Japan that wanted to check its food supplies as a precaution for its visitors.

Radiation detectors come as hand-held devices, wrist watches and pager-size gadgets that hang from the belt. Their cost varies from \$150 for a self-assembled kit to \$4,000 for a more sophisticated version that stores radiation readings along with the GPS coordinates of where those readings were taken.

Technically, Geiger counters are just one type of radiation detector. But many people use the term to describe all radiation detection equipment.

Law enforcement, fire departments, military, hospitals, scientific laboratories, schools and prospectors are the typical customers. Federal government agencies seem to be well enough stocked that they are not scrambling to buy more, according to the sellers interviewed.

Usually, the general public, other than a small group of hobbyists, has little interest in radiation.

But that changed after a devastating earthquake and tsunami set off Japan's nuclear troubles. Demand for radiation detectors, along with potassium iodide pills, which can help prevent radiation-induced thyroid cancer, quickly outstripped supplies and the limited capacity to produce more.

Skepticism that the government will be forthcoming about radiation levels is driving some of the sales, said John Iovine, president of Images SI, a company in Staten Island that makes and sells Geiger counters and other scientific instruments.

"I never really felt it until people started calling up," he said. "They want their own Geiger counter to check up." Radiation levels in the United States remain within the normal range, according to the Environmental Protection Agency, which has a network of monitors across the country. Updates are available on the E.P.A.'s Web site.

During a typical week, Mr. Iovine says, he may get an order for 20 Geiger counters from a local government followed by several weeks without any additional sales. But in the week after the Japan earthquake, he said he received close to 200 orders and was now sold out. Customers are now warned that it will take six to eight weeks to fill any orders.

Still, buying a radiation detector is just the first step, Mr. Iovine said. Owners of the devices need to discern between dangerous radiation levels and a normal background reading.

"To use it is very simple," Mr. Iovine said. "To interpret the results gets a little more difficult."

Naturally occurring radiation varies depending on factors like local geology and altitude. People are exposed to additional radiation when they get an X-ray or fly in an airplane.

Robert Corsetti, director of sales and marketing for Berkeley Nucleonics, which makes and sells industrial-grade radiation detection equipment, said that calls to his company, which is based in San Rafael, Calif., increased up to 15 times the normal level after the problems started in Japan. In some cases, people are simply calling to ask if they are at risk, and not to buy something.

"We send out PowerPoints that dispel rumors," Mr. Corsetti said. "I send the e-mail 20 times a day." In one case, he said, an airline pilot who regularly flies to Tokyo wanted a detector to determine if he was being exposed to more radiation than usual. NBC News crew members in Japan are using radiation detectors from Berkeley Nucleonics that they can wear on their belts, much like beepers. The devices sound an alarm when they detect excessive radiation and when the dose exceeds a specified level over time.

In addition to the detectors, NBC News personnel are equipped with protective masks and suits, along with access to potassium iodide pills.

Mr. Flanegin, the owner of Geigercounters.com, expressed sympathies for the Japanese people, even if their dire situation had lifted his sales. All the scrambling to meet customer orders, he said, "is nothing compared with what the Japanese people are going through."

Recovery Efforts Continue At Japan's Fukushima Nuclear Plant (PLATTS)

By Steven Dolley, Ann MacLachlan

Platts, March 22, 2011

Pressure levels rose then stabilized Sunday in one of the crippled reactors at the Fukushima I nuclear power plant in Japan, government and industry officials said.

Plans being considered earlier Sunday to vent radioactive steam from the reactor to reduce pressure were deferred and workers will continue to monitor reactor pressure, Tokyo Electric Power Co. said in a statement Sunday afternoon local time.

Efforts continue to restore outside electric power to instruments and safety systems at the site's six reactors and spent fuel pools. The Japan Atomic Industrial Forum, the nation's nuclear industry group, said in an update that as of 10 pm Sunday local time (1300 GMT), an external power cable had been connected to the "distribution switchboards" at units 1 and 2. Efforts were continuing to restore external power to units 3 and 4. Fuel is still "partially or fully exposed" in units 1, 2 and 3, JAIF said, creating a risk of fuel damage, generation of explosive hydrogen gas and possible core melting.

Reactor pressure levels are "stable" at units 1 and 3, but is "unknown" for unit 2, JAIF said.

Injection of seawater to cool reactor cores continues at units 1, 2 and 3, Tepco said.

Cooling capability was restored Sunday to spent fuel pools at units 5 and 6, where temperatures had been rising, JAIF said. Emergency workers continued efforts Sunday to spray water into the pools at units 3 and 4 and that had some effect, it said without providing details. Seawater "injection" continues at the unit 2 pool and is being "considered" for the unit 1 pool, the group said.

Chief Cabinet Secretary Yukio Edano suggested at a briefing Sunday local time that the Fukushima reactors will never be restored to operation.

"As the government has [nuclear energy] authorities, it's difficult for me to say anything definite before following the appropriate procedures," Edano said according to a report by Australian ABC News.

"Looking at the plant from an objective point of view, I think it's clear in a way if the Fukushima Daiichi plant is in a state of being able to function or not," Edano said. "I hope you can get it from the way I said it."

US Nuclear Regulatory Commission Chairman Gregory Jaczko said in an interview on C-SPAN Sunday that the most urgent priority remains restoring reliable cooling to Fukushima's reactors and spent fuel pools.

He declined to assess the plant's current safety status, saying "it's still a very difficult situation."

Jaczko also declined to comment on a New York Times report Saturday that said Tepco executives may have "wasted precious time in the early hours of the nuclear crisis, either because of complacency or because they did not want to resort to emergency measures that could destroy the valuable plant."

The story quoted Kuni Yogo, formerly an atomic energy policy planner in Japan's Science and Technology Agency, as saying he believed Tepco executives "did not recognize the risks soon enough. They failed to cool the reactors on the day of the earthquake, March 11, and even after a hydrogen explosion the following day, they waited more than four hours to start dousing the reactors with seawater. They did not even try to put water into the spent fuel pools for several days."

Jaczko said only that "we will have an opportunity when the crisis is resolved to go back and see how decisions were made."

The US NRC is conducting short-term and long-term safety reviews to determine what issues the Fukushima accident raises for the US fleet of 104 nuclear power reactors, roughly a fourth of which are similar in design and vintage to the stricken Japanese units. The NRC staff will brief the commission Monday morning on the accident.

Much more detailed information on the events in Japan will be available to inform the long-term NRC safety review, which will take "several months," Jaczko said.

FRENCH REGULATOR SAYS JAPANESE SITUATION STILL 'PRECARIOUS'

The situation at Japan's Fukushima I nuclear power plant "remains serious and precarious," Olivier Gupta, deputy director general of France's nuclear safety authority ASN, told journalists in Paris Sunday morning local time.

Gupta said the most serious short-term danger was at the plant's unit 3 reactor, where Tepco had earlier in the day planned to vent the reactor vessel to relieve mounting pressure without knowing for sure whether the pressure suppression pool at the bottom of the containment was intact.

"If the pool is too damaged, the [radioactive] releases will not be filtered" before attaining the atmosphere, Gupta said. The pool is designed in normal operation to trap radionuclides via a bubbling mechanism before the containment gases are vented. Tepco said that the proposed venting would release radioactive materials totalling [6.5 Exabecquerels], "which surpasses the standard for a serious accident," he said.

France's Institute of Radiological Protection and Nuclear Safety on Thursday estimated that radioactive releases from the Fukushima plant so far were about an order of magnitude lower than that. Most of the releases have been from voluntary venting of the reactors at units 1, 2 and 3 to prevent pressure from building up inside. Up to now, all those releases have been filtered.

Gupta said that although Tepco was doing what it could to restore power and cooling to the stricken reactors and spent fuel pools at Fukushima, "the situation from a technical viewpoint has not changed significantly for several days."

Gupta added that the situation cannot be considered stabilized until Tepco has restored more permanent power supply and more lasting means of cooling the units than those being used now.

EU Fails To Agree On Nuclear Stress-Tests (WSJ)

By Geoffrey T. Smith And Bernd Radowitz

Wall Street Journal, March 22, 2011

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

Japan Extended Reactor's Life, Despite Warning (NYT)

By Hiroko Tabuchi, Norimitsu Onishi And Ken Belson

New York Times, March 22, 2011

TOKYO — Just a month before a powerful earthquake and tsunami crippled the Fukushima Daiichi plant at the center of Japan's nuclear crisis, government regulators approved a 10-year extension for the oldest of the six reactors at the power station despite warnings about its safety.

The regulatory committee reviewing extensions pointed to stress cracks in the backup diesel-powered generators at Reactor No. 1 at the Daiichi plant, according to a summary of its deliberations that was posted on the Web site of Japan's nuclear regulatory agency after each meeting. The cracks made the engines vulnerable to corrosion from seawater and rainwater. The generators are thought to have been knocked out by the tsunami, shutting down the reactor's vital cooling system.

The Tokyo Electric Power Company, which runs the plant, has since struggled to keep the reactor and spent fuel pool from overheating and emitting radioactive materials.

Several weeks after the extension was granted, the company admitted that it had failed to inspect 33 pieces of equipment related to the cooling systems, including water pumps and diesel generators, at the power station's six reactors, according to findings published on the agency's Web site shortly before the earthquake.

Regulators said that “maintenance management was inadequate” and that the “quality of inspection was insufficient.”

Less than two weeks later, the earthquake and tsunami set off the crisis at the power station.

The decision to extend the reactor's life, and the inspection failures at all six reactors, highlight what critics describe as unhealthy ties between power plant operators and the Japanese regulators that oversee them. Expert panels like the one that recommended the extension are drawn mostly from academia to backstop bureaucratic decision-making and rarely challenge the agencies that hire them.

Because public opposition to nuclear power makes it hard to build new power plants, nuclear operators are lobbying to extend their reactors' use beyond the 40-year statutory limit, despite uneven safety records and a history of cover-ups. The government, eager to expand the use of nuclear energy and reduce the reliance on imported fossil fuels, has been largely sympathetic. Such extensions are also part of a global trend in which aging plants have been granted longer lives.

Over the next decade in Japan, 13 more reactors — and the other 5 at the Fukushima Daiichi plant — will also turn 40, raising the prospect of gargantuan replacement costs. That is one reason critics contend that the Nuclear and Industrial Safety Agency's committee in charge of inspecting aging nuclear power plants may play down its own findings.

In approving the extension in early February, regulators told Tokyo Electric to monitor potential damage from radiation to the reactor's pressure vessel, which holds fuel rods; corrosion of the spray heads used to douse the suppression chamber; corrosion of key bolts at the reactor; and conduction problems in a gauge that measures the flow of water into the reactor, according to a report published in early February.

The committee, which convened six times to review findings gathered during inspections of the No. 1 unit at the power station, found that Tokyo Electric had met all required protections from earthquakes. Inspectors, however, had spent just three days inspecting the No. 1 unit, a period that industry experts say was far too brief because assessing the earthquake risk to a nuclear plant is one of the most complex engineering problems in the world.

Despite these doubts, the committee recommended that Tokyo Electric be given permission to run the No. 1 unit, which was built by General Electric and began operating in 1971, for an additional decade. During the approval process, the company claimed that the reactor was capable of running for 60 years.

Mitsuhiro Tanaka, an engineer who worked on the design of the reactors at the Fukushima Daiichi plant, said the reactors there were outdated, particularly their small suppression chambers, which increased the risk that pressure would build up within the reactor, a fault eliminated in newer reactors. Since the tsunami, officials at Fukushima Daiichi have tried to relieve rising pressure inside the reactors, several times resorting to releasing radioactive steam into the atmosphere, a measure that in turn has contributed to the contamination of food and water in the area.

“It was about time the reactor was replaced,” Mr. Tanaka said. “The tsunami would have caused great damage, regardless. But the pipes, the machinery, the computers, the entire reactors — they are just old, and that did not help.” Somewhat younger reactors, Nos. 2, 3, and 4, also suffered extensive damage.

Regulators approved the 10-year extension even though aging reactors at Tokyo Electric, as well as those at other power companies, had suffered a series of problems as far back as a decade ago. Attempts to cover them up and manipulate data, particularly by Tokyo Electric, the country's biggest utility, underscored not only the problems of the nuclear industry but also Japan's weakness in regulating it. The company has admitted wrongdoing.

A Tokyo Electric spokesman, Naoki Tsunoda, said: “We are committed to carrying out proper inspections in the future. We will study why this has happened and endeavor to inform the public.”

In 2000, a whistle-blower at a separate company that was contracted to inspect the reactors told regulators about cracks in the stainless steel shrouds that cover reactor cores at Fukushima's Daiichi plant. But regulators simply told the company to look into the issue, allowing the reactors to keep operating.

Nuclear regulators effectively sat on the information about the cracks in the shrouds, said Eisaku Sato, the governor of Fukushima Prefecture at the time and an opponent of nuclear power. He said the prefecture itself and the communities hosting the nuclear plants did not learn about the cracks until regulators publicized them in 2002, more than two years after the whistle-blower reported the cracks.

In 2003, regulators forced Tokyo Electric to suspend operations at its 10 reactors at two plants in Fukushima and 7 reactors in Niigata Prefecture after whistle-blowers gave information to Fukushima Prefecture showing that the company had falsified inspection records and hid flaws over 16 years to save on repair costs. In the most serious incident, Tokyo Electric hid the large cracks in the shrouds.

“An organization that is inherently untrustworthy is charged with ensuring the safety of Japan's nuclear plants,” said Mr. Sato, governor from 1988 to 2006. “So the problem is not limited to Tokyo Electric, which has a long history of cover-ups, but it's the whole system that is flawed. That's frightening.”

Like many critics of Japan's nuclear industry, Mr. Sato attributed weak oversight to a conflict of interest that he said essentially stripped the Nuclear and Industrial Safety Agency of its effectiveness. The agency, which is supposed to act as a watchdog, is under the Ministry of Economy, Trade and Industry, which has a general policy of encouraging the development of Japan's nuclear industry.

The ministry and the agency, in turn, share cozy ties with Tokyo Electric and other operators — some of which offer lucrative jobs to former ministry officials in a practice known as "amakudari," or descent from heaven.

"They're all birds of a feather," Mr. Sato, 71, said in an interview at his home in Koriyama, in Fukushima Prefecture.

The Japan Nuclear Energy Safety Organization, which is supposed to provide a second layer of scrutiny, is understaffed and largely an advisory group. Masatoshi Toyoda, a former vice president at Tokyo Electric who, among other jobs, ran the company's nuclear safety division, said the organization should be strengthened. The United States had a similar setup until the 1970s, when Congress broke up the old Atomic Energy Commission into the Department of Energy and the Nuclear Regulatory Commission.

"Like the Nuclear Regulatory Commission in the United States, they should have full-time engineers who should check the safety of power plants," Mr. Toyoda said. "I've been telling the government that the system should be changed, but any changes to Japan's nuclear policy take a long time."

Hidehiko Nishiyama, deputy director general of the Nuclear and Industrial Safety Agency, said that "there are no problems with the current safety setup." He added that the extension of the life of Reactor No. 1 "was approved on the understanding that any problems found would be fixed by Tokyo Electric."

But critics say the approval process for extending the lifespan of reactors is fraught with problems. Limited amounts of information are disclosed before approval is granted. The government reviews only reports submitted by utilities, and does not conduct its own tests to determine whether those reports are true, according to Chihiro Kamisawa, a nuclear safety researcher at the Citizens' Nuclear Information Center, Japan's most vocal nuclear watchdog.

"They are stretching the limit," Mr. Kamisawa said.

Japan Damage Cost: \$300 Billion (WSJ)

Among Costliest Events Ever for Insurance Industry; East Asia Export Concerns

By Anita Greil, Shai Oster And Serena Ng

Wall Street Journal, March 22, 2011

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Japan's Leader Tries To Assuage Nuclear Concerns (WT)

WHO, World Bank alarmed

By Christopher Johnson, The Washington Times

Washington Times, March 22, 2011

NARA, Japan | Prime Minister Naoto Kan tried Monday to reassure the world that emergency crews are making progress to prevent a wider nuclear disaster in Japan, as U.N. health officials and the World Bank delivered more bad news for the battered nation.

Japan's National Police Agency raised the death toll Monday to 8,805, with 12,654 missing. The earlier death toll was about 2,000.

After workers over the weekend struggled to rig electrical cables to the six nuclear reactors at the Dai-ichi power plant, Mr. Kan said he saw hope of restoring cooling systems and preventing a meltdown at four of the reactors crippled by the tsunami caused by the massive earthquake 10 days ago.

"While we haven't reached the point where we can say we've gotten out of this crisis situation, it can be said that we can see the light at the end of the tunnel," Mr. Kan said during a crisis meeting at his Tokyo office.

Shortly after the meeting, however, nuclear safety officials reported smoke billowing from two reactors, forcing workers to temporarily halt attempts to restore power. Later in the day, engineers managed to hook up power lines to all six units and started a water pump at one.

The World Health Organization (WHO), meanwhile, warned of contamination in farm products beyond the vicinity of the seaside nuclear reactors in Fukushima province, about 150 miles northeast of Tokyo.

The World Bank added another blow Monday, warning that Japan may need five years to rebuild from the disasters, with between \$122 billion to \$235 billion in damages. That would equal 2.5 percent to 4 percent of the gross domestic product of Japan, the world's third-largest economy.

The bank also predicted that the cost to private insurers will be up to \$33 billion and that the government will spend \$12 billion on reconstruction in the current budget and much more later.

Japanese officials ordered the suspension of shipments of spinach from four provinces that normally provide the greater Tokyo area with much of its fresh produce.

Japan's Ministry of Science said traces of radioactive iodine were found in samples of tap water in nine provinces including Tokyo, Saitama, Chiba and Kanagawa, home to more than 30 million people.

The WHO report suggested that wind and rain has blown radioactive particles to the west and south far beyond Japan's 18-mile danger zone around the power plant.

While Japanese government officials said the low levels of radiation posed no immediate health risks, the WHO said contaminated food may have already made it to markets in Japan. It found no evidence that Japan was deliberately exporting radiated food to countries that have stepped up screening of goods from Japan.

"Quite clearly it's a serious situation," said Peter Cordingley, a regional WHO spokesman. "It's a lot more serious than anybody thought in the early days when we thought that this kind of problem can be limited to 12 to 18 miles. It's safe to suppose that some contaminated produce got out of the contamination zone."

Many consumers in Japan shunned spinach, sold in packages that often do not show the place of origin.

"Please do not overreact, and act calmly," said Chief Cabinet spokesman Yukio Edano. "Even if you eat contaminated vegetables several times, it will not harm your health at all."

Mr. Edano said Fukushima's operator, Tokyo Electric Power Co., will compensate farmers affected by bans on the sale of raw milk, spinach and canola from Fukushima, Ibaraki, Tochigi and Gunma provinces.

Thousands of farmers in those areas, who already have endured fuel shortages and power cuts, worry about potential nuclear fallout in their soil a few weeks ahead of planting season for an array of vegetables supplying about 40 million consumers in the greater Tokyo area.

The Health Ministry also advised a village 20 miles northwest of the plant to avoid drinking tap water because of elevated levels of iodine. Ministry spokesman Takayuki Matsuda said iodine three times the normal level was detected there. However, the event the higher amount in a quart of water equaled only about 1/26th of the level of a normal chest X-ray.

The radiation issues overshadowed progress made in bringing volunteers and supplies to devastated areas of northeastern Japan.

While thousands of evacuees were bused to sports arenas such as the Saitama Super Arena outside Tokyo, many survivors chose to stay closer to their hometowns, despite food and water shortages, in order to search for missing relatives or recover valuables from their destroyed homes.

- This article is based in part on wire service reports.

US Agrees To Help Chile Go Nuclear, Despite Japan Disaster (CSM)

By Steven Bodzin, Correspondent

Christian Science Monitor, March 22, 2011

Among the "urgent events" that President Obama said he discussed Monday with Chilean President Sebastián Piñera was the unfolding nuclear crisis in Japan that began March 11 when a magnitude 9.0 earthquake and resulting tsunami along the northeast coast. Skip to next paragraph

While the crisis only appeared to be mentioned in passing during a press conference in Santiago during Mr. Obama's five-day regional tour, it has set off a firestorm of criticism against Mr. Piñera and caused a major rethink over energy policy here.

Yesterday, some 2,000 people marched through the capital to protest a new US-Chile nuclear power cooperation agreement signed Friday as radiation leaked from Japan's Fukushima nuclear plant. The agreement promises cooperation in operating research reactors, handling civilian nuclear training and safety measures. It seemed a natural extension of Piñera's steady push for nuclear power to ensure electricity for Chile's world-leading copper industry.

But recent events appear to have caused Piñera to pivot.

Like Japan, Chile is seismic – its 9.5-magnitude quake in 1960 was the most powerful of the 20th century. And Chile's risk management culture is not as mature as Japan's. Now, this mineral-rich nation faces an energy dilemma: whether to choose earthquake-prone nuclear power plants or greenhouse gas-emitting coal-fired power plants. Walking the fence

Ditching nuclear power would mark a sharp shift for Chile's government. Piñera said in an energy policy address in November that the country should build small nuclear plants like those found on nuclear submarines – an idea also promoted by the US Commerce Department. And last month, Energy Minister Laurence Golborne visited France and signed a nuclear

cooperation agreement. The signing was announced with a press release, unlike the silence around Friday's closed-doors ceremony.

Then on Friday, Mr. Golborne said on Twitter: "I've been clear. We don't have nuclear plants in Chile, there are no plans to build them, and there's a commitment not to make a decision during this government."

Former President Ricardo Lagos, who supported nuclear power while in office, told local newspaper La Tercera: "Today the conditions don't exist to think about nuclear power. A lot of time will pass before it can be reconsidered." US hunts for nuclear markets

If it doesn't use nuclear energy, then how will Chile power its growing copper extraction industry? Coal.

Chile has already approved almost a dozen new coal-fired power plants to allow its metals industry to grow to meet world demand. The country approved in February a 2,400-megawatt plant for the coast, which if built will be the biggest coal-fired plant in South America.

But there's a heavy price to pay environmentally for that. Growth of coal and diesel-fired electricity to power copper mines and smelters was one of the reasons that copper produced more greenhouse gases per ton in 2008 than in 2004, according to the Chilean Copper Commission.

That, as well as the US's hunt for new markets for its nuclear technology, could keep Chile on a nuclear course.

In a November report, the US General Accounting Office called on the Commerce Department to identify new markets, saying the US has lost much of its share in the global nuclear marketplace.

"US exports of sensitive nuclear material such as natural and enriched uranium remained stable, while the US share of global exports for these materials decreased significantly, from 29 percent to 10 percent, from 1994 through 2008," the agency said.



NUCLEAR REGULATORY COMMISSION NEWS CLIPS

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TODAY'S EDITION

NRC News:

No Urgent Changes Seen For US Nuclear Plants (NYT)	2
Japan Nuclear Crisis After Earthquake Doesn't Warrant US Changes, Official Says (AP)	3
NRC Readies Review Of US Plants (POLITCO)	4
NRC Sees Signs Of Stability In Japan, Plans Review Of US Reactors (GWIRE)	4
US Plans More Nuclear Inspections After Japan Crisis (REU)	5
Nuclear Regulatory Commission To Get Update On Japan Crisis, Begin Review Of U.S Plant Safety (AP)	5
NRC Likely To Approve Study Of Japan Nuclear Incident (CNN)	5
Jaczkowski's Call On Fukushima Radiation Plucks US Regulator From Obscurity (BLOOM)	6
Martha Coakley Asks Feds To Re-examine Nuclear Storage (AP)	8
Operators Of Indian Point Say Changes Are Likely (NYT)	8
US Nuclear Plants Are Safer Than Japan's, But Operational Quality Needs Work (CWIRE)	9
US Reactors Vulnerable In Event Of Japan-scale Crisis (REU)	12
Japan's Nuclear Crisis Reignites Safety Debate (USNEWS)	12
NEWS ANALYSIS: Japan Crisis Puts Global Nuclear Expansion In Doubt (PLATTS)	13
NRC Plans Meetings To Discuss Reactors In N.Y., S.C. (GWIRE)	14
Despite Calls To Slow Down, NRC Grants Vt. Renewal (AP)	15
Vermont Nuke Plant Gets Federal OK For 20-Year Renewal (AP)	16
Sanders Asks Obama For Moratorium On License Renewals For Nuclear Plants (VTD)	16
NRC Issues New License For Yankee (BRATBORO)	17
Vermont Yankee Has 20-year Extension License In Hand (BOS)	17
Entergy's Vermont Nuclear Plant Gets NRC Extension (WSJ) ..	18
NRC Grants Entergy 20-year Renewal For Vermont Yankee Nuclear Power Plant (NOTP)	18
NRC Officially Issues 20-Year License Renewal To Vermont Yankee (VTPR)	19
My Turn: Support Yankee's Scheduled Closure (BURFP)	20
Can Vermont Learn From Maine Yankee's Closing? (WCAXTV) ..	20
Vt. House Minority Leader Voices Concern Over Yankee Closure (WCAX)	21
Pilgrim Nuclear Plant Wants To Cut Training Funds (TAUGAZ) ..	21
New Designs For Nuclear Power Plants Seek To Generate Greater Trust (KCS)	22
Editorial: Keep Nuclear Part Of Energy Future (MHTR)	25
Could It Happen Here? (MORRISDH)	26
Calif. Senators Call On Utilities To Delay Nuclear Plant Relicensing For New Seismic Studies (AP)	27
Senator Asks PG&E To Suspend License Renewal Request For Diablo Canyon Nuclear Plant (Ventura County Star) ..	28
PG&E Blasted For 'Disregard Of Risk' At Nuclear Plant (BAYCIT)	29
NRC Sends Inspectors To Ameren's Callaway Plant (SLPD)	30
NRC Inspectors Look At Lubrication Concern At Missouri Nuclear Plant (AP)	30
STP Expansion Slowed Down In Wake Of Japanese Disaster (SAEN)	30
South Texas Nuclear-power Plant Expansion Project Put On Hold (SABIZ)	31
Arizona Capitol Times » Blog Archive » Arizona Nuclear Power Plant Facing Safety Hearing (AP)	32
Arizona Corporation Commission To Get Status Update On Nuclear Industry (PHOBIZ)	33
Spent Nuclear Fuel Storage Comes Under Scrutiny (CHIT)	33
Local And State News From Virginia Business (VABIZ)	34
More On Nuke Plants' Earthquake Risk (FFLS)	35
Japanese Reactors Are Similar Yet Different From Those In Virginia (NWPRTNWZ)	36
Liquor Lobby Tools And Spent Fuel Pools (Journal Inquirer)	36
Constellation: Lessons From Japan Will Make A Safe US Nuclear Industry Safer (BSUN)	37
Environmental Groups Say Cuomo Administration Should Address Safety Concerns At Upstate Nuclear Facilities (2011-03-21) (WRVO)	38
Exelon Faces Regulatory Fallout After Japanese Nuclear Disaster (CRCHIBIZ)	39
Florida Utility To Buy Into Future S.C. Nuclear Plants (MYRTLE) ..	40
NextEra CEO Says Nuclear Plants Well-prepared For Disasters (PALMBEACHP)	40
Nine Mile Point Unit I Taken Offline For Scheduled Refueling (SPS)	41

UPDATE 1-Constellation Shuts NY Nine Mile 1 Reactor To Refuel (REU)	41	Kan Sees Progress At Fukushima Plant As Smoke At Reactors Hampers Work (BLOOM)	52
Judge Dismisses Oswego School District Challenge Of Nuke Plant Tax Agreement (SPS)	41	Radiation Over US Is Harmless, Officials Say (NYT)	53
Lawsuit Dismissed Against Constellation Energy Group (YNN)	42	Japan's Nuclear Crisis Causes Run On Radiation Detectors (NYT)	54
Conn. Lawmakers Consider Tax On Electricity Generators As Critics Cite Rising Cost Of Power (AP)	42	Recovery Efforts Continue At Japan's Fukushima Nuclear Plant (PLATTS)	55
Several Obama Cabinet Secretaries Also In Latin America (WP)	43	EU Fails To Agree On Nuclear Stress-Tests (WSJ)	56
Was NRC's Decision To Close Yucca Legal? (EED)	43	Japan Extended Reactor's Life, Despite Warning (NYT)	56
Yucca Has Allies, Even As Japan Suffers (LVS)	44	Japan Damage Cost: \$300 Billion (WSJ)	58
EDITORIAL: Obama's Nuclear Negligence (WT)	45	Japan's Leader Tries To Assuage Nuclear Concerns (WT)	58
Appeals Court To Hear Yucca Arguments (AUGC)	46	US Agrees To Help Chile Go Nuclear, Despite Japan Disaster (CSM)	59
Getting Rid Of Spent Nuclear Power Fuel (CHIT)	46		
Radiation Worrying You? Take A Vitamin (DISC)	47		
10 Things You Didn't Know About The Nuclear Regulatory Commission (USNEWS)	48		
International Nuclear News:			
Japan's Catastrophe Resonates At Economic, Regulatory And Personal Levels (WP)	48		
New Repairs Delay Work At Nuclear Plant In Japan (NYT)	50		
Smoke Plumes Set Back Japan's Efforts To Contain Nuclear Crisis (LAT)	51		

Online Version

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NRC NEWS:

No Urgent Changes Seen For US Nuclear Plants (NYT)

By Matthew L. Wald

New York Times, March 22, 2011

ROCKVILLE, Md. – A top official with the Nuclear Regulatory Commission said Monday that the nuclear crisis in Japan did not warrant any immediate changes at American nuclear plants.

The commission's inspectors at each site have been told to double-check that emergency equipment and precautions mandated years ago were still in place, including temporary hoses and fittings and other last-ditch backup equipment, said the official, R. William Borchardt, the executive director for operations.

The inspectors were also asked to verify that plant operators knew where the equipment and materials were, Mr. Borchardt said, "to make sure they haven't fallen into disuse because they haven't been used."

"Every single day, we assess whether or not there is some additional regulatory action that needs to be taken immediately in order to address the information we have to date," he said in a briefing to the commission.

The N.R.C. is to vote soon on a plan to conduct a 90-day study of the significance of the Japanese events for American reactors, the commission's chairman, Gregory B. Jaczko, said, with updates after 30 and 60 days. But Mr. Borchardt and other staff members have said repeatedly that they did not yet have a full picture of events in Fukushima.

The information emerging is sometimes contradictory. While the primary containment for two of the reactors was previously reported to have been damaged by explosions, Mr. Borchardt said that at this point they "appear to be functional." He was referring to the steel shells, shaped like inverted light bulbs, that surround the reactor vessels and a doughnut-shaped pool of water around them used for pressure suppression.

The secondary containment, the weaker, boxy buildings that also enclose the spent-fuel pools, have been heavily damaged by hydrogen explosions. That hydrogen was presumably created by fuel damage in the reactor vessels, and then vented to the secondary containment.

One question for American regulators is whether steps that they have ordered in the last 20 years, to "harden" the vent pipes, had also been taken in Japan, or whether at Fukushima those vents were simple ductwork that was overpressurized when workers opened valves to release excess pressure from the primary containment.

That is one of many questions that must be answered to determine the extent to which American plants are subject to the same hazards.

N.R.C. officials said they were confident about preparations already in place, but open to improvements. During the 90-minute briefing, two commissioners used the phrase "systematic and methodical" to describe the approach they wanted to use in applying lessons from Japan to America's nuclear plants.

As if to underscore the point, a different department of the commission announced Monday that the N.R.C. had issued a 20-year license extension to the Vermont Yankee reactor, which is a near twin of Fukushima Daiichi No. 1. Commission officials said that if the accident in Japan showed a need for changes in Vermont or elsewhere, they would order them promptly, even before the 20-year extension began.

One commissioner, Kristine L. Svinicki, said, "Some may characterize that our faith in this technology is shaken." But she added: "Nuclear safety is not and cannot be a matter of faith. It must be a matter of fact."

The commission has sent 11 staff members to Tokyo, where they are helping American Embassy officials to understand what is happening and, as commissioners put it, "interacting" with their counterparts at the Japanese nuclear safety agency and executives at Tokyo Electric Power Company.

Mr. Jaczko said Sunday that there were no plans to send the N.R.C. staff members to Fukushima itself. Commission officials said that two more N.R.C. groups would travel to Japan this week.

Japan Nuclear Crisis After Earthquake Doesn't Warrant US Changes, Official Says (AP)

By Matthew Daly

Associated Press, March 22, 2011

ROCKVILLE, Md. — The nuclear crisis in Japan, while severe, does not warrant any immediate changes in the United States, a top US nuclear official said Monday.

View full size Japan Defense Ministry photo via AP Japan Self-Defense Forces workers talk before starting to spray water toward Unit 3 of the troubled Fukushima Daiichi nuclear complex, Okumamachi, in northeastern Japan on Friday.

The Nuclear Regulatory Commission's executive director for operations, Bill Borchardt, said officials have "a high degree of confidence" that operations at the 104 nuclear reactors in 31 states are safe. He said inspectors at each of the plants have redoubled efforts to guard against any safety breaches.

Borchardt gave NRC commissioners a detailed look at the Fukushima Dai-ichi plant, damaged in the March 11 earthquake and tsunami, and the US response thus far.

Borchardt told commissioners that Units 1, 2 and 3 at the crippled Fukushima plant have some core damage, but that containment for those three reactors has not been breached.

"I would say optimistically that things appear to be on the verge of stabilizing," he said.

The Tokyo Electric Power Co., which operates the troubled plant, has been able to bring offsite power onto the site from a nearby transmission line, Borchardt said, the first sign of progress at the plant in recent days. Water is being injected into the reactor vessels in Units 1, 2 and 3, and containment in all three units appears to be functional, he said.

The five-member commission was reviewing the Japanese crisis — it is the worst nuclear disaster in a quarter-century — and was set to approve a 90-day safety review of operations at the US nuclear fleet to comply with a call last week by President Barack Obama.

NRC Chairman Gregory Jaczko said his agency has a responsibility to the American people to undertake "a systematic and methodical review of the safety of our own domestic nuclear facilities," in light of the Japanese disaster.

The nuclear plant's cooling systems were wrecked by the massive earthquake and tsunami that devastated northeastern Japan on March 11. Since then, conditions at the plant have been volatile; a plume of smoke rose from two reactor units Monday, prompting workers to evacuate.

As work at the plant continues, US officials will look to see whether information from Japan can be applied in the United States to ensure U. S. reactors remain safe, Jaczko said.

But even some of his fellow commissioners had questions about the US response.

Commissioner George Apostolakis wondered why the NRC did not close some older nuclear plants, as Germany did.

"Are we less prudent than the Germans?" Apostolakis asked.

Borchardt replied that officials "asked ourselves the question every single day, 'Should we take a regulatory action based upon the latest information?'" Each time, he said, the answer was no.

"I'm 100 percent confident in the review that we've done and we continue to do every single day that we have a sufficient basis to ... conclude that the US plants continue to operate safely," he said.

Borchardt also defended the commission's recommendation that US citizens stay at least 50 miles away from the troubled Fukushima plant. Current US guidelines call for a 10-mile evacuation zone around all US nuclear plants, and some critics have suggested that the NRC was imposing a stricter standard on Japan than on US nuclear reactors.

Borchardt said the recommendation about Japan was made based on conditions at the plant -- namely that there were degraded conditions in two spent-fuel pools at the site and likely damage to three of the reactor cores.

If the same conditions occurred in the United States, he added, "we would have done the same analysis and gone through the same thought process," and likely would have extended the evacuation zone and taken others steps to protect the public.

A spokesman for the Nuclear Energy Institute, an industry group, said US officials acted appropriately in recommending the 50-mile evacuation zone for US citizens in Japan.

"They acted cautiously based on the uncertainty of what the radiation exposures are at the plant," spokesman Steve Kerekes said.

NRC staff and other US experts have been in Tokyo for more than a week conferring with Japanese government and industry officials on the disaster. A second wave of NRC employees is heading to Japan this week, in many cases replacing workers who are already there.

NRC Readies Review Of US Plants (POLITCO)

By Darius Dixon

Politico, March 22, 2011

The Nuclear Regulatory Commission will conduct both a 90-day "snapshot" review of US nuclear plants as a result of the crisis in Japan, as well as a comprehensive long-term regulatory study once the situation has been averted.

The 90-day review will focus on any "obvious" emergency preparedness changes or procedures that need to be adjusted, Bill Borchardt, the NRC's executive director for operations, said Monday.

Any long-term review will include other federal agencies, including the Federal Emergency Management Agency, Borchardt said.

Ever since the nuclear crisis began overseas a considerable amount of attention has focused on reactors in the US with similar configurations as those experiencing problems at the Fukushima Daiichi facility. There are 23 reactors among the US nuclear fleet that are boiling water reactors with Mark 1 containment systems.

Borchardt assured the commission that the US has had a Mark 1 containment improvement program since the 1980s, a program he wasn't sure the Japanese had in place. One component of the improvement program required a more robust venting system that would have prevented the buildup of hydrogen that is believed to have caused explosions at several Fukushima reactor buildings.

NRC Sees Signs Of Stability In Japan, Plans Review Of US Reactors (GWIRE)

By Hannah Northey

Greenwire, March 22, 2011

Federal nuclear regulators issued a hopeful report today on Japan's nuclear crisis and outlined plans for a two-tiered review of the safety of 104 US reactors.

Containment Units 1, 2 and 3 at the crippled Fukushima Daiichi nuclear plant, which was rocked by a massive earthquake and tsunami on March 11, appear to be stabilizing, as are spent fuel pools at the complex, said Bill Borchardt, the US Nuclear Regulatory Commission's executive director of operations.

The earthquake affected 10 reactors, and the ensuing tsunami caused a loss of emergency power to six units at the Fukushima Daiichi plant. In the wake of explosions and fires at the power plant, NRC is now struggling to ascertain if Units 1, 2 and 3 have experienced core damage, Borchardt said.

"Today, all three units appear to be in a stable condition with seawater injection being used to keep the reactors cool," Borchardt told commissioners today. "Containment integrity for all three units is also currently maintained."

Although gray smoke was seen rising from the nuclear complex this morning, Borchardt said there were no indications of increased temperature or radioactivity at the plant (see related story).

Tokyo Electric Power Co. has extended power to a site near the crippled plant, and Japanese officials are in the process of laying temporary cables to pumps and valves in Units 1 and 2 and will do the same for Units 3 and 4 during the next couple of days, he said.

"The fact that off-site power is close to being available for use at plant equipment is perhaps the first optimistic sign that things could be turning around," Borchardt said.

NRC has sent at least 11 experts to Japan to gather information and consult with Japanese officials.

US reactor review

NRC could vote as early as today on plans to conduct a 90-day review of information coming out of Japan and how those findings relate to oversight of the fleet of US reactors.

The short-term review will provide a snapshot of US reactor safety and could evaluate how nuclear plants would deal with emergencies.

NRC reports will be made after 30 and 60 days and have limited stakeholder involvement, Borchardt said.

The plan will also address the implementation of a separate long-term review of technical issues and potential changes to NRC's oversight program and rulemakings, Borchardt said.

The commission has not stated a start date of that lengthier review because it would be launched after more conclusive information is obtained on the Japan disaster. That study, he said, will include "substantial stakeholder involvement."

Simultaneously, NRC has launched a plant-by-plant review that President Obama called for last week (E&ENews PM, March 17).

The commission is reviewing its 35-year regulatory framework in light of the Japan crisis.

Borchardt said the agency is confident in the safety of the US fleet. NRC has fine-tuned its regulations in response to past emergencies, including the partial meltdown at Pennsylvania's Three Mile Island power plant and the terrorist attacks of Sept. 11, 2001.

The agency has issued a notice to the industry that the commission will be following up to ensure that emergency responses at US reactors "haven't fallen into disuse because they haven't been used," Borchardt said.

US Plans More Nuclear Inspections After Japan Crisis (REU)

By Ayesha Rascoe And Timothy Gardner

Reuters, March 22, 2011

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

Nuclear Regulatory Commission To Get Update On Japan Crisis, Begin Review Of U.S Plant Safety (AP)

By Matthew Daly

Associated Press, March 22, 2011

WASHINGTON -- Nuclear energy regulators are meeting Monday to receive an update on the status of Japan's stricken nuclear complex and begin short-term and long-term reviews of US nuclear safety.

The five-member Nuclear Regulatory Commission will get an update from its staff on the ongoing crisis in Japan and devise a plan to meet President Barack Obama's call for a comprehensive safety review at the 104 US nuclear reactors.

NRC Chairman Gregory Jaczko said the agency was likely to perform a short-term review of existing nuclear reactors, "and then probably a much longer look" based on information from Japan.

Jaczko promised a "methodical" examination of the accident at the Fukushima Dai-ichi plant and a thorough review of US practices going forward.

NRC Likely To Approve Study Of Japan Nuclear Incident (CNN)

By Mike M. Ahlers, CNN

CNN, March 22, 2011

Rockville, Maryland (CNN) -- The Nuclear Regulatory Commission was poised Monday to begin a 90-day review of Japan's nuclear crisis -- including a 30-day "quick look" -- so that any lessons learned could quickly be applied to the 104 commercial reactors in the United States.

At the commission's first meeting since the March 11 earthquake and tsunami, NRC's staffers assured the five-member body they had "a high degree of confidence" in existing safeguards at US nuclear power plants. But the staff suggested both near-term and long-term reviews of problems that have plagued the Japanese reactors.

The 90-day study would use "all of the currently available information" out of Japan, and the staff would issue both 30-day and 60-day "quick look" reports to update the commission and allow for any necessary changes. Results will be made public, the NRC said, and longer term investigations would likely follow.

"Here in the United States we have an obligation to the American people to undertake a systematical and methodical review of the safety of our own nuclear facilities in light of the of the natural disaster and the resulting nuclear situation in Japan," said Gregory Jaczko, chairman of the NRC.

William Borchardt, the NRC's executive director for operations, said the NRC staff has continually asked itself whether it should be proposing regulatory changes in light of events in Japan. But existing information "if anything, it's given me a bit of confidence that all of these redundancies are paying off," he said.

The staff has concluded that "US plants continue to operate safely," he said.

"We do not expect the releases of radioactive material that have occurred in Japan to have any effect on the health and safety of the US population," he said. Naturally occurring radiation from the sun, rocks and other sources is "100,000 times" the amount measured in the US originating from Fukushima, he said.

Borchardt also gave a status report on conditions at the Fukushima Daiichi plant in Japan.

"In my view, the fact that the off site power is close to being available for use of plant equipment is perhaps the first optimistic sign we've had that things could be turning around," he said

"We believe that the spent fuel pools on units 3 and 4... that the situation there is stabilizing, that the containment in all three units 1,2, and 3 appear to be functional, and that there is water being injected into the reactive vessels in units 1,2, and 3," Borchardt added. "I would say optimistically that things appear to be on the verge of stabilizing."

Borchardt said the source of gray smoke seen emanating from Unit 3 Monday was unknown, but said there apparently "has been no increase in temperature or in radioactivity."

Borchardt also elaborated on a US government recommendation that US citizens evacuate from a 50-mile radius around Fukushima. That decision, he said, was based not on radiation readings, "but on what at the time was possible" given likely core damage in three reactors and problems at spent fuel pools. The recommendation was prudent and conservative, he said.

Borchardt testified the US principles which govern nuclear reactor safety – a "defense in depth" strategy, robust containment systems, redundant safety systems, and emergency preparedness – are being borne out by the Japanese experience. In particular, the Japan incident has shown the value of "station blackout" rules, which require nuclear plants to have backup systems in case electrical power is lost.

Borchardt said while the NRC has provided assistance to Japan, it has maintained its focus on its top responsibility, ensuring the safety of domestic nuclear power plants and materials.

The NRC has sent 11 of its personnel to Japan to assist in efforts there.

The commissioner of the NRC, William Ostendorff said, "I believe that our existing licensing and oversight activities assure us that our commercial nuclear plants in this country are safe. On the other hand, I know that we must and most certainly will conduct a thoughtful and rational examination of the NRC's regulatory framework with the information and lessons learned resulting from the instance in Japan."

Jaczko's Call On Fukushima Radiation Plucks US Regulator From Obscurity (BLOOM)

By Jim Efstathiou Jr. And Simon Lomax

Bloomberg News, March 22, 2011

Investors seeking some direction on the potential severity of Japan's nuclear crisis got it from a person most probably hadn't heard of until last week.

"We believe that the secondary containment has been destroyed and there is no water in the spent-fuel pool," Gregory Jaczko, chairman of the US Nuclear Regulatory Commission, said at a congressional hearing on March 16. "We believe that radiation levels are extremely high."

Stocks fell from the US to Russia, with the Standard & Poor's 500 Index ending the day down 2 percent. Currencies including the Australian dollar and Indonesian rupiah also fell, along with crude oil and copper. Market commentaries for an array of investments cited Jaczko's remarks.

Japan's nuclear crisis has thrust the agency that regulates US atomic power plants into the spotlight. Policy makers and financial markets alike are listening to its chairman, a 40- year-old native of upstate New York who associates say has been one of the most aggressive advocates of nuclear safety on the five-member commission.

Some lawmakers "probably might have had trouble telling you what NRC stood for" before the crisis in Japan, said Kevin Cook, a former senior Republican aide on the House Appropriations Committee. "Now it's taken a much higher profile," Cook, now a Prescott, Arizona-based energy consultant, said in an interview.

On the same day he testified to Congress, Jaczko briefed President Barack Obama on conditions at the Fukushima Dai-ichi nuclear plant. Based on his assessments, the US Embassy in Japan ordered that American citizens stay 50 miles (80 kilometers) from the reactor complex. Japanese officials had ordered an evacuation to about 12 miles away.

While the Associated Press said Japanese officials denied that the cooling pond at one of the reactors had dried up, a condition that could cause spent fuel rods to ignite and release radiation, Jaczko stood by his comments then, and again yesterday on C-Span.

"I really can't say that I have views on nuclear power or the nuclear industry," he said. "I have views on nuclear safety." His conclusion was based on reports from NRC experts on the scene, he said.

Attention on Jaczko and his commission will continue this week, starting with a public briefing on Japan today at the agency's headquarters in Rockville, Maryland, north of downtown Washington. Hearings are scheduled on reactor safeguards on March 24.

The crisis at the Japan plant may be "on the verge of stabilizing," Bill Borchardt, the NRC's executive director of operations, said at today's briefing.

The NRC, created by Congress to regulate nuclear safety in 1974, hasn't been as vigilant as its chairman might wish, said Representative Dennis Kucinich, an Ohio Democrat.

"He impresses me as someone who wants to do the right thing and of course the NRC has a tradition of not so much being a stern taskmaster of the industry," Kucinich said.

Jaczko, who declined through a spokesman to be interviewed, was nominated to the NRC in 2005 by President George W. Bush and named chairman by President Barack Obama in 2009. He earned a bachelor's degree in physics and philosophy at Cornell University in Ithaca, New York, before completing a doctorate in physics at the University of Wisconsin at Madison, according to the NRC.

Before joining the NRC, Jaczko was science adviser to current Senate Majority Leader Harry Reid, a Nevada Democrat, and worked for Representative Edward Markey, a Massachusetts Democrat and critic of nuclear power.

Jaczko has been on the losing side of NRC votes to strengthen safety measures, said Edwin Lyman, a physicist and expert on nuclear plant design at the Cambridge, Massachusetts-based Union of Concerned Scientists.

Greater exposure as a result of the crisis in Japan may translate into more pressure from Congress as the NRC prepares to rule on new nuclear reactor designs this year, Lyman said.

Last year, Jaczko ordered the NRC's staff to stop considering a proposed nuclear waste repository at Yucca Mountain, Nevada, a move that angered Republican lawmakers who say he overstepped his authority. Reid, Jaczko's former boss, was a vocal critic of the Yucca Mountain plan.

The NRC is "under tremendous pressure on the Hill as well as from industry to accelerate licensing actions," Lyman said yesterday on a conference call with reporters.

Jaczko said on C-Span yesterday that the NRC should be able to complete its review of failures at the crippled Fukushima plant before reaching a decision on new reactor licenses in the US. He compared the commission's work to its review of security measures at nuclear plants after the Sept. 11 terrorist attacks, which led to a requirement that operators add backup equipment to cool reactors and spent fuel pools.

"We think we have programs in place that would deal with the kinds of situations that we're seeing in Japan," he said on C-Span.

The crisis at the Fukushima plant began after it was struck March 11 by an earthquake and tsunami. The natural disasters knocked out backup generators needed to power systems to keep cool reactor fuel and spent nuclear fuel stored on site.

There are about 100 similar storage pools at about 60 sites in the US, said Robert Alvarez, a senior scholar at the Institute for Policy Studies and a former policy adviser to the US Energy Department.

A major test of the NRC will be how the agency addresses the issue of spent fuel storage, Alvarez said. Jaczko, who Alvarez characterized as "a straight shooter," may end up in the minority, he said.

"Even though he's chairman, there are other commissioners and he's just one vote," Alvarez said in an interview. "In order to fill seats on that commission, you have to get the OK from the nuclear industry."

Nuclear plant operators had misgivings about Jaczko when he joined the NRC and then became chairman, Kai Anderson, who served with Jaczko on Reid's staff, said in an interview. Jaczko was considered an "aggressive regulator," said Anderson, now a lobbyist at Cassidy & Associates in Washington.

"He's going to be the best thing that's happened to them in the last couple of decades because he's actually a real regulator," Anderson said. "If Greg Jaczko tells me something's safe, I believe him."

Martha Coakley Asks Feds To Re-examine Nuclear Storage (AP)

By Associated Press

Associated Press, March 22, 2011

BOSTON – Massachusetts Attorney General Martha Coakley is urging federal energy officials to re-examine the safety of the wet storage of spent fuel at nuclear power plants, including the Pilgrim Nuclear Power Station in Plymouth.

In a letter sent Monday to Energy Secretary Steven Chu and Nuclear Regulatory Commission Chairman Gregory Jaczko, Coakley said federal regulators need to take another look at the wet storage protocol, which is also used at the Vermont Yankee nuclear plant near the Massachusetts border.

It was also used at the damaged Fukushima Dai-ichi plant in Japan.

Coakley said federal regulators need to rescind their finding that wet fuel storage doesn't create an environmental risk, given the problems at the Japan nuclear power plant in the wake of an earthquake and tsunami.

"Despite our continuous advocacy for the NRC to consider alternative storage at these plants, the NRC has refused to do so, saying the risk of breach or fire is 'insignificant,'" Coakley wrote. "The event in Japan shows that such a breach can occur, and we are asking the NRC to revisit that assessment."

She said the NRC should consider mandating dry cask storage for spent fuel. She said the NRC has declined to release the full studies that they have used to argue that wet fuel storage is safe.

President Barack Obama has ordered a comprehensive review of US nuclear plant safety.

Coakley also said that she's "deeply concerned" that the federal government hasn't fulfilled its obligation to begin removal of nuclear waste in 1998, as required by the Nuclear Waste Policy Act of 1982. She said energy customers, including those in Massachusetts, have paid into the fund, which now totals \$24 billion.

The letter from Coakley was also signed by Massachusetts Senate President Therese Murray, whose district includes Plymouth.

Operators Of Indian Point Say Changes Are Likely (NYT)

By Patrick McGeehan

New York Times, March 22, 2011

WHITE PLAINS — The operators of the Indian Point nuclear power plant said Monday that they did not expect ever to face the combination of earthquake and flooding that devastated Japan this month. But in the aftermath of those disasters, they said, some regulatory changes were to be expected.

Executives of Entergy, which owns Indian Point, told the Westchester County Board of Legislators' Environmental and Energy Committee at a meeting here that it was too soon to know what should be done differently at the plant. They said they did not foresee a natural disaster of the same magnitude in the New York area; the plant is on the Hudson River in Buchanan, 35 miles north of Midtown.

But, they said, they did expect regulators to insist on some changes after the damage done to the Fukushima Daiichi Nuclear Power Station in Japan.

"I have no doubt there will be changes we make in response to this event," said John McCann, vice president of nuclear safety and licensing for Entergy. But, he said, he was "in no position" to say what they would be.

Mr. McCann reassured the legislators that Indian Point had been designed to withstand an earthquake much stronger than any on record in the region, though not one as powerful as the quake that rocked Japan. He said repeatedly that the greater threat to public safety in Japan had come not from the earthquake, but from the tsunami.

It was the tsunami, he said, that washed away the tanks of fuel for the emergency generators and left the Japanese unable to keep the plant's reactors cooled. Indian Point has several sources of power and water that should preclude a similar situation there, he said.

Even if all sources failed, he added, there were "severe-accident-management" plans drawn up, calling, for instance, for water from the Hudson to be pumped to the plant to keep the fuel rods and spent fuel rods from overheating.

But Michael B. Kaplowitz of Somers, chairman of the environment committee, asked, "How can you test that?" Mr. Kaplowitz wondered aloud if the plan amounted to calling in a "fire brigade" to pump water onto the rods to prevent a meltdown.

The Entergy executives said they had been storing spent fuel rods in 10 "dry casks" on concrete pads. The casks, they said, were designed to withstand the degree of shaking that would accompany an earthquake of magnitude 6.0 on the Richter scale, the same level, they said, that the plant could handle.

Some of the legislators seemed more worried about the plan for evacuating the area around Indian Point, especially after the Nuclear Regulatory Commission recommended that people in Japan stay at least 50 miles away from the crippled Fukushima

plant. The existing evacuation plan for Indian Point adheres only to the current federal standard of a 10-mile radius around a nuclear plant.

One legislator, Peter B. Harckham of Katonah, recalled having been among those evacuated after the accident at the Three Mile Island nuclear plant near Harrisburg, Pa., in 1979. "I can just tell you, it didn't work," he said. "It took us well over four hours to go a short distance."

Another legislator, William Burton of Ossining, said that he shared with his neighbors "a not-unreasonable fear of not being warned soon enough" of trouble at Indian Point.

"As soon as the siren goes off, I'll jump in my car and I'll be in gridlock on 9A before things start," he said, referring to a highway that runs along the Hudson.

Despite the advice the federal regulators gave to people in Japan, the Entergy executives expressed doubt that the evacuation zone would be expanded to reach as far as New York City. Asked if a feasible plan to evacuate much or all of the city could be drawn up, Entergy's director of emergency planning, Michael J. Slobodien, said neither he nor the federal regulators knew.

"We really don't have enough information to begin to answer that question," Mr. Slobodien said. He said the idea that regulators would demand an evacuation plan for an area beyond 10 miles was "rank speculation."

US Nuclear Plants Are Safer Than Japan's, But Operational Quality Needs Work (CWIRE)

By Peter Behr

ClimateWire, March 22, 2011

Are US nuclear reactors safe?

The short answer is "yes," Nuclear Regulatory Commission Chairman Gregory Jaczko tried to convey to anxious, impatient senators at a congressional hearing last week. The nation's chief nuclear regulator could give no other answer – an unsafe reactor would have to be shut down and fixed, or closed.

Taken as a whole, the 104 US commercial nuclear reactors have significantly improved their operating reliability and are more closely watched by on-site NRC inspectors and regional staff than in any other time in the industry's half-century history, according to NRC. From the 2005 to 2009 fiscal years, NRC recorded no "abnormal occurrences" – accidents or deficiencies that caused a major reduction in the protection of public health and safety.

The median measure of nuclear plant outage time and power reductions from equipment failures and human error was 1.2 percent in 2009. The figure exceeded 5 percent in the mid-1990s, according to the industry's Nuclear Energy Institute.

Behind that solitary "yes" to the question of safety, however, are caveats, conditions and footnotes that help fill NRC's enormous document library, addressing such crucial underlying questions: "how safe?" and "safe from what?"

Nuclear plants are considered the most sensitive, fault-intolerant industrial complexes that exist and the consequences of the worst-case failure of systems or equipment in emergencies can be catastrophic. A report last week by the Union of Concerned Scientists, an industry watchdog and critic, described a relative handful of cases in NRC records documenting startling operating errors that caused emergency reactor shutdowns and instances where emergency equipment failed to work. In some cases, the causes of problems had been known for months or years without correction, the report said.

"The reality is that equipment can sometime fail. Humans can make mistakes, and these are complex machines," said Anthony Pietrangelo, chief nuclear officer of the NEI. But the overall industry's performance, based on safety indicator benchmarks, is at or exceeding all-time highs, he said. The industry owners understand better than anyone the consequences of a serious failure, he said.

Charles "Chip" Pardee, chief operating officer of Exelon Generation, the largest US nuclear plant operator, acknowledged the operating challenges to the audience at this month's NRC-sponsored conference for nuclear operators. "We have entered a period where we have allowed ourselves perhaps a bit to stray from the basics of high-quality operations, such as quality operator – control room teamwork, the basic processes by which we operate our power plants 24 hours a day, seven days a week.

"We don't have the quality that we should have when we're out fixing or replacing equipment in our power plants. And associated with that is quality of repairs that that we're able to procure right now. ... We have too many premature [equipment] failures. All those are a high priority for industry," he said.

Addressing the fears from Fukushima

Today, the NRC staff will brief the commission on the staff's response to the worst such crisis in a quarter century – the devastation to the Fukushima Daiichi nuclear complex in Japan, which propelled fears and issues about nuclear power safety to the front of the world's consciousness.

NRC addressed those fears Friday in a unusual "information notice" to reactor operators that was released to the public to document the actions taken to strengthen US reactors after the Sept. 11, 2001, terrorist attacks. The possibility of a suicide attack on a nuclear reactor by terrorists in a seized commercial jetliner had never been part of the reaction protection scenarios, officials said then, and NRC ordered measures to protect reactors, control rooms and spent fuel storage pools against the conflagrations that could cause.

Those actions mark a difference between US reactors and Japanese counterparts of the same design, NRC says.

In response to the 9/11 order, issued in 2002, all US reactor licensees have verified their ability to "mitigate conditions that result from severe adverse events," including the loss of crucial operating and safety systems due "natural events, fires, aircraft impact and explosions," NRC said.

The plants can withstand a total loss of electric power – the "station blackout" condition that crippled the reactor and spent fuel cooling systems at Fukushima. And the plants are adequately protected against flooding from inside or outside the plant and have developed strategies for dealing with potential earthquake damage to critical facilities, the NRC statement said.

NRC and the NEI have noted that the GE Mark 1 design reactors at the Fukushima complex were retrofitted in the United States and installed with hardened vents that would remove hydrogen that escaped the primary reactor containment shell and carry it outside the second containment building. The Japanese reactors lacked that retrofit, Pietrangelo said, and so vented hydrogen collected inside the secondary containment buildings in Units 1 and 3, where it eventually exploded. The US reactor owners made the retrofits, and had they not, NRC would have ordered it, Pietrangelo said. "That's just one example," he said.

The Union of Concerned Scientists agreed last week that changes since 9/11 have indeed strengthened US reactors. "[T]here are more temporary generators, backup generators and firefighting capabilities than we had prior to 9/11," said David Lochbaum, UCS director of nuclear safety.

"While many of our plants may not be vulnerable to the one-two punch of earthquake and then tsunami, many of our reactors are in situations where earthquakes or hurricanes in the Gulf or ice storms in the Northeast or a tree in Cleveland can cause an extensive blackout that puts us in a very similar situation," he said.

Concern about spent fuel ponds

The area of greatest concern is the capacity of backup batteries at US reactors, which in many cases, can last four hours, half as long as most of the batteries at the Fukushima plant, Lochbaum said. The US plants may be able withstand what happened in Japan if battery capacity is increased, he said. "That's a question that remains to be answered."

The pools at the General Electric Mark 1 reactors, implicated in Japan's crisis, are at the top of the reactor building. Other reactor designs place the pools at ground level, where "they're less vulnerable to either acts of nature or acts of malice," according to Lochbaum.

"If I was king for the day or maybe for the week, the first thing I'd change would be our spent fuel pools in the reactors like the one in Japan [which] are almost filled to the brim," Lochbaum said. "And the risks from the spent fuel pools, either from an accident or from an act of malice, are about as high as you could possibly make them."

The new measures ordered by NRC include additional safeguards for the spent fuel pools, including means of adding makeup water and spraying water on spent fuel, two of the desperate measures Japan's Self-Defense Force has used to control radiation from exposed spent fuel at the Fukushima complex. NRC has issued confidential directives on handling spent reactor fuel on a case-by-case basis, but the 23 Mark 1 reactors in the United States still have their spent fuels "in the attic," Lochbaum said.

The actions to strengthen reactors noted in NRC's information notice Friday took years to complete and verify. NRC ordered the additional measures in February 2002. In December 2006, after completing plant assessments, the NEI issued guidelines for meeting the NRC requirements, and the NRC staff endorsed these strategies.

It took until December 2008 for the NRC staff to verify that all of the reactors were in compliance, NRC said.

The response by the industry and its regulator demonstrate the reality that protecting reactors is a function of judgment and economics, Lochbaum said in a phone briefing for reporters last week. Judgment determined how severe a threat reactors must be ready to withstand. Economics plays a crucial part in how far regulators go in demanding safety measures.

Lochbaum said that his predecessor at UCS, Bob Pollard, "used to say that he has no doubts in his mind that you could design and operate an inherently safe reactor, and he has no doubt in his mind that he could – you could design and operate an inherently economic reactor. Where doubts arose was where you tried to do both. You could design a reactor to be bullet-proof, but nobody's willing to pay for it. So, that's the challenge."

Jaczko described to senators the NRC process that assess natural disaster threats to reactor plants, a methodology based on historical worst-case threats, which adds a substantial margin of protection over that. When new information is received, the

calculation is repeated. For example, new data about earthquake severity in the central and eastern US has been compiled by the US Geological Survey and will be used to re-evaluate hazards facing plants. If action is needed, it will be taken, NRC says.

The judgment factor in assessing risk remains, however. One extreme example reviewed recently by the Federal Energy Regulatory Commission, centers on the extreme peril of a once-in-a-century solar flare -- a geomagnetic storm -- that if large enough, could disable large sections of the power, leaving reactors dependent upon diesel-fired backup generation. In that emergency, would the power outage prevent fueling depots to replenish diesel fuel to keep emergency systems working at the nuclear plants until the grid's power could be brought back up? Is that risk considered too remote to be included in the threat scenarios reactors must be prepared to survive?

Building safer new reactors

The spurt of new reactor construction around the world -- including two US projects whose developers are anticipating NRC license approval -- involved new reactors that are generally considered to be safer than the 40-year-old designs built during the nuclear industry's expansion in the 1960s and '70s.

Some experts believe that the reactors designed by France's Areva SA are the safest of the new designs because of the additional redundancy of safety measures and emergency systems, including four emergency response systems and a "core catcher" structure that is meant to capture and spread out molten nuclear fuel that burned through the reactor vessel to prevent a resumption of a chain reaction.

Areva was jolted in 2009 by the loss of \$40 billion contract to build new reactors in the United Arab Emirates, which selected a less expensive design from Korean Electric Power Co. Following last week's Japanese crisis, Areva CEO Anne Lauvergeon stressed the high safety standards of Areva's new EPR reactor and its ability to survive earthquakes and plane crashes, noted a report last week in MarketWatch. She told reporters that the EPR would have withstood the 9.0 quake in Japan and the tsunami without leaking. "At one time, the EPR was criticized for being too safe. Today with the Fukushima catastrophe that is over," she said.

The NRC's role, however, is to determine whether each proposed reactor design that comes before it is safe, not to assess which design is safest, and make that the standard for approval.

While new designs are seen as safety that the older US reactors, the older models have not remained unchanged.

NRC's Jaczko was pressed last week by Sen. Frank Lautenberg (D-N.J.) about the relatively safety of the GE Mark 1 plant and tried to explain that there have been several significant safety improvements to the original design. Moreover, all of the older US reactors are undergoing a constant replacement of pumps, valves, piping, electronics, turbines, steam units and even reactor vessel heads.

Jaczko tried to make an analogy to aircraft that are refitted to keep flying (perhaps thinking of the Air Force B52 bomber, some of which are still in service a half-century after production stopped), but Lautenberg dismissed that reasoning, chastising Jaczko for "poor judgment."

In fact, US reactors undergo changes not merely to retrofit old equipment but to expand the capacity of old plants.

Changes that increase the capacity of existing plants

NRC's website reports that as of January 2008, the commission had approved 116 uprates, resulting in a gain of about 5,200 megawatts capacity -- equivalent to more than five new reactors. Applications for another 5,000 megawatts of uprates are anticipated, according to an October 2009 review in Power Electronics -- equivalent to another five new reactors. The US nuclear "renaissance" thus far is largely a case of renovation.

Uprates require new equipment and so does extending the lives of the existing reactors. The changes can improve safety by exchanging older equipment for improved new versions. But they create opportunities for errors by installers and contractors.

Of the 104 US commercial nuclear reactors, 62 have been approved to operate for an additional 20 years beyond the initial 40-year license period and most of the rest are expected to seek license renewals, including the Diablo Canyon plant near San Luis Obispo, Calif., which faces threats from onshore and offshore seismic faults.

The NRC staff of 4,000 is required to assure continued safe operations in passing on applications for relicensing and uprates, at the same time that it reviews safety of new designs, sites for new reactors and oversees the hour-by-hour safety performance of existing reactors. While its staff has grown substantially, half have been at NRC less than five years.

NRC documents significant operating "incidents" that its on-site inspectors find or that the reactor owners self-report, and if a pattern of issues appears, the NRC staff will impose steadily increasing inspection requirements, coupled with publicly reported grades on compliance.

The Union of Concerned Scientists and other NRC critics say that the federal commission does not come down hard enough on safety violations. "It isn't their fault," Lochbaum maintains. When NRC leans too hard, members of Congress step in,

complaining, "You are going to put these guys out of business.' So, the NRC, since their budget is controlled by the United States Congress, they listened," he said. NRC and the industry strongly disagree.

The industry's fear of another Three Mile Island accident, and NRC's increased attention, contribute to the outage rate approaching 1 percent from equipment failures and human mistakes, NEI says. The question in the aftermath of the Japanese reactor is crisis is, "Is that good enough?"

US Reactors Vulnerable In Event Of Japan-scale Crisis (REU)

By Deborah Zabarenko

Reuters, March 22, 2011

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

Japan's Nuclear Crisis Reignites Safety Debate (USNEWS)

By Jessica Rettig

US News and World Report, March 22, 2011

Some lawmakers are urging the domestic nuclear industry to use the Japanese tragedy as a real-life lesson on safety. "We have a lot of nuclear plants right here, and some of them are very much the same as what they have in Japan," says California Democratic Rep. Henry Waxman. "Japan is a technologically capable country, and they anticipated earthquakes and tsunamis, but still they didn't have all the failsafes to stop this tragedy from occurring. So, we need a full inquiry as to how this happened, why it happened, what we can do to build in security features in the United States. Until that happens, we ought to step back from the direction that Republicans are taking, which is heavily reliant on nuclear."

On Friday, Vermont Democratic Sen. Bernie Sanders wrote a letter to the president urging him to issue a moratorium on all NRC licensing and re-licensing decisions.

Nuclear Energy Institute spokesman Tom Kauffman says the nuclear industry has reason to remain confident that plants within the United States are safe. "All of our plants—whether they're on the [West] Coast or in the eastern part of the country—each plant is constructed to withstand the maximum projected earthquake at that site. It's a site-by-site situation that is revisited on a regular basis," says Kauffman. "There's going to be changes, but there's still going to be growth."

With 104 operating nuclear plants in the United States, nuclear power makes up approximately 20 percent of the total US energy profile. As an arguably cleaner alternative to coal, gas, and oil, nuclear energy has gained bipartisan support in recent decades, especially as plants proved their safety. But the industry has faced an uphill battle, says Ferguson, even before the Fukushima plant began to break down. It has been more than three decades since construction began on a new nuclear power plant in the United States. The nuclear industry ascribes this to lack of financing, regulatory obstacles, and concerns over safety. [Take the US News poll: Should the US put a hold on building new nuclear power plants?]

Several lawmakers emphasized their commitment to nuclear power on Capitol Hill last week as they questioned federal experts on the safety of domestic plants. President Obama also continues to support nuclear energy, maintaining his request to Congress for \$36 billion in loan guarantees for nuclear projects in next year's budget. Energy Secretary Steven Chu on Wednesday told Congress that the administration would wait to see what can be learned from Japan before halting the growth of nuclear power.

According to Kauffman, there are two reactors nearing construction in Georgia and another pair in South Carolina. Both have been designed using advanced "passive" safety mechanisms, unlike the "active" safety mechanism that failed in Japan. With the newer technology, the plants employ automatic cooling mechanisms that do not rely on external energy sources to keep the fuel rods stable.

Around the world, countries fearful for their own plants' integrity have pulled back operations at nuclear facilities. Germany, for example, announced that they would shut down plants that began operating before 1980. The European Union, which still remembers the world's greatest nuclear disaster to date in 1986 at Chernobyl, vowed last week to perform "stress tests" on nuclear plants there. And China, which had planned to increase its nuclear power seven-fold in the next decade, has pledged to stall approvals for pending nuclear projects. There has also been a run worldwide on potassium iodide pills, which help guard against the adverse health effects of radiation.

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NEWS ANALYSIS: Japan Crisis Puts Global Nuclear Expansion In Doubt (PLATTS)

Platts, March 22, 2011

The crisis at Japan's Fukushima nuclear plants has prompted leading energy-consuming countries to review the safety of their existing reactors and cast doubt on the speed and scale of planned expansions around the world.

The events at the Fukushima-1 plant already rank as the worst nuclear incident in the world since the Chernobyl disaster in what is now Ukraine in 1986, and have renewed public fears about the safety of nuclear power.

The emergency comes at a critical time for the industry, with governments in most of the world's biggest economies looking to build new nuclear power plants as they seek to build new baseload generation capacity without increasing carbon emissions.

In China, the government ordered safety inspections of the country's existing nuclear plants and suspended approval of new projects.

China operates 13 nuclear plants and is building more than two dozen others, putting it at the center of the global expansion of nuclear power.

Further ahead, the country has plans for another 50 or more plants as it struggles to meet soaring demand for energy.

In India, the government has ordered safety checks at its existing plants but has not ordered a rethink of ambitious expansion plans.

"China and India will lead in the global construction of more than 80 GW over the next decade. As a minimum, we expect this incident will slow expansion plans while lessons are learnt. In a more extreme scenario, there could be a public backlash against nuclear power which could substantially reduce the planned build out," Bernstein Research analysts said last week.

GERMAN CLOSURE

One of the most immediate reactions to events in Japan came from Germany, where Chancellor Angela Merkel's government announced the temporary closure of the country's seven oldest nuclear reactors, with a combined capacity of 7 GW.

The reactors are being taken off line within the framework of a three-month moratorium on lifetime extensions in the Nuclear Energy Act. Passed in October 2010, the law extends the lifetimes of the seven reactors commissioned before 1980 by eight years, and newer reactors by 14 years.

Widely criticized as unconstitutional, the moratorium may have to be followed by an amendment to the law.

German public opinion was already hostile to the idea of new nuclear plant, and the country was looking to gradually replace existing nuclear capacity with renewables.

Switzerland moved as swiftly as Germany in taking action. On March 14, Swiss President and Energy Minister Doris Leuthard said authorization processes for three new reactors would be put on hold while safety standards were checked and, if necessary, revised. Existing plants will also be re-examined, she said.

"In Japan there are two problems: the age of the reactors and the emergency systems. The situation is very similar in Switzerland. The damaged reactors in Japan are from the same generation as Muhleberg and Beznau. Fukushima-1 is more or less the same type of reactor as our 40-year-old Muhleberg," said Walter Wildi, a former president of the Swiss Nuclear Safety Inspectorate.

There was a cautious reaction from the UK, where the government is hoping nuclear power will play an increasingly important role in generating low-carbon electricity.

UK REPORT

UK Energy and Climate Change Minister Chris Huhne called on chief nuclear inspector Mike Weightman to draw up "a thorough report on the implications of the situation in Japan and the lessons to be learned."

A draft, to be prepared in cooperation internationally with other nuclear regulators, is to be produced by mid-May and a final report by September.

"It is essential that we understand the full facts and their implications, both for existing nuclear reactors and any new program, as safety is always our number one concern," said Huhne.

In evidence to the Climate Change Committee on market reform, Huhne was critical of politicians elsewhere in Europe rushing to judgement, but recognized the Japanese disaster could damage investor appetite for nuclear, and was wary an over-reaction could increase costs of new build unnecessarily.

"France and the UK, the two EU countries where new nuclear plants are due to be operating this decade are, due to their geography, more protected from such natural disasters and therefore the new build program is unlikely to stop," Citi said in a report last week.

"In Germany, where a law extending nuclear lives was approved last year but faced strong opposition from the public and is being challenged by state governments, the anti-nuclear sentiment could intensify further," it said.

In the US, President Barack Obama has ordered the Nuclear Regulatory Commission to conduct a "comprehensive" safety review of nuclear power plants.

Obama told a press briefing the US had gone through "exhaustive studies" to ensure safety under natural disasters, but that it could nonetheless learn from the crisis in Japan.

LONG-TERM IMPLICATIONS

Although global nuclear expansion plans may get back on track, some analysts suggest the Fukushima disaster will have long-term implications.

Bernstein said it could prompt a longer-term shift to gas, with the world buying an additional 25-50 million mt/year of LNG, on top of the doubling of LNG requirements from 200 million mt/year to 400 million mt/year over the next decade to 2020.

"The only low carbon fuel which can compete with nuclear power in baseload power generation is natural gas. As a result of this incident, we expect that gas-fired power generation will grow more quickly than expected," Bernstein said.

Despite the challenges, global efforts to combat the negative effects of climate change cannot succeed unless nuclear power is part of world's mix of electricity generation, Societe Generale said in a report.

It said that in addition to 442 operational reactors around the world, 103 GW of new nuclear power is expected to come online before 2020 and 162 GW before 2030.

"Nuclear is seen by many only as a 'bridge' to the future zero-emission power technologies to be developed and made economical for large scale deployment. But this bridge is necessary," the bank said.

NRC Plans Meetings To Discuss Reactors In N.Y., S.C. (GWIRE)

By Hannah Northey

Greenwire, March 22, 2011

Federal regulators plan to discuss the safety of two controversial nuclear power plants in meetings this week.

The Nuclear Regulatory Commission is holding the meetings ahead of a safety review of the country's 104 nuclear reactors ordered last week by President Obama in the wake of a massive March 11 earthquake and tsunami that crippled reactors in northeast Japan on March 11 (E&ENews PM, March 17).

At issue for NRC this week: Entergy Corp.'s Indian Point Power Plant, which is on the Hudson River about 25 miles north of New York City, and Progress Energy Inc.'s H.B. Robinson Nuclear Plant, near Hartsville, S.C.

"After watching the events in Japan and having previously opposed the Indian Point plant, this past Tuesday, I requested the White House schedule a meeting between my staff and senior members of the Nuclear Regulatory Commission," New York Gov. Andrew Cuomo (D) said in his March 19 online statement. Cuomo said the meeting is scheduled for tomorrow.

New York Attorney General Eric Schneiderman (D) last week called for NRC to take into account seismic activity in the region before relicensing the 40-year-old Indian River plant (E&ENews PM, March 18).

Entergy is asking NRC to renew licenses for Indian Point's Unit 2 and Unit 3 for another 20 years. Current licenses expire in 2013 and 2015, respectively.

NRC is holding a separate meeting in South Carolina on Thursday to discuss the Robinson nuclear plant. The agency says the single-unit 710-megawatt pressurized-water reactor operated safely last year, but the NRC staff is increasing its oversight and inspection there because the facility exceeded the threshold for unplanned shutdowns in the third quarter.

Inspections also generated three findings of "low to moderate safety significance," including Progress Energy's failure to correct a problem with an emergency diesel generator and failure to adequately design and start operator training associated with reactor coolant pump seals.

"The NRC evaluates nuclear power plants in a systematic and detailed way each year," NRC Region II Administrator Victor McCree said in a notice posted on the agency's website. "These reviews and the additional inspections and oversight at Robinson will ensure that the plant is operated in a way that protects people near the plant and the environment."

The nonprofit Union of Concerned Scientists released a review of US power plant safety concerns Thursday that pointed to fires and equipment malfunctions at the Robinson and Indian Point plants (ClimateWire, March 18).

The report highlights 14 significant safety-related events at the plants that it said occurred because reactor owners and regulators "tolerated known safety problems."

Despite Calls To Slow Down, NRC Grants Vt. Renewal (AP)

Associated Press, March 22, 2011

MONTPELIER, Vt. (AP) — Federal regulators on Monday gave the Vermont Yankee nuclear plant a 20-year license renewal, despite calls for reconsideration following the nuclear disaster in Japan.

Issuance of the license was a foregone conclusion after the NRC voted to approve it on March 10, one day before an earthquake and tsunami triggered the still unfolding crisis at the Fukushima reactors in northeastern Japan, which are of the same design and about the same age as Vermont Yankee.

Vermont Yankee spokesman Larry Smith said officials there and with the plant's parent company, New Orleans-based Entergy Corp., were pleased to have the license in hand. But he added, "It's not a cause right now for any celebration in light of world events."

"I think the NRC has done their job," Smith added. "This has been a five-year review. There's been ample opportunity for people to weigh in."

The license renewal was granted a year to the day before Vermont Yankee's initial 40-year license was to expire. The plant still must be relicensed by the state, but the Senate last year rejected the idea, leaving its future uncertain.

The renewal was the first granted by the NRC since events in Japan began to unfold 10 days earlier.

Sen. Bernie Sanders, I-Vt., had issued a statement Sunday calling for a moratorium on new licenses or license renewals for US reactors in the wake of the Japanese crisis.

"It's hard to understand how the NRC could move forward for a license extension for Vermont Yankee at exactly the same time as a nuclear reactor of similar design is in partial meltdown in Japan," Sanders told The Associated Press. "The idea of keeping Vermont Yankee open... until it is 60 years of age defies comprehension."

Vermont Yankee, which operations in 1972, is located in Vernon, in Vermont's southeast corner, within sight of New Hampshire across the Connecticut River and about three miles from the Massachusetts line. It's a General Electric Mark 1 boiling water reactor, as are the Fukushima reactors.

Entergy bought Vermont Yankee in 2002 from the group of New England utilities that had owned it and boosted its power output in 2005.

Vermont Yankee announced in January of 2010 that test wells had turned up evidence that radioactive tritium had leaked from underground pipes at the plant into surrounding soil and groundwater. Within days it was revealed that plant executives had misled state lawmakers and regulators – the latter under oath – by saying the plant did not have the type of underground pipes that carried radioactive substances.

Vermont is the only state in the country with a law calling on its Legislature to give the go-ahead before state regulators issue the state permit the plant also needs to operate past March of 2010. A month after the revelations about the tritium leaks, the state Senate voted 26-4 against allowing the plant to renew its state permit. After the Senate killed the measure, it never went to the House.

Vermont Nuke Plant Gets Federal OK For 20-Year Renewal (AP)

By Dave Gram, Associated Press

Associated Press, March 22, 2011

MONTPELIER, Vt. – Federal regulators on Monday gave the Vermont Yankee nuclear plant a 20-year license renewal, despite calls for reconsideration following the nuclear disaster in Japan.

Sen. Bernie Sanders, I-Vt., issued a statement Sunday calling for a moratorium on new licenses or license renewals for US reactors in the wake of the Japanese crisis.

"It's hard to understand how the NRC could move forward for a license extension for Vermont Yankee at exactly the same time as a nuclear reactor of similar design is in partial meltdown in Japan," Sanders told The Associated Press. "The idea of keeping Vermont Yankee open ... until it is 60 years of age defies comprehension."

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Vermont Yankee spokesman Larry Smith said officials there and with the plant's parent company, New Orleans-based Entergy Corp. (ETR), were pleased to have the license in hand. But he said, "It's not a cause right now for any celebration in light of world events."

"I think the NRC has done their job," Smith said. "This has been a five-year review. There's been ample opportunity for people to weigh in."

The license renewal was granted a year to the day before Vermont Yankee's initial 40-year license was to expire. The plant still must be relicensed by the state, something that is not at all certain.

The renewal was the first by the NRC since events in Japan began to unfold 10 days ago.

Vermont Yankee, which started operating in 1972, is in Vernon, in Vermont's southeast corner, within sight of New Hampshire across the Connecticut River and about three miles from the Massachusetts state line. It's a General Electric Mark 1 boiling water reactor, as are the Fukushima reactors.

Entergy bought Vermont Yankee in 2002 from the group of New England utilities that owned it and boosted its power output from 530 megawatts to 650 megawatts in 2005.

Vermont Yankee announced in January 2010 that test wells had turned up evidence that radioactive tritium had leaked from underground pipes at the plant into surrounding soil and groundwater. Within days it was revealed that plant executives had misled state lawmakers and regulators – the latter under oath – by saying the plant did not have the type of underground pipes that carried radioactive substances.

Vermont is the only state in the country with a law calling on its Legislature to give the go-ahead before state regulators issue the Vermont permit the plant also needs to operate past March of 2010. A month after the revelations about the tritium leaks, the state Senate voted 26-4 against allowing the plant to renew its state permit. After the Senate killed the measure, it never went to the House.

Sanders Asks Obama For Moratorium On License Renewals For Nuclear Plants (VTD)

Five-Point Emergency Plan Also Calls for Independent Probe

VTDigger, March 22, 2011

BURLINGTON, Vt., March 20 – In the aftermath of the nuclear disaster in Japan, US Sen. Bernie Sanders urged the White House to form a presidential commission on nuclear safety in the United States as part of a five-point crisis response.

In a letter to President Barack Obama, Sanders (I-Vt.) also asked for a moratorium on license renewals by the Nuclear Regulatory Commission. He said the White House should withdraw a request for \$36 billion to bankroll building new nuclear

plants. He questioned why taxpayers – not nuclear plant owners – are on the hook for damages in the event of a meltdown or other accident at a private power plant. And he said states should get more say on plant safety.

Sanders serves on the Senate committee that oversees the NRC, the federal agency that regulates commercial nuclear reactors in this country.

One day before the massive earthquake and tsunami struck Japan, the NRC authorized a 20-year extension for the Vermont Yankee reactor in Vernon, Vt., after its 40-year operating license runs out next year. Days later, at a committee briefing on the Japan crisis, Sanders urged NRC Chairman Gregory B. Jaczko to reconsider that decision.

At the Senate Environment and Public Works Committee briefing and in his letter to Obama, Sanders said it is disturbing that 23 reactors in the United States, including Vermont Yankee, are virtually identical in design to the crippled reactors at the Fukushima Daiichi plant in Japan. Federal safety officials have criticized the General Electric design and warned as long ago as 1972 that if the cooling systems ever failed and fuel rods overheated then the containment vessel surrounding the reactor probably would burst, spewing dangerous radiation into the environment.

Sanders' letter to Obama called for:

- + An independent review by a special presidential commission with broad authority and a mandate to independently review the safety of every existing nuclear reactor and waste site in the United States, in light of the lessons that may be learned from the situation in Japan.

- + A moratorium on all licensing and re-licensing decisions by the NRC. China already is conducting a full review of safety at its nuclear plants and halted new construction. Germany closed seven reactors to review safety. In this country, New York Gov. Andrew Cuomo wants to shut down the Indian Point nuclear plant, which is operated by Entergy, the same company that runs Vermont Yankee.

- + Repealing a federal law that indemnifies the nuclear industry. "In the event of a nuclear tragedy in the United States, should the taxpayers of this country be asked to provide billions of dollars in compensation to the victims of such a tragedy or, in a free-enterprise society such as ours, should the nuclear industry itself take full responsibility to secure insurance in the private market for all consequences of such an unthinkable tragedy?" he asked.

- + Withdrawal of an Obama administration request for \$36 billion in new lending authority to build more nuclear power plants. Instead, Sanders said existing nuclear loan guarantee funds should be redirected to enhance energy efficiency and to develop safer, more cost-effective energy sources such as solar, wind, biomass, and geothermal.

- + Giving states a say on the safety of nuclear plants. "It will be people who live in the vicinity of nuclear power plants who will have to bear the burden of any tragedy that might occur, and for this reason alone they should play a meaningful role in deciding whether or not the safety risk is acceptable," Sanders wrote.

Sanders commended Obama for providing assistance to Japan as it grapples with the consequences of the natural disaster and nuclear crisis. "It is clear that at the same time we do everything we can to provide such assistance, we have an obligation to learn from this catastrophe and respond accordingly. The proposals I have put forward would ensure that the United States begins a long-needed, thoughtful and critical reconsideration of the safety of our nuclear reactors, and the wisdom of moving forward with a spate of new reactors."

Contact: Michael Briggs (202) 228-6492.

NRC Issues New License For Yankee (BRATBORO)

Brattleboro (VT) Reformer, March 22, 2011

BRATTLEBORO – Just past 11 a.m. this morning, the Nuclear Regulatory Commission issued a new 20-year license for Vermont Yankee nuclear power plant in Vernon.

The issuance of the renewed operating license is the culmination of an NRC review process that began with the submittal of the application for a 20-year license extension on Jan. 27, 2006.

The NRC staff had earlier completed its environmental assessment in August 2007 and safety evaluation in February 2008 for the application.

The independent Advisory Committee on Reactor Safeguards (ACRS) also reviewed the proposal during meetings in 2007 and 2008. Then, on March 10, the Commission addressed the last remaining contention in the hearing process on the application, when it dismissed an appeal from the New England Coalition.

Vermont Yankee Has 20-year Extension License In Hand (BOS)

By Beth Daley, Globe Staff

Boston Globe, March 22, 2011

The Nuclear Regulatory Commission issued the Vermont Yankee nuclear power plant a 20-year license extension today, but the plant must still get state legislative approval to continue operating after its license expires next year.

The NRC had instructed its staff to issue the renewal the day before the Japanese earthquake and tsunami but then placed a hold on the license because agency staff were too busy aiding Japan. Opponents of the Vernon reactor near the Massachusetts border hoped the pause would translate into a deeper review of the plant, which has the same design as the crippled Fukushima Daiichi nuclear facility in Japan that has released radioactive material.

"Today's action comes after five years of careful and extensive review and confirms that Vermont Yankee is a safe, reliable source of electricity and capable of operating for another 20 years," said Vermont Yankee spokesman Larry Smith in a statement.

NRC officials said today its staff had completed an in-depth review since Vermont Yankee first filed for an extension in 2006, including an environmental assessment in 2007 and safety evaluation in 2008. The independent Advisory Committee on Reactor Safeguards also reviewed the proposal.

Vermont is the only state in the country that requires the Entergy-owned plant to get legislative approval for an extension. Last year, the state Senate voted 26-4 to close the plant when its license expires next year. Entergy has declined to discuss its plans, saying it is a "legal matter." On Sunday, a vigil was held outside the plant to show solidarity with Japan but also to protest nuclear power. Police said about 250 people attended but organizers say there were twice that many.

Vermont government Peter Shumlin called the NRC's license issue "puzzling".

"Fortunately, Vermont has taken steps to close down the aging Yankee plant, and I have urged other states with older nuclear facilities to follow our example and take control of the lifespan of their plants," said Shumlin.

Yesterday, Massachusetts Attorney General Martha Coakley called on the NRC to place more scrutiny on spent fuel pools at Vermont Yankee and the Plymouth-based Pilgrim nuclear power plants because of the growing number of spent rods on site from the reactors near 40-year operation.

Entergy's Vermont Nuclear Plant Gets NRC Extension (WSJ)

By Naureen S. Malik

Wall Street Journal, March 22, 2011

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

NRC Grants Entergy 20-year Renewal For Vermont Yankee Nuclear Power Plant (NOTP)

By Jonathan Tilove, The Times-Picayune

New Orleans Times-Picayune, March 22, 2011

WASHINGTON – The Nuclear Regulatory Commission on Monday renewed Entergy's license to operate the Vermont Yankee nuclear power plant for another 20 years.

But the future of the plant, which began commercial operation in 1972, remains very much in doubt

Vermont's new governor, Peter Shumlin, was elected last fall on a pledge to shut down the plant when its current license expires next year.

The Vermont Legislature and public opinion in the home state of Ben and Jerry's seem equally ill-disposed toward keeping the plant operating. And, most significantly, Vermont is the only state in the union where the Legislature has veto power over extending the plant's life.

And then, of course, there is the earthquake and tsunami in Japan and the crisis at the Fukushima Daiichi plant that is now the center of the most serious nuclear accident since Chernobyl, and which, like Vermont Yankee, relies on GE boiling-water reactors with Mark 1 containment system.

"It is hard to understand how the NRC could move forward with a license extension for Vermont Yankee at exactly the same time as a nuclear reactor of similar design is in partial meltdown in Japan," the Vermont congressional delegation said in a joint statement. "We believe that Entergy should respect and abide by Vermont's laws and the (memorandum of understanding) signed with the state in 2002, which require approval by the Vermont Legislature, and then the Vermont Public Service Board, for the plant to continue to operate beyond 2012."

"In light of the on-going crisis at the 40-year-old Fukushima Daiichi nuclear facility in Japan that has prompted other states and nations to review their nuclear power issues, today's decision by the NRC to issue an extension of Vermont Yankee's license is puzzling," said Shumlin. "Fortunately, Vermont has taken steps to close down the aging Yankee plant, and I have urged other states with older nuclear facilities to follow our example and take control of the lifespan of their plants."

Entergy spokesman Michael Burns said, "Entergy is pleased that the NRC issued the extension of the operating license for Vermont Yankee through March 21, 2032, as announced on March 10. Today's action comes after five years of careful and extensive review and confirms that Vermont Yankee is a safe, reliable source of electricity and capable of operating for another 20 years."

But Shumlin said that the lessons for America from the other end of the world are clear.

"We have 104 aging nuclear reactors in America and we're suffering from a policy of irrational exuberance that we can continue to run them all 20 or 30 years beyond their engineered life," said Shumlin. "That's a recipe for disaster. It's just a question of when. Japan should serve as a sober reminder of our irrational exuberance."

Shumlin said Vermont Yankee, located along the Connecticut River near the Massachusetts line, was of special concern because of its ownership and management, which he said were guilty of a series of "misrepresentations and mishaps and leaks," that had squandered the good will Vermonters had for the plant's builders and original owners - a consortium of Vermont and New England utilities that sold Vermont Yankee to Entergy in 2002.

"I'm not opposed to nuclear power," said Shumlin. "I was a big supporter of the plant, it was in my Senate district, it was a big employer and the owners invested in maintenance of the plant and told the truth."

But now, he said, "we kind of feel we have an aging, leaking nuclear power plant run by a company we can't trust and it's prudent to shut it once its license expires in 2012."

Entergy takes a very different view of Vermont Yankee's viability.

"The case for the continued operation of Vermont Yankee is compelling," said Entergy's Burns. "The plant provides safe, clean, and reliable power to Vermont businesses and homes. The plant is a top industry performer across a broad range of operational standards. The economic benefits to the state of Vermont from Vermont Yankee's operation are substantial. The plant is key to the reliability of the electric grid in New England. We are hopeful that these facts will be taken into account as we seek a constructive resolution of our issues with the state of Vermont."

Vermont is the only state in the country that prohibits its Public Service Board from issuing a certificate to permit a plant to continue operating beyond its scheduled license without an affirmative vote of its Legislature.. It won't likely happen. The Senate, under the leadership of Shumlin when he was Senate President, has already voted 26 to 4 against allowing Vermont Yankee to continue operating when its license expires next March.

The day before the Japan earthquake, the NRC indicated it planned to OK renewal, but the actual issuance was delayed until Monday as the commission staff turned its attention to events in Japan.

Shumlin said the NRC has been clear that, despite its plans to issue a new license, "Vermont has the right to determine its own destiny, and the NRC has no intention of standing in our way."

He said Entergy in the past agreed to the state's veto power and he does not think it would have any legal leg to stand on if it sought to fight it in court.

Asked if he was worried about "freezing in the dark," if Vermont Yankee shuts down, Shumlin said there is plenty of available power in the New England grid and "we will certainly shine bright lights without Entergy Louisiana."

NRC Officially Issues 20-Year License Renewal To Vermont Yankee (VTPR)

By John Dillon

Vermont Public Radio, March 22, 2011

(Host) Despite opposition from Vermont's congressional delegation, the Nuclear Regulatory Commission has officially issued a new 20 year operating license to Vermont Yankee.

NRC spokesman Neal Sheehan says the application by Entergy Nuclear was thoroughly reviewed.

(Sheehan) "This application has been put under the microscope for more than five years. So we are comfortable at this point issuing the renewed license. And we will now go about the business of ensuring that Entergy lives up to all the commitments it has agreed to under this license extension."

(Host) The NRC voted more than a week ago in favor of a new license for the plant in Vernon.

But the commission's staff delayed the license because of the nuclear crisis that hit Japan following the devastating earthquake and tsunami.

Yankee's reactor shares the same design as the crippled nuclear units in Japan. And many critics urged the NRC to reconsider its decision on Yankee in light of the Japanese catastrophe.

Bob Stannard is a lobbyist with Citizens Action Network, which wants Yankee shut down.

Stannard says the NRC should have followed the lead of Germany, which ordered seven nuclear plants off line while the government reviews safety issues.

(Stannard) "It's unimaginable to think that the NRC would declare this plant safe when this plant houses 640 tons of spent fuel in an unprotected fuel pool with no containment vessel; In Japan, the plant that's in the worst shape has only 80 tons."

(Host) Yankee spokesman Larry Smith says the fuel is stored safely. He says Entergy is pleased by the NRC decision.

(Smith) "And today's action comes after five years of extensive and careful review and confirms that Vermont Yankee is a safe and reliable source of electricity and is capable of operating for another 20 years."

(Host) Yankee's future, however, is still not clear.

Vermont is the only state in the country that allows its Legislature to have a say in nuclear plant operation. Entergy has so far failed to win approval in the Statehouse. And lawmakers say they haven't been persuaded to change course and vote in favor of Yankee.

This is the online edition of VPR News. Text versions of VPR news stories may be updated and they may vary slightly from the broadcast version.

My Turn: Support Yankee's Scheduled Closure (BURFP)

By John Connell

Burlington (VT) Free Press, March 22, 2011

Many people may believe that Entergy's bid for the continued operation of Vermont Yankee died after the resounding defeat in the state Senate last year. However, it is clear that Entergy, the owner of the Vermont Yankee nuclear power plant, does not share this certainty.

Entergy's out-of-state executives are spending boatloads of money on lobbyists in the Vermont Statehouse. They are following up their television advertisements and full-page newspaper ads with a push for a new vote in our Legislature.

I have no idea what stories these lobbyists are spinning for those in the Legislature, but from what I've seen in this newspaper and others, it is apparent that many of their tactics involve fear – that the transmission lines will melt into a gloppy mess, that every business in our state will pack up and move to South Carolina, that our state will enter into a death spiral of unemployment. I also imagine that the well-paid Entergy entourage is continuing to ask the Legislature to pretend that last year's decisive vote was meaningless.

I am certain of one thing: nothing has improved at the plant since the 26-4 vote in the Senate in February 2010. If anything, we have far more information about how poorly the plant is aging. The Fairewinds report, commissioned by the state Legislature, confirms a pattern of deferred and neglected maintenance, a lack of oversight, and the deterioration of key components.

The drumbeat of announcements about radioactive leaks into the groundwater at ever deeper levels and ever wider distribution gives those of us following the Entergy chronicles ever more doubt about the reliability and integrity of the company and the aging reactor. The newest leak, announced in January, is possibly from a completely new and different source than the many other leaks of tritium and other radioactive waste.

The February 2010 Senate vote was the right vote for Vermont. Our elected representatives were speaking for the thousands of citizens who contacted them with one clear message – do the responsible thing. Retire the plant, as scheduled, in March 2012.

Over the past three years dozens of towns have approved resolutions to support retirement of the plant in town meetings across the state. Candidates in the region around Vermont Yankee who openly and strongly support a timely retirement of the plant have repeatedly been elected to office. Vermonters elected a governor in 2010 who campaigned on this issue, and feels strongly that Yankee's time is up.

In town meeting surveys, in independent polling, and in conversations with Vermonters, the result has been the same – the majority of state residents feel that Vermont Yankee is not reliable, safe or the energy source we want for our future. Vermont Yankee is scheduled to retire in less than 14 months. Entergy is using this small window to aggressively lobby legislators instead of planning for the safe clean-up of the reactor site.

Now may be one of the last opportunities for people who want to ensure that this plant really retires in 2012 to be heard. It is again time for citizens to speak the truth about this old nuclear plant.

Contact your legislators. Thank those who voted to retire the plant last year, and express your support for Yankee's planned retirement in March 2012.

John Connell lives in Underhill Center.

Can Vermont Learn From Maine Yankee's Closing? (WCAXTV)

By Kristin Carlson, WCAX News

WCAX-TV Burlington, VT, March 21, 2011

Five hours from home, Marge Kilkelly came to Montpelier from Maine with a message about the impacts of closing a nuclear power plant.

"The whole fabric of the community was impacted by this change. It was very sad and mournful," said Kilkelly, of the Citizens Advisory Panel decommissioning Maine Yankee.

The former Maine senator talked to Vermont senators as Vermont Yankee Nuclear is set to close in a year and lawmakers want to learn about the economic impacts.

"Windham County is going to face similar problems to those in Wiscasset, Maine," said Sen. Peter Galbraith, D-Windham County.

Four years ago, WCAX News traveled up the coast to see Wiscasset and the old nuclear site. Maine officials say not much has changed in those 4 years. Maine Yankee used to provide 90 percent of the town's tax base.

"Basically it's the economics of the town," resident David Nichols told us then.

Current Wiscasset Select Board member Bob Blagden talked to lawmakers by phone, saying the town lost its tax base, had to cut its police force and raise taxes on residents, even as people moved out.

"Most anyone who was of working age and needed to keep working moved because there was not a lot of opportunities in their fields," Blagden said.

Entergy is the company which decommissioned the Maine Yankee plant and owns Vermont Yankee. Maine Yankee decided to close its plant, rather than spend hundreds of millions of dollars in upgrades. The closure was sudden, giving Wiscasset officials little time to prepare... a lesson they hope Vermonters learn from.

"The planning is crucial because with any institution there will come a time when it is not there," Kilkelly said.

"We've had a long and contentious debate about whether it should close or not and that has diverted from thinking about what should happen when it closes... and that's the conversation we need to have," Galbraith said.

Galbraith still supports closing the plant, saying it's old and he worries about safety following events in Japan. Yankee employs about 600 people and Galbraith is among a growing group of lawmakers pushing for state aid to help ease the transition. But some, like Republican State Senator Vince Illuzzi, are starting to reconsider their vote last year, which denied a 20-year license extension for Vermont Yankee.

"If the question is presented again I am going to give serious thought to allowing the plant to be relicensed at least for some period, so we can at least transition to a post Vermont Yankee economy in Windham," said Illuzzi, R-Essex/Orleans Counties.

Senator Illuzzi says that time period should be short – about 5 years – and be an agreement that's made between the state and federal regulators. But one person not reconsidering – Gov. Peter Shumlin. The governor is firm that Yankee was set to operate for 40 years, it has and he says it should be shut down on schedule particularly given recent problems at the plant like tritium leaks and misstatements from company officials.

As for power prices in Maine, when Maine Yankee closed 14 years ago other power sources were cheap and prices did not go up much. But in the end, Maine gets about one-quarter of its power from nuclear; it now just buys it out-of-state.

Vt. House Minority Leader Voices Concern Over Yankee Closure (WCAX)

By WCAX News

WCAX-TV Burlington, VT, March 22, 2011

Burlington, Vermont – March 21, 2011

Vermont Yankee is scheduled to be shut down in exactly one year, but what will come next?

The Vermont Senate voted in 2010 to close the nuclear plant by March 21 of 2012. Proponents point to aging infrastructure and recent tritium leaks as reasons the plant should close. However some lawmakers say they're worried about that deadline, arguing the state has done little to prepare for life without Vermont Yankee.

"I don't know that we've done anything at this point," House Minority Leader Don Turner, R-Milton, told Channel 3. "I don't think Vermonters understand the full financial impact of that facility. We're starting to see it this week. We'll be talking about an energy bill that came out of the House Energy Committee late last week that has a 55-cent increase in rates for all utility users, so that's just the start I think."

The House is also scheduled to begin debate this week on Gov. Peter Shumlin's health care reform plan.

Pilgrim Nuclear Plant Wants To Cut Training Funds (TAUGAZ)

By Vicki-Ann Downing

Taunton (MA) Gazette, March 21, 2011

Four times a year, the Taunton Emergency Management Agency trains about 200 volunteers how to handle people fleeing a potential disaster at the Pilgrim nuclear power plant in Plymouth.

Volunteers learn how to run equipment to check people for radioactive contamination, direct them to showers, dispose of their clothing, get them into white paper suits and give them potassium iodide -- scenes being played out for real every day with the failure of the Fukushima Dai-ichi plant in Japan.

The cost of each training session can run up to \$5,000, which includes the \$15 hourly rate for volunteers and the overtime earned by police officers, said Rick Ferreira, director of the Taunton agency.

Until now, the bill has been footed by Entergy Corp., Pilgrim's parent company, with payments directly to the volunteers.

But the three communities that would act as "reception centers" for people fleeing a disaster in Plymouth -- Taunton, Bridgewater and Braintree -- complain that Entergy wants to reduce the amounts they receive under their contracts and have them use those same funds to pay for volunteer training.

"This isn't an issue that just came up," Ferreira said last week. "This has been going on in discussions for a year now. They are telling us they're going to cut our money back, and we're going to have to pay for the training out of it as well."

David Tarantino, a spokesman for Entergy, said the company is in the process of negotiating new contracts with the three host communities and with the five towns located within 10 miles of the plant -- Plymouth, Carver, Duxbury, Kingston and Marshfield.

Tarantino would not disclose how much the communities now receive from Entergy, a private company.

"We want to be fair. We want to pay the towns what they need," said Tarantino. "But we don't want to pay for things that are not our responsibility."

Asked what kind of items Entergy would not be willing to pay for, Tarantino said, "We have done some audits. We're willing to pay for what is required. We are negotiating. It's never appropriate to negotiate contracts in the (news)paper."

Tarantino said complaints last week from the communities might be a case of "posturing in negotiations."

Ferreira said that in 2000, TEMA received \$114,000 from Entergy to be used toward salaries for himself and an assistant. The amount is now \$108,000, Ferreira said, and Entergy proposes a further cut to \$80,000, with training costs to be taken from that amount.

Ferreira said Entergy is trying to alter agreements that have been in place for 23 years.

Training "is in no way a small effort," said Ferreira. "Without that, there would be no protection and no public safety in a nuclear event."

Bridgewater Town Manager Troy Clarkson said Bridgewater has lost 40 percent of its police force due to budget cuts and needs all the money for training it can get from Entergy.

As "reception centers," Taunton, Bridgewater and Braintree would take in any residents living within 10 miles of the power plant in the event of an evacuation.

Tarantino said about 100,000 people live within 10 miles of Pilgrim. People would be advised to evacuate by the state Department of Public Health, Tarantino said, and it would be unlikely that an evacuation would be advised for everyone within 10 miles.

The Pilgrim plant, which opened in 1972, has been owned by Entergy since 1999. Its application to the Nuclear Regulatory Commission for a 20-year renewal of its license was filed six years ago but has been stalled in hearings. The license expires in 2012.

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New Designs For Nuclear Power Plants Seek To Generate Greater Trust (KCS)

By Steve Everly, Mark Davis

Kansas City Star, March 20, 2011

When President Dwight Eisenhower flipped the switch on the country's first commercial nuclear-fired plant in 1958, he turned on a new source of power that now provides a fifth of our electricity.

In the decades since, nuclear plants around the world, including the two in Missouri and Kansas, were built bigger and better. But their design kept the same potential flaw as that first plant.

They relied on electric pumps to bathe hot fuel rods with cooling water to prevent a dangerous meltdown. And if a power outage knocked out those pumps, backup generators would kick in to get them running again.

If that cooling system failed, watch out.

That's what happened at the Fukushima Dai-ichi Nuclear Power Station in Japan when a huge earthquake knocked out the plant's power and a subsequent tsunami crippled the backup diesel generators.

Is there a better way to build a nuclear plant? Nuclear engineers say there is.

In fact, in a couple of decades commercial nuclear reactors may become so advanced they could be "walk-aways," meaning no one would have to monitor the plants for meltdowns.

But even as debate rages about the future of nuclear energy, a new generation of inherently safer nuclear plants is coming on line now.

The main feature of the new generation is a so-called passive backup cooling system that would keep reactors safe if electricity were cut off. These systems rely on gravity, temperature-sensitive valves and natural convection currents to move water through a reactor.

Although not without its critics, the improved design may have been able to prevent the disaster that beset the Fukushima Dai-ichi plant.

"There's a better design," said Gary Mueller, an associate professor of nuclear engineering at Missouri University of Science and Technology. "If they had a passive system, there wouldn't have been the problems."

Meanwhile, governments around the globe have paused nuclear power programs to re-evaluate where they stand and whether to push forward more quickly with new designs.

Lessons from disaster

Japan's unfolding catastrophe comes at a crucial time for the US nuclear industry, which produces more electricity than any other country, even though a new reactor hasn't gone online since 1996.

The first nuclear plant that Eisenhower inaugurated in Pennsylvania 53 years ago was a prototype, part of a first generation of small plant designs intended to prove nuclear energy could deliver power commercially.

Those few Generation I plants used heat from controlled nuclear reactions to produce steam that drove turbines that made electricity. And they pumped water to keep the reactor cool and safe.

It worked, and dozens of bigger versions followed, using similar power-generation methods and cooling-system designs. But as each plant was built, its design was tweaked by emerging regulations, modified to meet newly discovered operating problems and tailored for the utility that ordered the plant.

The 1979 accident at Three Mile Island — a partial meltdown released some radioactive gas from the reactor in Pennsylvania — changed everything.

It focused regulatory efforts on safety and triggered a wave of retrofitting for older plants and changes in new plant designs. It also opened up the industry — designers and operators began sharing information to run plants more safely and effectively.

The original plants, each of them unique, have been homogenized so that they operate and deploy largely the same safety features.

Three Mile Island gave us our current collection of 104 operating plants that use what the industry considers Generation II designs.

But after boom times that began in the 1970s, the nuclear industry stagnated and is now being slammed by the high cost of the reactors and the low cost of power plants fueled by natural gas. That has made building a nuclear plant uneconomical, even with substantial government subsidies.

Today only one nuclear plant is being built in the country by the Tennessee Valley Authority. Four to six more might be built over the next decade.

China, which heavily subsidizes its nuclear plants, is building 27.

That means the United States can't avoid the nuclear question even if growth in nuclear energy remains sluggish here. We'll still be vulnerable to nuclear accidents elsewhere.

Besides, the country is now counting more on nuclear energy to curb greenhouse gases from fossil fuels that contribute to global warming.

President Barack Obama told the Nuclear Regulatory Commission on Thursday to conduct a "comprehensive review" of the safety of all 104 US nuclear plants but made clear his support of nuclear power.

"Nuclear energy is an important part of our own energy future," the president said.

A spokesman for Missouri Gov. Jay Nixon, who has backed efforts to get site approval for a second nuclear reactor at AmerenUE's nuclear plant southeast of Fulton, Mo., said the permit process would allow plenty of time to examine any risks.

"Missouri needs safe, reliable and affordable energy to meet our future needs," said the spokesman, Sam Murphey. "Construction of a state-of-the-art nuclear plant in Callaway County would provide those benefits for decades to come, in addition to providing thousands of jobs."

Next generation

Efforts to address some of the Generation II design issues began decades ago.

Larry Drbal, chief nuclear engineer for Black & Veatch, an engineering firm in Overland Park, said that in the 1980s utilities began pushing for design changes in new plants.

Current Generation II reactors meet the Nuclear Regulatory Commission's requirement that the chances of a release of radioactivity are no higher than one in a million.

The new breed of Generation III nuclear plants aim to improve on those odds to one in 10 million with more redundant safety systems and the use of passive cooling systems.

Those new designs still operate normally with electric pumps, but the passive systems take over should the normal systems fail.

Some critics have questioned whether these features will work as promised, but Drbal said those familiar with passive cooling systems were confident.

"I think it is a way we need to go," Drbal said.

Black & Veatch is now working on two advanced reactors in Taiwan and is supporting design certification for the new passive-safety nuclear plant from General Electric.

A key advantage of passive systems is that they don't require plant operators to take any action.

"That's the whole point, because we tend to screw things up," said Dan Ingersoll, a senior program manager for Oak Ridge National Laboratory's reactor and nuclear systems division. "That really is the distinguishing feature between Generations II and III."

It's a design philosophy that will give operators more time to react to problems, he added.

For example, designs for Westinghouse's Generation III AP1000 plant place a vast reservoir of water above the reactor. Should the normal system fail, the water begins to fall, cooling the reactor.

There's enough water to cool the reactor for 72 hours, Ingersoll said. That gives plant operators three days to fix the active pump systems or at least refill the reservoir for another 72 hours of safety.

The Generation III rollout also relies on standardized designs so that an AP1000 built here is just like an AP1000 built there. Designs are simpler, leaving fewer things to break or go wrong, and build in more redundancies.

Ingersoll's example: A rod in a passive system is supposed to fall to release water but instead gets stuck. To deal with that, a plant operator can open a manual valve.

The Westinghouse AP1000 has become a popular model for US utilities that would like to build nuclear plants someday and have filed applications with the Nuclear Regulatory Commission.

China plans to build many of them and has substituted AP1000 designs for some of the older Generation II plants that were scheduled.

Other companies offering the newest reactor designs include General Electric and Areva.

Areva is offering a Generation III design that China, Finland and France are each building. It's not yet ready in the United States, where final approvals aren't complete.

Areva's design includes four "trains," which are self-contained safety systems, including backup generators and controls housed in separate buildings that can spring into action if there is a problem.

"So long as one works, you're good," said Finis Southworth, chief technology officer for Areva Inc., the US arm of Paris-based Areva Group.

The plant also offers a passive cooling feature — a second containment vessel around the one that houses the reactor core. Millions of gallons of water are inside the second container. That's enough to dissipate the heat generated from a damaged core.

"Even if you damage the core, it does not damage the barrier of the containment, and it's passive," Southworth said.

Helium and thorium

The rethinking behind Generation III plants pales in comparison to what's under way with Generation IV plants.

Designers have embraced several technologies to make plants that are safer and more economical, reduce waste and prevent formation of material for nuclear weapons.

Some would run at low temperatures and others at high temperatures but still operate more safely.

They're exotic as well. Instead of using water, some cool the nuclear reactions with helium, molten lead or similarly hot fluid salts.

India's next-generation nuclear program is about replacing uranium with thorium as the nuclear fuel. Thorium produces less waste and less weapons-grade material.

These designs are vastly different, because Generation IV expects nuclear plants to do more than create steam to run a turbine.

A higher-temperature plant can use helium to drive gas turbines that are more efficient than the steam ones. High-temperature reactors can be used to turn coal into liquid fuels for home heating or transportation. Generation IV plants also will be called on to produce hydrogen.

Safety, however, remains a driving force behind the advancing designs.

The United States is leading research on designs that get rid of fuel rods and encase nuclear fuel particles inside ceramic coatings and graphite cylinders or spheres to make "pebbles" roughly the size of billiard balls.

"Envision a large gumball machine," said Hans Gougar, deputy technology director of the Very High Temperature Reactor program at the Idaho National Laboratory.

A small reactor in Germany used blowers to circulate helium among the pebbles and used the heated helium to generate electricity. It didn't need a cooling system.

Its design was such that operators could shut down the plant by turning off the blowers.

"It was one of the off switches" operators could use, Gougar said.

The idea is "walk-away safe" plants that don't need active or passive cooling systems to operate or be safe.

South Africa was developing a pebble-bed reactor program since 1999. But after pumping nearly \$1 billion into it over 11 years, the government closed its checkbook a little more than a year ago. And the program hasn't found customers.

Whatever Generation IV designs are adopted, costs will remain a big problem.

Ingersoll, from Oak Ridge, said just building a Generation III design can take 10 years and \$1 billion.

"And that's with familiar technology," he said. "Now you talk about exotic technology ... you're talking about probably double the time and triple the cost."

Moreover, electricity supplied by a nuclear reactor must compete with electricity from power plants fueled by now-cheap and plentiful natural gas.

And that means a nuclear plant must operate for many decades to sell enough kilowatts at market prices to make the upfront investment financially rewarding.

Gougar said the US-backed research into very-high temperature reactors had been scheduled to demonstrate a commercial reactor by 2021. But money hasn't come from Congress on schedule, and now it won't happen before 2030.

"It really comes down to money," Gougar said.

Editorial: Keep Nuclear Part Of Energy Future (MHTR)

Manitowoc (WI) Herald Times Reporter, March 22, 2011

Nuclear safety is on everyone's mind as events play out in Japan, where nuclear plants were damaged or compromised following a devastating earthquake and ensuing tsunami.

We don't know the full extent of the damage there, or its impact on human health or the environment. That will become more clear in the days and weeks ahead.

Manitowoc County has two nuclear reactors – at Point Beach – and another located in neighboring Kewaunee County. Combined, they provide one-fifth of all the electricity used in Wisconsin.

The inevitable question arises: Could what happened in Japan happen here?

The answer is yes. Natural disasters – and their severity – defy even the best the science of prediction has to offer. This was, after all, the largest earthquake ever to strike Japan, and there was no advance warning.

Don't pack up the kids and your belongings just yet, though.

Those in the nuclear industry said reassuring things following the Japan disaster. Viktoria Mitlyng of the US Nuclear Regulatory Commission said the Kewaunee and Point Beach nuclear plants were made to survive the worst natural disasters on record.

Sara Cassidy of the Point Beach plant said the facility's design and maintenance are based on the worst-case seismic scenario for the plant's location.

And Mark Kanz of the Kewaunee nuclear plant said its owner, Dominion Resources, would review all of its safety systems.

They all are comforting, albeit predictable, statements.

In this case, however, we put more stock in the past than in what might happen in a future impossible to predict. The Point Beach and Kewaunee facilities have, for the most part, had clean safety records since going online in the 1970s.

There have been occasional glitches, but they were thoroughly examined by the NRC and corrective measures were taken. None of the instances rose to the level of seriously compromising public safety.

We can be thankful that current and previous management of the local nuclear facilities has been, if not always stellar, at least proficient to the point of keeping the plants operating safely and efficiently.

That says a lot in an industry coming under increasing fire from those who believe the US nuclear footprint should be much smaller, if not eliminated altogether.

President Obama has asked the NRC to conduct a "comprehensive review" of the safety of all 104 US nuclear plants following the disaster in Japan. It's another in a series of predictable responses.

Ongoing review of nuclear safety is, after all, what the NRC does. We hope that those reviews are, indeed, comprehensive. New data from the Japan disaster can prove helpful.

More to the point in the president's recent remarks is this: "Nuclear energy is an important part of our own energy future."

That bodes well for an industry in the midst of battles over plant decommissioning, new and costly rules, and environmental regulations.

We hope that nuclear power, with ongoing and thorough oversight, will continue to be part of the nation's energy landscape for many years to come.

Could It Happen Here? (MORRISDH)

By Jo Ann Hustis

Morris (IL) Daily Herald, March 22, 2011

Nuclear disasters like the potential one unfolding in Japan can be a major concern in areas such as Grundy County, where residents have three generating stations as neighbors.

Especially when the General Electric-designed nuclear reactors at Fukushima Dai-ichi are twins in design to the Mark reactor at Dresden Generating Station at Morris.

Dresden has experienced earthquakes in the past, although not to the magnitude the Fukushima reactors were met with last Friday, when the earthquake there was followed by a tsunami.

"We've had earthquakes before, but we've found no damage to our equipment," Dresden site communications coordinator Bob Osgood noted. "We're operating safely, our neighbors are safe, and these plants are equipped with numerous and redundant safety systems."

Exelon Chairman John Rowe echoed those statements in a press release.

Dresden owner Exelon Nuclear is very closely monitoring the Japanese situation as it continues to unfold. Although there still is much not known about the crisis, the damage so far appears primarily related to the tsunami instead of the earthquake.

"All our plants are designed to American seismic and flood standards," Osgood said. "The rivers flood, and we are prepared for that. The plants are safe, especially given the seismic patterns in the Midwest and absence of tsunami-like events."

Mian Liu is professor of geological sciences at the University of Missouri. He says the Japanese earthquake, which measured 9.0 on the Richter Scale, is entirely different than the earthquakes that have occurred along the state's New Madrid Fault, which extends south from Cairo, Ill.

"Earthquake histories in countries like China, where excellent historic records were kept, indicate that large earthquakes in mid-continent tend to migrate among faults," he said in a news release.

Even the best science and technology cannot predict where and when the next earthquake will occur, he noted, saying that Japan is a world leader in earthquake research with advanced monitoring networks. The Friday earthquake – largest in Japan's recorded history – occurred on the country's northern coast. This is although their earthquake hazard map indicates the southern coast is in the most danger.

"This just shows how much uncertainty goes into our assessment of earthquake hazard," Liu said.

Most areas are potentially susceptible to earthquakes, Region 3 Nuclear Regulatory Commission spokesman Viktoria Mytling of Lisle noted.

"Nuclear plants are built to withstand earthquakes and other natural phenomenon to the highest known level for the area, plus an extra margin," she said Tuesday.

"The plants are built to those standards. The (NRC) periodically re-evaluates this information, and if new information comes to light on seismology, it is reviewed and factored into making sure the plant can operate safely."

Region 3 has had a lot of questions from the public since the Japanese crisis. Many of the questions center around Japan. Others question why people should feel nuclear power plants are safe.

The NRC has calculated the odds of an earthquake causing catastrophic failure to a nuclear plant in the United States.

In information released Wednesday, the NRC noted chances are 1 in 74,716 annually that the core of a typical nuclear reactor in the US could be damaged by an earthquake, exposing the public to radiation. By comparison, chances of winning the \$10,000 Powerball multistate lottery are 1 in 723,145.

There are 104 nuclear power reactors in the United States. The NRC has ranked its estimate of annual risk of an earthquake damaging the core of each reactor and releasing radiation.

Exelon's Dresden Station is 42nd of the 104 places in rank, with the estimated chances for damage to Units 2 and 3 at 1 in 52,632.

Braidwood Generating Station at Braceville is ranked 71st out of 104 places. Damage chances at Units 1 and 2 are estimated a 1 in 136,986.

La Salle Generating Station in Brookfield Township, Marseilles, is in 97th place. The estimate for Units 1 and 2 is 1 in 357,143 chances.

Byron Station at Byron, Ill., is in 81st place, with damage estimates for Units 1 and 2 at 1 in 172,414 chances.

Quad Cities Station at Cordova is in 31st place. The estimates for Units 1 and 2 are 1 in 37,307 chances.

There are also questions whether other parts of the globe will experience atmospheric contamination from the Fukushima Dai-ichi crisis. A couple factors are involved with radiation, Mytling said. One is the amount of radiation being released. The other is the further away a location is from the source of the contamination, the more diluted the radiation becomes.

"Based on the information we have today, there is no indication that any harmful radiation will have impact on the United States, including Hawaii and Alaska," she said.

Paul Gunter is a technical expertise spokesman with Beyond Nuclear at Takoma Park, Md. A non-governmental agency, BN's goal is to educate the public on nuclear power and nuclear weapons, and what Gunter says is the need to abandon both to safeguard the future. The agency is an advocate for an energy future that is sustainable, benign, and democratic.

Gunter believes Dresden's reactors should be taken off line because of their proximity to the area of the New Madrid fault. Also, because of what he said is the bad design of the containment system acknowledged by the former Atomic Energy Commission in the 1970s.

"These are now old plants and vulnerable to natural catastrophe, human error and mechanical failure," Gunter added. "All these are trigger points. The ignition could come in any number of ways, like natural disaster, act of war, and mechanical failure."

This is why Germany is increasing its inspection of the country's older generating stations.

"We're calling on the NRC to immediately shut down the Mark 1 reactors until the Japanese disaster plays out, and we can have a calm look at the fact the Mark 1 is a bad design," Gunter said.

The NRC has not yet responded to his request, he noted.

"I go to bed at night now, thinking about all 23 Mark 1 units in operation in the United States in the context of what's going on in Japan. Dresden Unit 2 came on line in 1970, so it's a year older than the Japanese units. It's bad design, even older than the Japanese design, and the containment is as likely to fail if it's ever challenged by an accident," he said.

"There's many ways an accident can be initiated. We need to always worry about earthquakes and human and mechanical failures. Any of these could be the match that lights the nuclear fuel."

The only relevant protection to radiation is prevention, Gunter said. Radiation will dissipate, he pointed out. However, he called attention to the tremendous amounts of radiation in the six units at the Fukushima plant, and his concern about the impacts of the Japanese crisis on the United States should the plumes reach the Aleutian Islands, Alaska, and the west coast of Canada and the US.

"We're hoping and pulling for those folks to quell the fires of hell in Japan," he said. "I'm in humble awe of all those suffering in Japan now, and how the nuclear issues has compounded their suffering megafold, as if the earthquake and tsunami were not enough."

Calif. Senators Call On Utilities To Delay Nuclear Plant Relicensing For New Seismic Studies (AP)

Associated Press, March 22, 2011

State lawmakers called on California utilities Monday to delay efforts to relicense nuclear power plants until the companies complete detailed seismic maps to get a true picture of the risks posed by earthquakes and tsunamis.

State senators raised sharp questions about whether California's nuclear plants can withstand a major natural disaster such as the one on March 11 that has left Japan scrambling to control radiation coming from some of its reactors.

Lawmakers also questioned whether the utilities have been dragging their feet on conducting three-dimensional seismic studies called for in a 2008 state report to assess the risks posed by offshore faults.

Pacific Gas and Electric Co. has applied to renew its license to operate the two reactors at Diablo Canyon Power Plant near San Luis Obispo, which expire in 2024 and 2025.

"I would ask sincerely that PG&E suspend or withdraw that application" until the additional seismic mapping is completed, said Sen. Sam Blakeslee, R-San Luis Obispo, a geophysicist who has been a frequent critic of Diablo Canyon. He said he would pursue legislation to thwart the utility until the mapping is done.

Blakeslee in 2009 introduced a bill that would have required the utility to meet that and other requirements; it won unanimous support in the Legislature but then-Gov. Arnold Schwarzenegger vetoed it.

Lloyd Cluff, a seismic expert for PG&E, said work started in October for shallow mapping and the utility will apply in April for a permit for deep mapping down to 10 kilometers below the surface.

"We're doing it as we speak," Cluff said.

Edison has applied to the Public Utilities Commission for permission to charge ratepayers an estimated \$21.6 million for similar studies at the San Onofre plant north of San Diego along the Southern California coast, said Caroline McAndrews, director of licensing at the plant.

The license for San Onofre expires in 2022 and Edison has not yet applied to renew it.

California gets a total of about 12 percent of its power from the Diablo Canyon and San Onofre nuclear plants.

Outside the hearing room, Daniel Hirsch, a lecturer in nuclear policy at University of California, Santa Cruz, noted California's reactors are in one of the most seismically active areas of the world after Japan. "What's going on in Japan could happen here," he said.

Japan's plants were not designed to handle the ground movement or wave heights they were subjected to this month, said Steve David, director of site services at Diablo Canyon.

Diablo Canyon and San Onofre have been designed to survive much larger forces, utility representatives testified.

"We've gone back this week and verified that (safety) equipment is in place and that the operators have been trained," David said.

The senators are reviewing whether California's nuclear power plants and natural gas pipelines are safe from earthquakes, as Japan's crisis raises uncomfortable comparisons to the nuclear plants on the US West Coast.

"Japan has always been a leader in preparedness," said Sen. Ellen Corbett, a San Leandro Democrat who chairs the Senate Select Committee on Earthquake and Disaster Preparedness, Response and Recovery.

"It's time to revisit the safety of these plants in light of what we have learned from Japan," Corbett said.

The utilities contend the plants have been designed and located to protect them from the most serious natural threats considered possible at the sites.

For example, Diablo Canyon is anchored in bedrock and has safety systems and emergency reservoirs located at 80 feet or more above sea level. San Onofre is protected by a 30-foot seawall.

Corbett noted that seismic experts have estimated there is a 2 percent to 3 percent chance of a major earthquake in California each year, and a 46 percent chance of a quake with a magnitude of 7.5 or greater within the next 30 years.

The White House last week asked the Nuclear Regulatory Commission to conduct a comprehensive review of safety for all 104 US nuclear plants.

The Union of Concerned Scientists has accused the NRC of lax oversight at some nuclear plants that were subjects of special inspections last year.

At the same time, the Obama administration has been seeking billions of dollars in federal guarantees for the nuclear energy industry, and nuclear power has seen a resurgence of interest as concerns grow about greenhouse gases emitted by burning hydrocarbons such as coal and oil.

Concerns about seismic safety have haunted California's two plants for decades as geologists identified new faults near the generators that could produce earthquakes, and safety problems made headlines.

A 2008 NRC report revealed a battery meant to power safety systems at the San Onofre plant, 70 miles southeast of Los Angeles, had not worked for four years.

The Union of Concerned Scientists report last week noted a finding that emergency cooling-water valves failed in 2009 at the Diablo Canyon plant as a result of repairs that were made to another set of valves 18 months earlier.

Questioned about that incident, David said the problem would have prevented control room operators from activating the valves, but that they would have had more than an hour to activate them from a nearby switchbox or manually.

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Senator Asks PG&E To Suspend License Renewal Request For Diablo Canyon Nuclear Plant (Ventura County Star)

Ventura County Star, March 22, 2011

A state senator on Monday accused the operator of the Diablo Canyon nuclear power plant of operating under "a culture of disregard of risk" and asked Pacific Gas & Electric Co. to suspend or withdraw its application for license renewal until the company has completed advanced seismic studies requested by state regulators three years ago.

Sen. Sam Blakeslee, R-San Luis Obispo, a geophysicist whose district includes the site of the nuclear plant, said PG&E has consistently downplayed the risks associated with the discovery of an offshore earthquake fault line in 2008. That "culture of disregard," he said, "has become endemic at PG&E. It's a culture that puts my constituents at risk."

His remarks came during a special Senate committee hearing designed to examine lessons California might learn from this month's earthquake and tsunami in Japan and the subsequent crisis at a nuclear power plant whose reactors were crippled by the shutdown of essential cooling systems needed to prevent a meltdown.

Lawmakers were told that seismic studies at the sites of both California nuclear plants — the other is at San Onofre, in San Diego County — are insufficient to assess risks associated with geologic data that has become available since the plants were built.

James Boyd, vice chairman of the California Energy Commission, testified that "recent studies have found that ground motion near a fault could be stronger and more variable than previously thought, which could be important at Diablo Canyon, since the offshore Hosgri Fault is 4.5 kilometers west of the plant."

The commission recommended in November 2008 that both plants should use three-dimensional seismic mapping to update their seismic research, but Boyd noted that has not yet been done.

Daniel Hirsch, a lecturer in nuclear policy at UC Santa Cruz, said recent problems at Diablo Canyon, including the fact that emergency cooling pumps had been disabled for 18 months before the problem was discovered, show that safety systems are insufficient.

"I don't believe what happened in Japan is something we're immune to here," he said.

Steve David, PG&E's director of site services at Diablo Canyon, said the company has "large margins for safety" at the plant. He noted the elevations of the plant and all of its safety systems, including diesel-powered generators and their fuel tanks, are much higher than is the case at Japan's Fukushima plant.

The plant, 120 miles north of Ventura, has had a troubled history of dealing with unexpected seismic issues. The Hosgri Fault, capable of producing a 7.5 magnitude quake, was discovered a year after its construction permits were issued in 1970, forcing a redesign that caused construction costs to balloon from the \$320 million estimate to more than \$5 billion.

Later, in 1981, PG&E discovered it had built seismic supports based on a reversed blueprint, requiring another \$2.2 billion in retrofits to correct the mistake.

Then, a little more than two years ago, the US Geological Survey discovered another previously unknown offshore fault, the Shoreline Fault, less than a mile from the plant.

PG&E and the federal Nuclear Regulatory Commission determined the plant's design could withstand an earthquake along that fault. However, Boyd of the state Energy Commission, testified the fault's "major characteristics are largely unknown," including the question of whether an earthquake beginning on one of the offshore faults could continue along the other to produce a larger quake than would be anticipated along either one individually.

The plant is licensed through 2024. PG&E submitted an application to the Nuclear Regulatory Commission in November 2009, seeking a 20-year extension.

Under the commission's rules, Boyd testified, seismic activities are considered not relevant and are "not taken into account in relicensing."

He noted, however, that the recent events in Japan led President Barack Obama and Energy Secretary Steven Chu to request in-depth studies of existing US power plants, which will possibly now mean the advanced seismic studies will be required before the license can be extended.

Blakeslee said if PG&E does not agree to suspend its license application he will seek legislation to try to force it to do so.

Given that the current license is good for another 13 years, he said, "There is more than enough time to address this uncertainty."

PG&E Blasted For 'Disregard Of Risk' At Nuclear Plant (BAYCIT)

By Annette Fuentes

Bay Citizen (CA), March 22, 2011

A nuclear power plant on California's central coast was characterized Monday as a disaster-in-waiting during a state Senate hearing that saw Pacific Gas and Electric Company, the plant's operator, blasted for what lawmakers called a culture that disregards risks.

The waterfront Diablo Canyon nuclear power plant in San Luis Obispo County sits a few hundred yards from a fault line that was discovered in 2008. PG&E is seeking to renew the facility's operating permits without having thoroughly studied the likely impacts of an earthquake along that fault.

Under intense questioning during a Senate informational hearing on earthquake preparedness Monday, PG&E's Geosciences Department Director Lloyd Cluff acknowledged that uncertainties about earthquakes near the facility exist, but said, "We don't see a concern about the uncertainty."

That statement, which Lloyd later tried to clarify by saying that the company's risk models account for uncertainties, made some lawmakers livid.

"I just don't find PG&E truly forthcoming on addressing all of these issues," said Sen. Elaine Alquist (D-Santa Clara), who compared the company's reliance upon "assumptions" about seismic safety at the nuclear power plant with its inability to account for the manufacturing design or operating capacities of the majority of its pre-1970 natural gas transmission pipelines.

Daniel Hirsch, a nuclear policy lecturer at the University of California, Santa Cruz, told lawmakers that PG&E had been successfully resisting efforts to thoroughly study the likely impacts of an earthquake on the facility, which is located 180 miles south of San Jose, since the plant was first proposed in the 1960s.

A nuclear accident at the facility could sicken or kill more than 1 million people, Hirsch testified.

The danger would come from damage not only to the plant's reactors, according to Hirsch, but also to storage facilities that are holding more spent nuclear fuel than they were designed to store.

The waste fuel was planned to be shipped by now to a federal storage facility, but no such facility has been built, according to Hirsch.

NRC Sends Inspectors To Ameren's Callaway Plant (SLPD)

By Jeffrey Tomich

St. Louis Post-Dispatch, March 22, 2011

Federal regulators have begun a special inspection at Ameren Missouri's Callaway nuclear plant after indications that a water pump used to help cool a key plant component in the event of an accident may not work properly.

Nuclear Regulatory Commission inspectors began their work today, and will probe circumstances surrounding an oil sample taken on Feb. 8 that suggested the pump may have been inadequately lubricated.

The oil sample in question was discolored and contained particulate indicating the oil level may have been too low to lubricate the pump bearing, according to the commission.

The auxiliary feedwater pump is used to supply water to the plant's steam generators during some accident conditions, the NRC said.

The NRC decided a special inspection was warranted because of a previous event in 2009 involving inadequate lubrication in the same system.

NRC Inspectors Look At Lubrication Concern At Missouri Nuclear Plant (AP)

Associated Press, March 22, 2011

A Nuclear Regulatory Commission inspection team is at Ameren Corp.

's Callaway nuclear plant near Fulton after concerns were raised about lubrication of an auxiliary feedwater pump.

An Ameren spokesman says the inspection is unrelated to heightened concerns at nuclear plants following the damage to the plant in Japan.

The NRC says an oil sample taken Feb. 8 showed the auxiliary pump might have been inadequately lubricated. The pump is used to supply water to steam generators during some accident conditions.

The oil sample indicated that the oil level may have been too low to properly lubricate the pump bearing. If that happens, the pump may not be able to run long enough during an accident scenario.

The NRC says the inspection was begun because a similar finding occurred at Callaway in 2009.

STP Expansion Slowed Down In Wake Of Japanese Disaster (SAEN)

By Hamilton

San Antonio Express-News, March 22, 2011

Nuclear Innovation North America announced Monday that it is slowing down development of two additional nuclear reactors at the South Texas Project to give federal regulators and others time to assess the state of the industry in the wake of Japan's nuclear disaster.

Work on the proposed new plants will now be limited to licensing and securing the US federal loan guarantee upon which the project depends, according to a release from NINA, the nuclear development company owned by NRG Energy and Toshiba Corp.

In conjunction with that announcement, CPS Energy CEO Doyle Beneby said the utility would indefinitely suspend talks to buy power from the proposed reactors.

"NRG and its partners stand squarely behind new nuclear power as the most important component in our transition to a low-carbon economy," said David Crane, chairman of the board of NINA and CEO of NRG.

"However, our best course of action in this immediate period of uncertainty is to minimize project spend, continue with those activities we can control and wait until there is more information upon which we can base our long-term decisions. This is the financially disciplined course of action in uncertain and challenging times."

The move added a degree of finality to CPS' earlier announcement, on March 14, that the parties had agreed to mutually cease talks as the nuclear crisis in Japan first began to unfold.

The Obama administration recently called for a comprehensive safety review of the US nuclear fleet. Any design or regulatory changes stemming from that review could likely affect the proposed new units.

Crane said that since STP and the stricken plants in Fukushima are very different, it wasn't clear whether modifications would be necessary to the existing or planned units.

"However, as we unreservedly support our government's proposed nuclear safety review, the prudent thing for us to do is to await the outcome of that review before committing more of our own or our partners' capital."

Crane said NRG remains committed to an earlier promise it made to shareholders that it would make a final decision about whether to continue investing in the project by the third quarter of this year.

Before the Japanese crisis, the company was hoping to have enough clarity in four areas to make a decision, Crane said: the status of federal loan guarantees from the Department of Energy, the Nuclear Regulatory Commission's licensing process, an agreed-upon price to build the plant and enough customers committed to buying the power.

"And now we need to have a good idea of who the owners will be," he added.

Tokyo Electric Power Co., or Tepco, which owns the crippled Fukushima plants, had been expected to invest in the expansion; given the company's capital needs in the wake of the disaster, that's now unlikely, Crane said.

But the Japanese government's interest in putting up loan guarantees could still be on the table, he said — though he stressed that NRG has not spoken directly to either the Japanese government or Tepco since the earthquake — since those guarantees would support Toshiba.

"Presumably they would be just as motivated to support Toshiba and its exports, which creates jobs," he said.

Beneby said CPS would continue to pursue other options to replace the 851 megawatts the utility will lose when the Deely coal units at Calaveras Lake are retired, likely by 2018, including "clean coal, natural gas and big solar."

The utility recently released a request for proposals to build an additional 50 megawatt solar installation in the area, and Beneby told environmentalists at their regular quarterly meeting earlier this month that he has begun discussions with solar companies about investing in "big, big solar, maybe a couple hundred megawatts."

Terminating discussions with NRG allows CPS to devote more resources in pursuit of those other options, he said.

He also indicated that the utility would not alter either its current 40 percent ownership in the existing two reactors at STP, or its 7.6 percent stake in the proposed expansion.

After many months of relative silence between the former partners, NRG approached CPS earlier this year about buying more of the output from the proposed plants under a long-term, fixed price contract.

CPS Board of Trustees Chairman Derrick Howard said Beneby's decision is the right one.

"Everybody needs to take a pause," he said. "For a lot of reasons, and for a lot of the right reasons."

Beneby said that if talks do start up again between CPS and NRG, they would start from scratch.

The parties had some initial discussion before Japan began battling to keep its reactors from melting down.

South Texas Nuclear-power Plant Expansion Project Put On Hold (SABIZ)

San Antonio (TX) Business Journal, March 22, 2011

Nuclear Innovation North America LLC is scaling back its expansion plans for the South Texas Project until the US Nuclear Regulatory Commission and other stakeholders can effectively assess the impact of the events in Japan.

Nuclear Innovation North America (or NINA) is the company jointly owned by NRG Energy Inc. and Toshiba Corp. that is developing two nuclear reactors at the South Texas Project near Bay City, Texas.

Given the tragedy of the earthquake and tsunami that struck Japan on March 11, NINA officials will limit work on the South Texas Project expansion to securing a license and a federal loan guarantee for the nuclear project.

Tokyo Electric Power Co. employees in Japan are still working to stabilize the reactors at the Fukushima Daiichi nuclear plant. The outcome of those efforts will likely determine the future of nuclear power development throughout the world.

Executives with NRG Energy, Toshiba and CPS Energy are all watching developments in Japan closely.

"Since STP is very differently situated from the stricken nuclear plant in Japan — 10 miles from the Gulf of Mexico, in a non-seismic area with hardened watertight protection around both its backup generation and its spent fuel storage facilities — it is not obvious to us that any modifications are necessary to regulatory requirements applicable to either our existing or planned nuclear facilities," says David Crane, president and CEO of NRG Energy.

Meanwhile, CPS Energy officials on Monday released a statement that San Antonio's municipally owned utility has decided to suspend discussions indefinitely with NRG Energy with respect to buying additional supplies of nuclear power from the South Texas Project.

"As we have indicated for months now, we are currently pursuing an array of other clean affordable supply options. Terminating discussions with NRG allows us to devote more resources in pursuit of the other options," says CPS Energy President and CEO Doyle Beneby. "When the development of STP 3 and 4 moves forward again, our present ownership interest will remain unchanged."

CPS Energy is not ruling out future discussions with NRG, however.

CPS Energy owns a 40 percent interest in South Texas Project and a 7.625 percent minority ownership in two units that have yet to be constructed.

Arizona Capitol Times » Blog Archive » Arizona Nuclear Power Plant Facing Safety Hearing (AP)

Associated Press, March 22, 2011

The Arizona Corporation Commission will hold a public hearing with operators of the nation's largest nuclear power plant to assess safety procedures in the wake of Japan's nuclear catastrophe.

The triple-reactor Palo Verde Nuclear Generating Station is located in Wintersburg, about 50 miles west of downtown Phoenix.

Palo Verde supplies electricity to about 4 million customers in Arizona, New Mexico, Texas and California.

The Nuclear Regulatory Commission also plans to review the safety procedures at Palo Verde and at other US nuclear plants because of the situation in Japan.

Arizona Corporation commissioner Bob Stump suggested the public hearing and it's been agreed to by the other four commissioners although a date for the session hasn't been set.

Stump sent a letter on Thursday to Arizona Public Service Co.'s Chief Nuclear Officer Randy Edington requesting a briefing on the plant the utility company operates on behalf of six other owners.

"The meeting gives us an opportunity to review them in light of the tragedy in Japan," Stump told The Arizona Republic.

Workers in Japan have been struggling to cool down units at a nuclear-power plant 150 miles north of Tokyo that was damaged by last week's earthquake and tsunami. The units are leaking radiation.

"Some Arizonans have expressed concerns about their health and safety in the event of a disaster, given Palo Verde's proximity to locations where so many people live and work," Stump wrote.

Stump's letter outlines a number of questions he has about the plant's operation, including what safety procedures would be implemented if a natural disaster struck Palo Verde and how often the plant conducts emergency-procedure drills.

Stump also wanted to learn about Palo Verde's backup power systems.

Problems arose at the Dai-ichi plant in Japan after a loss of power prevented its reactors from being safely shut down.

APS spokesman Jim McDonald said the company welcomed the opportunity to discuss plant safety with the commission.

"We want to answer any questions they have and want them to understand our commitment to safety and operational excellence," McDonald said.

Edington recently briefed Arizona legislators on the plant's safety procedures and the differences between Palo Verde and the stricken plant in Japan, according to McDonald.

He said Palo Verde's containment domes that prevent radiation from leaking into the atmosphere are significantly stronger than those at the Japanese plant and the Wintersburg area isn't prone to earthquakes.

"I am a strong proponent of nuclear power and I believe nuclear continues to be an absolutely essential component in a productive and reliable energy portfolio," Stump said. "Yet I believe it is critical that we revisit our own emergency procedures as new information and potential lessons emerge from this heartbreaking disaster in Japan."

Information from: The Arizona Republic, <http://www.azcentral.com>

Arizona Corporation Commission To Get Status Update On Nuclear Industry (PHOBIZ)

Phoenix Business Journal, March 22, 2011

The Arizona Corporation Commission will hold an information status update on the US nuclear industry on Tuesday in response to the ongoing problems at a Japanese nuclear complex.

Commissioners Bob Stump and Paul Newman both asked Arizona Public Service Co. and national officials to present an update in the wake of the accident at the Fukushima Daiichi nuclear power plant.

The Japanese complex has had problems with four of its six reactors — likely a partial meltdown of the fuel, officials have said. Fukushima Daiichi, on Japan's Pacific coast, survived the 9.0-magnitude earthquake, but its backup power generators were flooded out by the massive tsunami that followed. The generators were meant to provide cooling to the nuclear fuel.

APS operates Palo Verde Nuclear Generating Station about 50 miles west of Phoenix and is one of seven utility owners of the power plant. Salt River Project also owns a portion of Palo Verde.

The meeting will begin at 10 a.m.

Spent Nuclear Fuel Storage Comes Under Scrutiny (CHIT)

As plants around the country store their used fuel, experts and nearby residents worry about worst-case scenarios

By Julie Wernau and Lisa Black, Tribune Reporters

Chicago Tribune, March 22, 2011

Fourteen years ago, Zion nuclear power plant's last red-hot fuel rod was lifted from its reactor core and submerged into a pool of water, joining the rest of the plant's 2.2 million pounds of spent fuel. The nuclear waste was supposed to be entombed deep within Nevada's Yucca Mountain.

But the US Energy Department scrapped that plan last year. That left operators of Zion and more than 100 nuclear reactors in the US with the responsibility for storing on site the dangerous spent fuel. Chicago-based Exelon Corp. shuttered Zion in 1998 and another company is dismantling the complex piece by piece. The plan calls for Zion's waste to be encased in concrete-and-steel bunkers not far from Lake Michigan, possibly in perpetuity.

In the wake of Japan's disaster, the safety calculation involved in storing such waste has changed, experts say. More than 80 percent of the spent nuclear fuel in Illinois remains in pools.

In Japan, no one considered the possibility of a 9.0 earthquake and a devastating tsunami. Fuel rods at the crippled reactors have been exposed to air. They are heating up and emitting high levels of radiation, making it difficult for workers to get close enough to cool them. The lesson, experts say, is that nuclear safety seems more designed for most-likely scenarios, not worst-case scenarios.

"This is a once-in-a-millennium event -- but we don't plan for those," Kennette Benedict, executive director and publisher of the Bulletin of the Atomic Scientists said Friday.

In Zion, a town of 25,000 about 50 miles north of Chicago, and at other towns where nuclear waste is stored, Japan's crisis has some questioning if the most unlikely events could happen and whether they would be protected.

In Illinois, 28,588 fuel assemblies, each containing a bundle of 200 rods and weighing about 600 pounds, are cooling in pools on the ground or above reactors as in Japan.

Positioned, up high, they are "very inviting targets for terrorists," said David Lochbaum, director of the Nuclear Safety Project of the Union of Concerned Scientists, and critics note that the buildings that house the pools are flimsy.

"No one has come up with a solution to safely store this waste for 10,000 years into the future," said Lochbaum.

The Energy Department says it is committed to ensuring it meets its long-term disposal obligations, but a plan hasn't been disclosed.

For safety reasons, law requires spent rods to cool in pools for five years before they can be moved into dry casks -- stainless-steel canisters, encased in 3-inch-thick carbon-steel liners and covered in 2 feet of reinforced concrete.

Installing dry-cask storage infrastructure at a plant with two reactors would cost between \$20 million and \$30 million, and annual costs for buying casks, loading them and running a dry-cask storage facility are \$7 million to \$10 million, according to Exelon.

Unlike in Japan, Zion's fuel rods have been cooling for as long as 40 years.

"You can't have a meltdown," said Patrick Daly, general manager of EnergySolutions, which is dismantling Zion.

By 2020, EnergySolutions expects to turn the 240-acre site into an uncontaminated field of grass. Unless the federal government comes up with an alternative, 10 to 15 acres of the land will be home to 61 concrete and steel dry casks, each weighing 125 tons, used to store the spent fuel.

At a panel discussion Friday focused on Japan's crisis and hosted by the Chicago Council on Global Affairs, Robert Gallucci, president of the John D. and Catherine T. MacArthur Foundation, said the concrete monoliths were "a good interim solution" to the storage problem. He said he was a "very enthusiastic supporter of long-term dry storage." Gallucci previously served with the US State Department as a special envoy focused on the threat posed by the proliferation of weapons of mass destruction.

Even Lochbaum calls dry-cask storage "the cheapest insurance we can possibly pay."

So far, none of Zion's waste has been moved into dry casks. This summer a pad is to be built about 2,000 feet from Lake Michigan that would protect the casks from earthquakes.

Daly said spent fuel will be moved into dry casks by 2014. Meanwhile, cooling occurs through natural convection.

The casks are designed to withstand tornados and earthquakes, and are nearly impossible to steal, Daly said. Even if a cask was cracked, hazardous levels of radiation would be contained to the area around the cask because of the age of the fuel rods, he said.

Still, some who live near Zion are concerned about permanent storage of radioactive material in the area.

Roger Whitmore, owner of a Zion automotive store and past president of the Zion Chamber of Commerce said, "If we had a big earthquake or seiche," referring to a large wave from Lake Michigan, "what's (the waste) going to do, sweep into the lake?"

That's unlikely, said Michael Chrzastowski, senior coastal geologist at the Illinois State Geological Survey. Zion is built about 9 feet above the water level of Lake Michigan. The largest seiche -- a wave caused by air pressure and wind -- to hit Lake Michigan was 10 feet, he said. In such a case, he said, the area would only experience "nuisance"-level flooding.

Moreover, the lake side of the storage area is protected by a wall of boulders, he said.

Of more concern, he said, is an area about 2 miles north of the Zion plant, where erosion washes away the shoreline by as much as 10 feet per year.

"Shore erosion needs to be continually monitored along the state park shore and near the power plant," he said.

Daly said they are not monitoring the erosion, but if it became a problem, the company would take care of it.

Tribune reporters Michael Hawthorne and Ameet Sachdev contributed.

Local And State News From Virginia Business (VABIZ)

By Paula C. Squires

Virginia Business, March 22, 2011

There are plenty of lessons to be learned from the near meltdown of Japan's tsunami-wrecked nuclear power plant, but abandoning nuclear power should not be one of them. As Japan continued to struggle to gain control over its plant at Fukushima Daiichi that has been the reaction in Virginia from the halls of Congress, the Virginia governor's office, the state's largest utility and academia.

"It is irrational to rush to judgment and blame the effect of a major natural disaster on an industry which is actually so beneficial to this country and the whole world," said Alireza Haghighat, a professor in Virginia Tech's nuclear engineering program, referring to the catastrophic earthquake and tsunami that struck northeastern Japan on March 9. Instead, he added, the nuclear industry should assist Japan and learn from its experience.

Particularly in a state like Virginia where the nuclear industry has a strong presence, "It is important that the industry maintains its momentum in design, licensing and operation of a new generation of nuclear reactors," said Haghighat, a fellow of the American Nuclear Society and chairman of the board of the Southeast Universities Nuclear Reactors Institute for Science and Education. "Areva NP and B&W should learn from Japanese experience, and if necessary consider changes in their designs."

Paris-based Areva and Charlotte, N.C. -based Babcock & Wilcox have nuclear operations in Lynchburg. Virginia also has two nuclear plants in Louisa and Surry counties. Dominion Virginia Power, which operates the two nuclear plants, has applied to build a third nuclear reactor at its Lake Anna Power Station in Louisa. However, the company needs a partner to help finance the

project. "We don't have an equity partner yet. We want to keep the option open to meet future demand," said company spokesman Jim Norvelle.

Dominion expects the Nuclear Regulatory Commission to rule on its application in 2013. "Then it becomes a business decision, and we'll have to decide if we want to go through with it," Norvelle said.

Frank Settle, a chemistry professor at Washington and Lee University in Lexington, expects the Japanese crisis to weaken funding for new U.S. nuclear plants. "Nuclear power plants are very expensive to build — about \$10 billion a pop. The utilities don't have that kind of capital. So they have to go to the investment community, and the investment community was already a little bit squirrely about taking risks with nuclear power. I think this will make partners hard to come by in this environment."

Virginia Gov. Bob McDonnell doesn't want the state to abandon the construction of new nuclear reactors. McDonnell has pushed to make Virginia the energy capital of the East coast and supports nuclear as a part of the state's overall mix. In an interview with the Washington Post on March 18, he said: "I believe it would be most unwise to let this unprecedented tragedy lead to the retraction or abandonment of the American nuclear energy industry. Nuclear energy is clean, reliable, affordable and critical to generating the volume of electricity we need to power our homes and businesses and grow our economy."

The state's two nuclear plants generate about one third of Virginia's electricity. "They have multiple redundant systems to provide backup electrical power," McDonnell said. "The stations were also analyzed against worst-case acts of nature, such as earthquakes, floods and hurricanes, and modified as necessary to protect them. There are 19 emergency drills scheduled for this year."

President Barack Obama also isn't backing away from his support of nuclear power. However, in response to what happened in Japan with explosions, fires and radiation now being found in the country's food and water supplies, he is asking the NRC to conduct a comprehensive review of the safety of the America's 104 domestic nuclear plants.

While officials debate the safety of nuclear power, some Virginia businesses are assessing what ripple effects might flow from Japan's disaster. In Richmond, specialty insurer Markel Corp. was trying to calculate its earthquake insurance exposure in Japan. Richard R. Whitt III, the company's president and co-chief operating officer, noted that the areas affected were typically rural and residential. "We mostly write commercial insurance," he said. "Obviously we are talking to our brokers and they are talking to the insureds where they can." While information is limited at this time, Whitt has heard projections of insured losses ranging from \$15 billion to \$35 billion.

It's been a busy year for Markel. The insurer had exposure to the Australian floods as well as the earthquake in New Zealand. "Last year was a similar year," Whitt says. "In the first quarter, we had the Chilean earthquake and the earthquake in Haiti. There has been a high frequency of earthquakes in the last year causing large losses of life and economic damage." Four of the five costliest earthquakes and tsunamis in the last 30 years have occurred within the past 13 months, according to the Insurance Information Institute. Before the Japanese earthquake, insured earthquake losses worldwide dating back to February 2010 totaled an estimated \$23 billion.

In another part of the state, Patrick Wales, project manager for Virginia Uranium Inc. in Pittsylvania County, doesn't foresee an immediate impact on the company's plans to mine the undeveloped uranium deposits at Coles Hill near Chatham. The company is awaiting the results of two studies on uranium mining, which will be used by the General Assembly in deciding whether to lift a 29-year mining ban. The studies, one regarding health and safety and the other studying the socio-economic impact, are expected to be completed by Dec. 1. "The next session [of the General Assembly] is the earliest something could happen," said Wales.

The Coles Hill uranium deposit — the largest undeveloped uranium deposit in the US — could be a source for uranium used by nuclear plants. Wales says there is currently a need to increase the mine supply of uranium. "The world currently operates in a 50-million pound deficit; a 180-million pound demand and a 130 million pound primary mine supply. There already exists a need to close that gap regardless if any more nuclear plants are built."

Five groups opposed to lifting the uranium mining ban want Japan's nuclear problems to be considered in one of the studies being conducted by the National Academy of Sciences. In a filing with the NAS, opponents said study committee members should examine whether the nuclear power crisis will depress uranium prices, making the proposed Pittsylvania operation unsustainable after mining has begun.

Virginia Uranium dismissed the filing as a delaying tactic.

More On Nuke Plants' Earthquake Risk (FELS)

By Rusty Dennen

Fredericksburg Free Lance Star, March 22, 2011

As the nuclear disaster in Japan continues, the Nuclear Regulatory Commission put out a Q&A addressing seismic issues at US nuclear power plants. The agency says it does not rank individual plants' risk of damage in an earthquake after an MSNBC story last week used NRC data to compile such a rating. It called the rankings "highly misleading." The MSNBC story listed the North Anna Units 1 and 2 as 7th out of the top 10 plants most likely to have reactor core damage in an earthquake. The topic is of interest here because North Anna Power Station is built in one of Virginia's active earthquake zones. See my most recent stories about North Anna here and here.

Japanese Reactors Are Similar Yet Different From Those In Virginia (NWPRTNWZ)

Newport News (VA) Daily Press, March 22, 2011

An article in last week's Daily Press addressed the likelihood of a commercial nuclear power plant failure in Virginia.

The article, prompted by a tsunami that has wreaked havoc on Japanese nuclear reactors, concluded that anything is possible but a similar event here is unlikely.

It included what, in hindsight, was an oversimplified statement.

The article states while the Japanese reactors are about the same age as the reactors at Surry Power Station, the "similarities end there."

It is true that the General Electric-designed Mark 1 boiling water reactors malfunctioning in Japan are different from the Westinghouse-designed pressurized water reactors at Surry. The containment structures look different, too.

But there are additional similarities. Both type of reactors are powered by enriched uranium, and both rely on large amounts of water and complex electrical systems to prevent the release of dangerous amounts of radiation.

The bottom line remains, however, that the chances of a nuclear accident — comparable to what's happening in Japan — are slim in Virginia.

Cuccinelli to sue EPA?

There were plenty of interesting comments made during last week's Chesapeake Bay hearing on Capitol Hill.

A House Committee on Agriculture subcommittee held the meeting to discuss how the US Environmental Protection Agency's plan to accelerate bay restoration would affect farmers.

Rep. Bob Goodlatte, R-Roanoke, dropped perhaps the biggest jaw-dropper by suggesting that Virginia Attorney Ken Cuccinelli is considering legal action against the EPA.

The possibility of Virginia's hard-charging lawyer suing the EPA to stop what many consider an unfunded federal mandate isn't much of a stretch. Remember, Cuccinelli has filed lawsuits to block federal health care reform and the EPA's effort to curb greenhouse gases.

A Cuccinelli spokesman declined to comment because he had not heard what Goodlatte said. Also, it's the attorney general's policy not to comment on potential litigation, the spokesman said.

If Cuccinelli jumps into the fray, he would join the American Farm Bureau Federation, which earlier this year announced it would fight the EPA in court.

Other groups, including the Hampton Roads Planning District Commission, are considering legal action, too.

NASA can crush

NASA plans to crush a giant-sized aluminum-lithium can Wednesday that the space agency says will aid in future rocket designs.

The test, which NASA Langley Research Center engineers will participate in, will occur at Marshall Space Flight Center in Alabama.

The can is 20-feet tall and 27.5 feet in diameter. It is expected to buckle when researchers subject it to 1 million pounds of force.

It will help engineers design "lightweight, safe, and sturdy structures" for space travel.

Liquor Lobby Tools And Spent Fuel Pools (Journal Inquirer)

By Chris Powell

Journal Inquirer, March 22, 2011

Connecticut's school kids are taught that the three branches of government are the legislative, executive, and judicial. But that's not how it looked at the recent meeting of the General Assembly's General Law Committee.

The big issue before the committee was repealing the ban on selling liquor on Sunday, legislation being advocated by Democratic state Rep. Kathleen M. Tallarita and Republican Sen. John A. Kissel, both from Enfield, whose liquor stores suffer from the Sunday sales ban, what with Massachusetts being next door and allowing its liquor stores to open on Sunday. The only

reason against the repeal bill is the desire of most Connecticut liquor stores to suppress competition. They long have formed an influential special interest, and so theirs is the only product whose sale on Sunday is still prohibited by law.

A Quinnipiac University poll the other day found overwhelming support for repealing the Sunday sales ban, 66 to 31 percent, the biggest margin ever registered on the issue by the poll. But the public seldom acts much on its own opinion. What is deeply felt and acted upon is special-interest opinion. Every legislator's district has a few liquor store operators whose livelihoods depend on using the law to suppress competition, and they have a lobbyist and make themselves heard directly to their legislators, not just to a poll taker on the telephone. So a majority on the General Law Committee didn't want to offend this special interest. Most members wanted the Sunday sales bill to die quietly from the committee's failure to report it favorably, without even a vote. But Senator Kissel meant to put the committee on the record. He sought to attach the bill as an amendment to another bill and then moved for a roll-call vote on the amendment. When that was denied, Kissel moved for a roll-call vote on whether to have a roll-call vote. Only Kissel and Tallarita supported having a roll-call vote on the amendment, and Kissel's motion was defeated 13-2. Most members of the committee were determined to hide from the issue. Subservience to the special interest was that great.

Voting against accountability for themselves and doing the liquor lobby's bidding were Sens. Paul R. Doyle, D-Wethersfield; Carlo Leone, D-Stamford; Kevin D. Witkos, R-Canton; and Anthony J. Musto, D-Trumbull; and Reps. Joseph J. Taborsak, D-Danbury; David A. Baram, D-Bloomfield; Penny Bacchiochi, R-Somers; Rosa C. Rebimbas, R-Naugatuck; Emil Altobello, D-Meriden; Anthony J. D'Amelio, R-Waterbury; Louis P. Esposito Jr., D-West Haven; Sandy H. Nafis, D-Newington; and Frank N. Nicastro, D-Bristol.

Conveniently absent were Reps. William Aman, R-South Windsor; Lonnie Reed, D-Branford; and Hector L. Robles, D-Hartford.

Advocates of repealing the Sunday sales ban may find some other mechanism for raising their bill. In the meantime, the civics curriculum in Connecticut's schools should start teaching that the three branches of government aren't the legislative, executive, and judicial but the teacher unions, the lawyers, and the liquor stores.

* * *

Responding to the nuclear power disaster in Japan, President Obama says he has ordered a "comprehensive review" of nuclear power plant safety in the United States. Maybe the president has noticed that the Japanese disaster involves the cooling pools of spent nuclear fuel rods -- rods that will keep piling up at US nuclear power plants because the Obama administration has canceled the long-delayed plans to build a federal nuclear waste warehouse underground at Yucca Mountain in the Nevada desert.

It's not that such a warehouse suddenly wasn't needed anymore. It's that the federal government has never been able to summon the political courage to tell little Nevada, mostly wasteland owned by the federal government itself, that the national interest sometimes must take precedence over the wishes of the few.

At a hearing of the House Energy and Commerce Committee the other day, US Rep. John Shimkus, R-Ill., reminded Energy Secretary Steven Chu that there are 11 nuclear plant spent fuel pools within 40 miles of downtown Chicago.

There's also a big spent fuel pool at the Millstone nuclear power complex in Waterford, by far the biggest environmental hazard in Connecticut.

Every nuclear plant will always need such a pool for cooling spent fuel rods until they can be transported for permanent storage. But the federal government's negligence has turned these pools into permanent storage themselves, often in densely populated areas. No more studies are needed to know that the country will be safer when its nuclear waste is in a wasteland.

Constellation: Lessons From Japan Will Make A Safe US Nuclear Industry Safer (BSUN)

By Brew Barron

Baltimore Sun, March 21, 2011

As a leading producer of safe, reliable and economical electricity from nuclear energy in Maryland and New York, we take seriously our role to communicate about how the Japan situation impacts our industry and energy facilities.

We at Constellation Energy Nuclear Group LLC (CENG) extend our sincere sympathies to those suffering due to the tragic earthquake and tsunami. Our hearts are with those in Japan and those who have family and friends in the region. Our stakeholders (Constellation Energy and the EDF Group) are providing financial donations, and the world's nuclear industry is providing supplies and technical and humanitarian support.

Thanks to the heroic efforts of the plant employees and emergency response workers at Fukushima Daiichi, we understand conditions at all six of the reactors have significantly improved. As of this writing on Monday, the primary reactor containment

structures of each of the three reactors that were in operation at the time of the tsunami were all reported to be intact. We also understand that radiation levels both on and off-site have been decreasing.

Nuclear energy is our nation's current largest source of low-carbon electricity and is a significant producer of 24/7 electricity. It helps preserve our Earth's climate, avoiding ground-level ozone formation and acid rain. The 104 US reactors produce about 20 percent of our country's electricity, with safety and environmental stewardship as our goals.

I have worked in the nuclear energy industry for four decades. Safety is our passion. Nothing comes before the protection of our employees and communities. Our industry's highest commitments are safety and continuous improvement. CENG employees live by these overriding principles, and as a result, our nuclear power plants are safe.

After the Sept. 11 terrorist attacks, all US nuclear energy facilities underwent comprehensive reviews. The objective of these safety and security assessments was to evaluate severe scenarios that are beyond existing regulatory requirements to identify extraordinary and additional protective measures that assure US plants can withstand extreme events.

We have invested millions of dollars into CENG's Calvert Cliffs facility in Maryland and the Ginna and Nine Mile Point sites in New York to make them even more secure and safe.

We agree that a fresh review of the industry, with a focus on protective actions in the event of unusual natural events, is appropriate. We are a business built on a foundation of continuous learning and reaching new levels of operational excellence.

Lessons will be learned from the events in Japan, but we are not waiting to begin to take action. All US companies with nuclear power plants are already verifying their capability to maintain safety even in the face of severe challenges, including natural disasters. Our CENG sites are designed, built and maintained to sustain severe man-made and natural disasters. We also have multiple safety and security features and redundant backup systems.

An integral part of our safety commitment is to keep the public and government officials fully informed in the unlikely event of an accident impacting any facility. We routinely conduct intense training exercises and drills to test our ability to effectively implement our emergency response plans with local, state and federal government officials as well as with the media. The Nuclear Regulatory Commission independently measures our performance in these areas, and the Federal Emergency Management Agency evaluates the state and local responses to those scenarios.

CENG's roots are deep in the communities we serve. We operate with the community's consent and value our strong partnerships with local, state, regional and national leaders and organizations.

We feel fortunate to operate our business and employ thousands of outstanding people in Maryland and New York. Our dedicated employees are committed to performing work at the highest levels of safety and operational excellence in producing electricity for millions of homes and businesses.

Rest assured, we will maintain our unwavering commitment to safety and our staunch support for the continuous application of lessons learned.

Brew Barron is president and CEO of Baltimore-based Constellation Energy Nuclear Group. His e-mail is brew.barron@cengllc.com.

Environmental Groups Say Cuomo Administration Should Address Safety Concerns At Upstate Nuclear Facilities (2011-03-21) (WRVO)

By Michael Benjamin

WRVO-Radio, March 22, 2011

In the wake of the nuclear crisis in Japan, Lieutenant Governor Robert Duffy is meeting with Nuclear Regulatory Commission officials tomorrow to discuss concerns over the safety of the Indian Point nuclear power plant near New York City.

A number of environmental advocacy groups are sending a letter to Governor Andrew Cuomo, urging his administration to go further and discuss concerns at all the state's nuclear facilities, including the three in Oswego County (Nine Mile Point 1, Nine Mile Point 2, and FitzPatrick) and one in Wayne County (Ginna).

Laura Haight is an environmental expert with the New York Public Interest Research Group (NYPIRG). She says there are significant concerns at the Central and Western New York plants as well.

"Oswego ranks fourth in the nation for the amount of high-level radioactive waste - spent fuel rods - stored on site," Haight says, "so there's a lot of issues at that site which, quite frankly, I don't think people are aware of."

Two of the plants in Oswego County (Nine Mile Point 1 and FitzPatrick) also have the same model boiling water reactor and containment design as the Fukushima plant in Japan that experienced a near-meltdown after the earthquake and tsunami that hit that country recently. Haight says the plants in Oswego County are about as far from Albany as the Fukushima plant is from Tokyo, where officials have noted higher levels of radiation after the crisis at Fukushima.

Exelon Faces Regulatory Fallout After Japanese Nuclear Disaster (CRCHIBIZ)

By Steve Daniels

Crain's Chicago Business, March 22, 2011

Exelon Corp.'s nuclear power plants are an ocean and half-a-continent from the crippled reactors in Japan, but fallout from the still-unfolding disaster is headed straight for the company.

The biggest nuclear plant operator in the United States, Chicago-based Exelon will bear the full force of an expected crackdown by regulators spurred to action by uncontrolled radiation releases across the Pacific. Already, President Barack Obama has ordered a full-scale review of nuclear power plants in this country, and Illinois Gov. Pat Quinn is considering raising fees on Exelon's six power stations in the state.

"I just see lots of red tape and regulatory scrutiny" for Exelon and other nuclear power companies, says Hugh Wynne, a utility analyst at Sanford C. Bernstein & Co. LLC in New York.

It couldn't come at a worse time for Exelon, which is scrambling to avert a profit slide next year and revive its languishing stock.

CEO John Rowe's growth plans hinge on adding power to its 10 nukes and buying more via an acquisition. But he said last week that Exelon is reconsidering a \$3.8-billion capacity expansion in response to the crisis in Japan. Analysts believe the disaster also derails any near-term acquisition plans Exelon might have.

Now the company must play defense as regulators tighten enforcement of existing rules and lawmakers propose new ones, in a process likely to add costs and hinder growth. Exelon's stock, already trading at about half its level of three years ago, fell 7.3% last week to \$40.03.

Mr. Rowe told Bloomberg News last week that he expected the Nuclear Regulatory Commission to perform special safety reviews of all the nation's nukes—something Mr. Obama later ordered.

SIMILAR REACTORS

A quarter of the nuclear power Exelon generates comes from 30-plus-year-old reactors that, like the Japanese plant damaged by a devastating March 11 earthquake and tsunami, were built by General Electric Co. and are of the same type and vintage. Those include four reactors at two Illinois plants, the Quad Cities facility and the Dresden facility in Morris.

"Our management believes they're safe; I believe they're safe," Mr. Rowe said last week.

Depending on what those regulatory reviews turn up, costs to Exelon could range from modest to substantial.

Improvements to backup power systems might be expected in the wake of their failure in Japan, but costs of that sort would be on the lower end, experts say.

Bigger-ticket upgrades could include shoring up pools where spent fuel rods are stored at the plant sites, says Eric Beaumont, an analyst at Chicago-based investment firm Copia Capital LLC and a former nuclear safety analyst at Exelon's Commonwealth Edison Co. Those could run in the tens of millions of dollars per plant, he says.

Of course, if the Japanese containment vessels fail, prompting the NRC to seek major upgrades of US plant vessels, then costs could skyrocket. But Mr. Beaumont considers that unlikely, noting US containment vessels from 1960s- and 1970s-vintage plants were bolstered in the "80s.

As for its capacity-expansion program, which Exelon has said would produce up to 1,500 megawatts of additional power, or the equivalent of a new reactor, Mr. Rowe said, "I believe we will be able to add some capacity to our different plants. We will, of course, give that a fresh look in the wake of this event."

An Exelon spokeswoman says the company still intends to make \$475 million in capacity upgrades budgeted for this year. That's primarily for "turbine replacements" that are part of long-term maintenance plans at the plants, she says.

The NRC must approve plant changes to add capacity, which will presumably fall under sharper scrutiny, too.

'PRESS THE PAUSE BUTTON'

"These nuclear plants were believed to have operating lives of about 40 years," says Howard Learner, executive director of the Environmental Law and Policy Center in Chicago and a frequent Exelon critic. "Exelon has run the plants really hard. . . . It is wise and prudent to press the pause button" on the expansion plans.

Among the plants Exelon is targeting for major upgrades: the LaSalle station in Marseilles, where it plans to boost capacity by 16% within five years. Less-ambitious upgrades are planned for the Quad Cities, Dresden, Braidwood and Byron plants in Illinois.

The spokeswoman says the upgrade program is intact but could change if economic or regulatory conditions warrant.

The disaster in Japan also complicates Mr. Rowe's acquisition plans. Regulators could demand expensive plant upgrades as a condition of approving any deal. Likewise, acquisition targets must consider the state of Exelon's nukes when deciding whether to accept the company's stock in any transaction.

"Until we know what the NRC wants, it's going to make due diligence a nightmare," Bernstein's Mr. Wynne says. The Exelon spokeswoman declines to discuss the possible impact of regulatory changes on deal-making.

Florida Utility To Buy Into Future S.C. Nuclear Plants (MYRTLE)

By Warren L. Wise

Myrtle Beach Sun News, March 22, 2011

A Florida utility plans to buy into Santee Cooper's share of two new nuclear units to be built north of Columbia amid the uncertainties for the industry following the disaster in Japan.

Santee Cooper said Monday it has signed a letter of intent to negotiate a purchase power agreement with Orlando Utilities Commission for a portion of the state-owned company's stake in the planned \$10 billion new reactors at V.C. Summer Nuclear Generating Station in Fairfield County.

The Florida company also could buy part of Santee Cooper's ownership in the joint venture.

Santee Cooper owns 45 percent of the V.C. Summer expansion. Cayce-based South Carolina Electric & Gas Co. owns 55 percent. The two new nuclear units are projected to come online in 2016 and 2019.

The letter of intent with the Florida utility is for 5 percent to 10 percent of the capacity and output from Santee Cooper's interest in the new units. The letter of intent also includes as part of the potential transaction an option for Orlando Utilities Commission to acquire a portion of Santee Cooper's ownership stake.

"We are hoping to wrap things up by late summer or early fall," Santee Cooper spokeswoman Mollie Gore said of the Florida utility deal.

Orlando Utilities Commission's pending deal with Santee Cooper has been in the works for several months, OUC spokesman Tim Trudell said.

He could not say whether discussions were held internally to rethink the proposal after the 9.0-magnitude earthquake and tsunami in Japan on March 11 that crippled several nuclear reactors and spewed radiation.

"OUC continues to work toward diversifying its generation portfolio, and nuclear plays an important role moving forward," Trudell said. "The letter of intent demonstrates OUC's interest in the V.C. Summer project and confidence in its partners."

Orlando Utilities Commission, Florida's second-largest municipal utility, has about a 4 percent ownership in two nuclear facilities - Crystal River and St. Lucie - on opposite sides of Florida, Trudell said.

Santee Cooper wants to cut its ownership in the V.C. Summer nuclear expansion project to 20 percent and is looking for one or more partners to pick up 25 percent of its interest.

Last year, Santee Cooper started to re-evaluate the need to invest in new power plants after its biggest customer, Central Electric Power Cooperative, announced it would shift 1,000 megawatts of its load to Duke Energy beginning in 2013.

Central Electric's decision, combined with reduced demand because of the recession and the prospect of new federal regulations for coal-fired plants, forced the Moncks Corner-based utility to halt its three-year drive to build a \$1.2 billion generator near Florence in 2009.

Gore said the Florida deal does not preclude bringing other investors on board.

"We are continuing to review our level of participation," she said. "We are motivated by making sure what is best for our customers and meeting our needs."

She deferred questions about the future of new nuclear generation in light of the problems encountered in Japan to SCE&G, which is leading the licensing process for the new nuclear units.

SCE&G spokesman Eric Boomhower said Santee Cooper's pending deal with the Florida utility would not have any effect on the management, construction or operation of the two new units.

Preliminary construction of roads, grading and support facilities is under way at the Jenkinsville facility, but work on the two new nuclear reactors awaits approval of the Nuclear Regulatory Commission, which is expected later this year or early next year, Boomhower said.

SCE&G officials said last week they are forging ahead with plans for the new nuclear units because their design and the geography are different from that in Japan.

"We remain committed to our new nuclear generation strategy and our intent is to remain on schedule," said Kevin Marsh, president and chief operating officer at Scana Corp., SCE&G's parent company.

NextEra CEO Says Nuclear Plants Well-prepared For Disasters (PALMBEACHP)

By Susan Salisbury

Palm Beach Post (FL), March 22, 2011

WEST PALM BEACH — NextEra Energy Inc., the Juno Beach-based parent company of Florida Power & Light Co., is a major producer of the power source that has been thrust to the front and center since the catastrophe in Japan.

In fact, it's the nation's third-largest owner and operator of nuclear power plants, NextEra Energy Inc. CEO and Chairman Lewis Hay said Monday. He has been chief executive officer since 2001 and chairman since 2002.

"We were quite happy with that until the events in Japan a little over a week ago. We still are happy, not to belabor that, but it has definitely been something that has caught our interest," Hay told more than 300 people at a Palm Beach County Business Development Board and Economic Council luncheon.

Although the crisis is still unfolding, the focus is on getting the nuclear reactors at Japan's Fukushima Daiichi plant to a safe situation, Hay said.

"The nuclear industry is a unique industry. We all pull together and help one another out," he said.

When any type of problem occurs at a nuclear plant, the industry works to solve it. Later, whatever lessons are learned are incorporated into operating procedures and plant design, Hay said.

"I can assure you that will happen again following this event," Hay said.

He outlined several differences between the company's Florida nuclear plants and the Fukushima plant.

FPL's plants have pressurized water reactors, while the plant in Japan has boiling water reactors.

"The containment structure, the concrete that surrounds the plants here, is far more robust than what you have in Japan," Hay said.

In addition, the plants here have more redundant backups in their ability to cool the reactors.

After the terrorist attacks of Sept. 11, 2001, the company and regulators realized the potential terrorist threats and prepared for a worst-case scenario.

"We have all sorts of pumps and hoses and pipes and procedures. We drill our people on a very regular basis deploying this type of equipment.

"Rest assured, we have everything we need to cool those reactors down," Hay said.

If a hurricane is approaching, the company shuts its nuclear plants down well in advance of winds in excess of 75 mph, Hay said.

He provided an overview of NextEra's operations, stressing the size of the company, which is ranked 147 on the Fortune 500 list.

NextEra and its subsidiaries, FPL and NextEra Energy Resources, rank second in the nation in terms of generating capacity with 42,588 megawatts. By the end of this year, Hay said he expects the company to be No. 1.

While the nation has an estimated 300-year supply of natural gas, the sources of energy it uses should be diverse, said Hay, who would like to see more solar plants built.

Proposed federal legislation dealing with climate change has gone off center stage for now, but it will be back, he predicted.

The Clean Air Act, passed in 1990, has been in litigation for almost 20 years, and Hay disagrees it will be burdensome and tax the economy.

"I don't think it's going to be the train wreck that some people are saying it will be," Hay said.

Nine Mile Point Unit 1 Taken Offline For Scheduled Refueling (SPS)

By Debra J. Groom

Syracuse Post Standard, March 22, 2011

Scriba, NY — Nine Mile Point Unit 1 nuclear plant has been shut down for scheduled refueling and maintenance, said Jill Lyon, speaking for Constellation Nuclear Energy Group, the plant's owner.

Lyon said the plant is taken offline every 24 months to refuel the reactor and perform normal maintenance work and inspections. Items such as motors, valves and seals are checked and fixed if needed.

UPDATE 1-Constellation Shuts NY Nine Mile 1 Reactor To Refuel (REU)

By Soma Das

Reuters, March 22, 2011

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

Judge Dismisses Oswego School District Challenge Of Nuke Plant Tax Agreement (SPS)

By Debra J. Groom

Syracuse Post Standard, March 22, 2011

Oswego, NY – The petition filed by the Oswego school district challenging the tax agreement with Nine Mile Point Unit I has been dismissed in state Supreme Court.

In a ruling dated Friday, Justice Hugh Gilbert dismissed the school district's petition stating it should not have been filed as a challenge to the assessment set by the Scriba Board of Assessment Review.

He said the assessment only can be challenged in a tax grievance petition. But then he also ruled the school district cannot use this procedure to challenge the assessment because only the property owner can file a tax grievance.

Lawyer Paul Sheppard, of Binghamton, who represents the school district, said the district has to decide whether to appeal the decision.

"It is my understanding the district has not made a determination on this," Sheppard said Monday afternoon.

School district Superintendent William Crist also would not comment on the ruling. "We just received it from our attorney and until our attorney and the board goes over it, there will be no comment from the district."

Listed as defendants in the school district's suit were the town of Scriba, Oswego County, Scriba's Board of Assessment Review, the town's assessors, Constellation Nuclear Energy Group and Nine Mile Point Nuclear Station.

The school district began the legal challenge in August after the Scriba Board of Assessment Review assessed Nine Mile Unit I at \$280 million for school tax purposes. The town of Scriba, Oswego County and the district had negotiated a tax agreement with the plant's owners, Constellation Nuclear Energy Group, but only Scriba and the county approved it.

The school board thought the plant should be assessed for \$600 million, the value set by George Sansoucy LLC, of New Hampshire, a firm that specializes in appraising nuclear plants.

With the \$280 million assessment, the school district was to receive about \$6 million for 2010-11, about \$4 million more than it received in the nuclear plant's former payment in lieu of taxes agreement for 2009-10.

Lawyer Kevin Caraccioli, who represents the town of Scriba, said if no appeal is filed or if an appeal is denied, town, county and school district personnel again can sit down with Constellation officials to negotiate a tax agreement for Nine Mile Unit I and Unit II. Unit I's PILOT expired in December while Unit II's PILOT expires in December 2011.

"I am pleased with Justice Gilbert's decision," said Scriba Supervisor Kenneth Burdick. "I always felt that the actions of the Town of Scriba were justified. This decision confirms my belief. I hope the parties can get back to negotiating a comprehensive agreement that will benefit the entire community."

Lawsuit Dismissed Against Constellation Energy Group (YNN)

YNN News, March 22, 2011

OSWEGO, N.Y. – The State Supreme Court dismisses a civil lawsuit filed by the Oswego City School District. The lawsuit was filed against the Town of Scriba, the County of Oswego, and the owners of the Nine Mile Point Unit One nuclear power plant.

It stems from the proposed nuclear plant tax agreement with Constellation Energy Group. Earlier this year, Constellation Energy agreed to nearly triple its tax payments for one year but the school board felt that the deal did not reflect current tax rates. So they rejected the plan.

The district filed the suit in late July asking for the 2010 assessment tax roll to be reviewed for Nine Mile Point and corrected. However that appears unlikely to happen as a judge ruled against the schools, dismissing their case.

Conn. Lawmakers Consider Tax On Electricity Generators As Critics Cite Rising Cost Of Power (AP)

Associated Press, March 22, 2011

HARTFORD, Conn. — Connecticut lawmakers are set to vote on a new tax on generators of electricity to provide relief for ratepayers and raise revenue.

The legislature's Energy and Technology Committee is scheduled to meet Tuesday to consider the bill, which would impose a tax on generators that use oil, coal and nuclear power. The state Office of Consumer Counsel says the tax would raise \$340 million in revenue, with \$332 million from Connecticut's Millstone nuclear plants.

Energy provider Dominion Resources, which operates the plants in southeastern Connecticut, says the tax will raise prices for consumers. Richmond-based company also says the measure is discriminatory because it is applied to only a few energy sources.

Individuals and businesses have complained that prices have risen dramatically since Connecticut deregulated electricity in 1998. They have pressured lawmakers to find ways to cut costs.

Several Obama Cabinet Secretaries Also In Latin America (WP)

By Ed O'Keefe

Washington Post, March 22, 2011

President Obama waves from Air Force One as he arrives in Brazilia on Saturday. (Jason Reed/Reuters) President Obama and the first family aren't the only ones taking in the sights and pressing the flesh this week in Latin America.

Eight Cabinet secretaries and top officials from other agencies are along for the ride, according to a list provided by the White House.

The sight of Cabinet secretaries traveling with the president while abroad is nothing new — Treasury Secretary Timothy Geithner, Secretary of State Hillary Rodham Clinton and others have accompanied Obama to summits and other appearances all over the world.

But the current five-day trip through Brazil, Chile and El Salvador includes some interesting traveling companions. Take a look:

IN BRAZIL:

- Treasury Secretary Timothy Geithner: Attended bilateral meetings with Brazilian officials, a formal lunch hosted by Brazilian President Dilma Rousseff, and a meeting with US and Brazilian CEOs where Obama spoke.

- Commerce Secretary Gary Locke: Attended the bilateral meetings, hosted the CEO meeting and also attended Rousseff's formal lunch.

- US Trade Representative Ron Kirk: Attended the bilateral meetings, the CEO meeting and the formal lunch.

- Export-Import Bank Chairman Fred Hochberg: Attended the bilateral meetings, the CEO meeting and the formal lunch.

- EPA Administrator Lisa Jackson: Attended the CEO meetings and the formal lunch.

(Energy Secretary Steven Chu was also scheduled for the trip, but canceled to focus on the US response to the Japanese earthquake, according to the White House. Interior Secretary Ken Salazar is also scheduled to visit Brazil in the coming weeks to follow up on energy-related topics discussed during Obama's trip.)

IN CHILE:

Kirk will attend bilateral meetings with Chilean officials.

IN EL SALVADOR:

- Labor Secretary Hilda Solis: Scheduled to attend bilateral meetings with Salvadoran officials and a formal dinner meeting session. (Solis is the first Hispanic woman to serve in the US Cabinet. Her mother is from Nicaragua.)

- USAID Administrator Rajiv Shah: Scheduled to attend the bilateral meetings and the dinner meeting.

- Peace Corps Director Aaron S. Williams: Also scheduled to attend the bilateral meetings and the dinner meeting.

Was NRC's Decision To Close Yucca Legal? (EED)

By Hannah Northey

E&E Daily, March 18, 2011

The chairman of a House Energy and Commerce subcommittee is challenging whether the Nuclear Regulatory Commission had the legal authority to suspend a safety review of Yucca Mountain in Nevada as a permanent spent nuclear fuel repository.

Rep. John Shimkus (R-Ill.) warned NRC Chairman Gregory Jaczko during a budgetary hearing Wednesday that "you better be double checking your facts" on whether the move was legal.

Shimkus, who heads the Environment and the Economy subpanel, said it is "a stated federal position by law that Yucca Mountain should be open, that's the legal authority; there's no legal authority to close Yucca Mountain."

The repository has gained increasing attention in past days as lawmakers and regulators scrutinize the safety of on-site storage of spent fuel at utilities across the nation. Jaczko yesterday said spent fuel pools at the Japanese Fukushima Daiichi nuclear plant could be without water, creating a dangerous situation for spent fuel rods that could ignite and emit radioactive elements.

Democrats are pushing for the permanent closure of the site. Rep. Shelley Berkley (D) of Nevada said yesterday that in light of the nuclear crisis in Japan, it is hard to believe anyone would argue that "it's a good idea to unleash decades of nuclear waste shipments on communities across the US incapable of dealing with the death and environmental destruction that a disaster involving this radioactive garbage is capable of inflicting."

After the Obama administration decided to stop support for the project, the Department of Energy last year submitted a filing with NRC to pull its application to develop the site in Nevada.

But NRC's Atomic Safety and Licensing Board ruled that DOE could not pull its application to construct a permanent nuclear waste repository in Yucca Mountain. The board said that unless Congress directed otherwise, DOE could not "single-handedly" derail the legislative process and questioned whether the department acted because the site was unsafe or simply because it was a "matter of policy" (E&ENews PM, June 29, 2010).

DOE appealed the board's decision to the five-member NRC. Jaczko said at Wednesday's hearing that the commission has not yet come to a final determination on whether it will let the board's decision stand.

But Jaczko last October ordered a closeout of a staff review of DOE's application, in accordance with NRC's budget request for fiscal 2011. Consequently, there was \$10 million in NRC's 2011 budget for closing out the program, and no money requested for Yucca Mountain in the agency's fiscal 2012 budget, the commission said. NRC is now gathering information it has collected for a technical evaluation that will be made public but will not include regulatory conclusions.

Shimkus joined the ranks of many Republicans in accusing Jaczko of delaying NRC's final vote — in light of the fact the opinions already had been formed and circulated — and questioning the chairman's legal authority to close out the review of the project.

Jaczko said he made the decision to close out the review and that "my legal authority was as chairman of the commission."

DOE is already facing legal challenges from Washington state, South Carolina and other plaintiffs that filed a lawsuit in the US Circuit Court of Appeals last year, charging that the Obama administration overstepped its authority in attempting to shut down the project. The opening arguments will be heard next week (E&E Daily, March 16).

In addition to challenging the legality of DOE's decision to withdraw its application under the Nuclear Waste Policy Act, parties to the lawsuit argue that the decision to end the NRC staff review of the Yucca Mountain project was based on "inside baseball" and that the chairman moved ahead without a decision by the full commission.

The National Association of Regulatory Utility Commissioners also joined the lawsuit against the DOE. Association spokesman Rob Thormeyer said the group is "crystal clear" on the law barring DOE's filing to withdrawal its application.

"We think the oral argument is really going to be a slam dunk because they haven't followed the letter of the law," he said.

NRC and DOE have said they will not challenge the court's decision.

Yucca Has Allies, Even As Japan Suffers (LVS)

Catastrophe shows risk of storing nuclear waste

By Brian Greenspun

Las Vegas Sun, March 21, 2011

We are constantly reminded of Mother Nature's cruel bent: Hurricanes named Andrew and Katrina and now, earthquakes and tsunamis in Japan that have culminated in, as I write this, untold thousands of deaths, many times more injuries, hundreds of billions of dollars in destruction and, perhaps worse yet, a nuclear meltdown.

That's why it should give Nevadans pause when we hear Republicans in Congress threaten to reopen Yucca Mountain.

This is not a political column. Rather, it is an attempt to separate the politics of money from the policies of good government and sane stewardship of the environment and the right of the people to live secure in the belief that their government is not going to do them in.

The Las Vegas Sun, more than any other media organization in this state and, for a period of time the only medium to do so in Nevada, has been railing against the thought of using Yucca Mountain as the dumping ground for the nation's high-level nuclear waste for almost 30 years. In the early days we were alone in warning about the accidents that were inevitable. The political reality decades ago — little or no competent representation in Washington — allowed Nevadans to be set upon by larger states that didn't want the deadliest substances known to man to rest, uncomfortably, in their backyards. We were singled out for special treatment by the nuclear power industry, its desire for riches at our expense and its lackeys in Congress only too happy to shove that stuff down our underrepresented throats.

It took Nevada's senior US senator, Harry Reid, together with President Barack Obama, to finally drive a stake through the heart of the radioactive beast that threatened our lives and livelihoods. But, just like the vampires of old and new movies, that beast just doesn't want to stay dead.

Instead, the nuclear power industry in this country, working through its minions in the GOP-controlled House of Representatives, is doing its best to breathe life back into the moribund Yucca Mountain. Fighting to revive the dumpsite is just one of the consequences of the last election.

What is interesting, though, is that the reasons given for the resurrection: Nuclear waste disposal in Nevada is safe, and we don't want to happen here what just happened in Japan. That's what is coming out of Washington these days despite

indisputable evidence to the contrary. It makes you wonder what planet these folks in Washington think Nevadans are living on! We may vote for crazy people from time to time, but that doesn't mean that we are.

At the heart of the Yucca Mountain debate is this: The federal government and the Yucca support staff always believed it was responsible, reasonable and desirable to build a nuclear waste dump in the middle of the third most active earthquake zone in the country. And, deep geologic burial would take place in one of the most porous mountains around — that means water flows from its top through the nuke canisters, corroding them on the way through, and then into the water table below — and you have the makings of an environmental disaster.

Cutting through the miles of paperwork defending the decision of politicians almost 30 years ago, the truth remains that Yucca Mountain is the wrong place for the dump. And, knowing what we know today, it is highly likely that burial is the wrong answer to the question of what to do with the most poisonous substances known to man.

So, what can we learn from the tragedy unfolding in Japan?

Assuming the worst hasn't happened by the time this goes to print, the threat of and, hopefully, the avoidance of a nuclear meltdown are both the most horrific consequence of man's arrogance and the luckiest of outcomes for people who depend on government and industry to keep them safe.

Assuming it gets worse? Just further proof of how wrong we can be.

Inherent in the Yucca Mountain argument, as I am certain it was in the Japanese decision to place nuclear power generating plants at the water's edge — let's not even talk about California's decision to build nuclear plants on fault lines throughout the state — is the belief that science can engineer around any potential challenges.

Those who argue to open Yucca Mountain have to believe that drip shields — which do not exist today — can be built to keep water out of the mountain and away from canisters holding nuclear waste for thousands of years. They have to believe that canisters — which do not exist today — can be built of sufficient strength and durability to keep that garbage out of the environment regardless of what natural or unnatural calamity should occur. And they have to believe that thousands of trucks and trainloads of radioactive waste can be safely transported across the country, through towns and cities, without a hint of an accident. Once they get all that down, they have to believe that an earthquake will not happen over the next thousands of years, causing all the deadly garbage to drop into the water table that nourishes much of the Southwest, including Las Vegas!

That is a lot to believe, especially in light of what the Japanese people had to believe to build the nuclear plants where and how they did.

First, they had to believe the plants could withstand an earthquake. It appears they mostly did. Then they had to believe they could survive a resulting tsunami that would devastate the region and cause all kinds of power outages. Or they had to gloss over that risk and assume it would never happen. Then they had to believe that the fail-safe programs at the plants, the backup generators and cooling systems that were designed by top-notch engineers, and the simple things, such as electrical connections, would all work flawlessly.

I am not picking on the Japanese thought process or the people — if anything, we have to admire their discipline and heroic selflessness as they try to prevent an even worse disaster — for thinking the way they did. If they didn't rationalize those problems away, they could never have built those plants the way they did.

But I do take issue with any American lawmaker who believes that the problems inherent in Yucca Mountain can or should be rationalized away on the altar of engineering solutions and current science. We have living — and dying — proof that that kind of thinking just doesn't work.

The Japanese people fooled with Mother Nature and lost big time when she decided to throw a few curveballs their way. The best engineering and scientific minds on the planet were no match for Mother Nature once she decided to show us her stuff.

What makes anyone in this country think we know more or know better than the Japanese? What makes anyone think earthquakes and truck accidents and terrorist missiles and just plain, old stupid mistakes will not happen over the next few thousand years, potentially unleashing thousands of tons of high-level radioactive poison on the lives of Americans who expect their government to protect them, not destroy them? With so many lives in the balance, what makes us believe we should fool with Mother Nature?

EDITORIAL: Obama's Nuclear Negligence (WT)

Toying with waste storage exposes America to Japan-type disaster

By The Washington Times

Washington Times, March 22, 2011

The ongoing crisis at Japan's damaged nuclear power plants raises the issue of whether our own radioactive materials are vulnerable to similar catastrophes. The states of South Carolina and Washington will argue today before the US Court of Appeals

for the District of Columbia that the Obama administration had no authority to order the closing of the Yucca Mountain disposal facility in Nevada. That project's purpose had been to move American plants away from the radioactive waste-storage model used in the land of the rising sun.

The worst of the radiation from the Fukushima Dai-ichi facility is not emanating from the reactor cores, but from pools where spent nuclear fuel rods are stored. Most spent fuel in the United States is stored in the same fashion or in dry casks located on-site at the nation's 104 nuclear power facilities. Those were meant to be temporary depots that would be emptied when what was supposed to be the permanent storage site, Yucca Mountain, was completed. Instead, President Obama, with the strong encouragement of Nevada's Democratic Sen. Harry Reid, has spent the past two years dumping obstacles in the path of the facility's opening.

Even a left-leaning state like Washington is upset by this last-minute "not in my backyard" maneuver. The Evergreen State has been counting on the new repository to accept its 53 million gallons of high-level radioactive waste now stored at the Department of Energy's 586-square-mile Hanford facility in the southeastern corner of the state. That was the reason behind Uncle Sam's spending \$12 billion to construct a vitrification plant at Hanford, which will convert radioactive sludge into glass logs specifically designed to fit into Yucca Mountain's storage vaults. If the repository is abandoned, Washington state contends, the expensive plant would be for naught and the Hanford site would be back to square one with no permanent nuclear storage solution.

President Obama fulfilled a campaign promise to his radical supporters by zeroing out funding for Yucca Mountain in his fiscal 2011 budget last year. Then his energy secretary, Steven Chu, tasked nuclear energy backers with finding a different disposal solution. A Chu-appointed blue-ribbon panel is halfway through a two-year search for an alternative, but it is unlikely to yield results because the findings must pass muster with an anti-nuke left.

The O Force is pursuing an unrealistic energy policy that is free of nuclear power and anything that emits carbon dioxide. Hampering domestic nuclear power by exacerbating the spent-fuel dilemma and oil production by bans on drilling, the administration is counting on utopian energy sources that stop working when the day is calm or night arrives. The thought of wind- and solar-powering the future may fuel the dreams of greens -- and fill the pocket of Mr. Obama's friends -- but neither can actually power a modern society.

Congress enacted a law that spent billions to build the Yucca Mountain project. The president cannot, on his own, ignore that statute. In light of Japan's recent tragedy, lawmakers ought to persuade the administration to reconsider its position on nuclear waste disposal.

Appeals Court To Hear Yucca Arguments (AUGC)

By Rob Pavey

Augusta Chronicle, March 22, 2011

Oral arguments in a lawsuit aimed at forcing the government to complete the Yucca Mountain nuclear waste repository will be heard today in the Washington, D.C., Circuit Court of Appeals.

"In this case, existing law is very clear that Congress has mandated that the nation's high level nuclear waste shall be stored at the Yucca Mountain facility in Nevada," said communications director Mark Plowden, of the South Carolina Attorney General's Office. "All of the states are in agreement, with the exception of Nevada."

The Yucca Mountain project near Las Vegas was being designed to accommodate 70,000 tons of waste from the nation's 104 commercial reactors -- including those at Plant Vogtle in Georgia -- which are generating about 2,000 tons of spent fuel each year. It was also to be the disposal site for radioactive material from 121 temporary sites, including Savannah River Site.

The project was halted more than a year ago when US Energy Secretary Steven Chu announced he would create a panel to explore other options. He established the 15-member Blue Ribbon Commission on America's Nuclear Future to explore safe, effective nuclear waste alternatives.

The Court of Appeals will hear arguments that the law requires the Yucca Mountain facility to be completed and that the administration must follow the dictates of Congress, Plowden said.

South Carolina and Aiken County brought the original jurisdiction petition, as did the state of Washington, and three of its citizens. Ken Woodington is representing South Carolina. Tom Gottshall is representing Aiken.

Getting Rid Of Spent Nuclear Power Fuel (CHIT)

Dennis Byrne

Chicago Tribune, March 22, 2011

So, what are we supposed to do with spent nuclear power fuel? Rocket it into outer space?

Thanks to Sen. Harry Reid, D-Nev., Democratic Presidents Bill Clinton and Barack Obama and anti-nuke champions, tens of thousands of tons of dangerously radioactive fuel rods have been "temporarily" stored for up to 60 years on American nuclear power sites, many in Illinois. Many are stored like those in pools of water that are threatening to go dry at the damaged nuclear reactors in Japan.

Engineers and scientists say the spent fuel could pose a greater danger than a meltdown of the core reactors. Common sense and science dictate that spent fuel should be stored far away from the power plant, someplace permanent that wouldn't magnify the consequences of a catastrophic accident.

Why aren't they? Politics.

Scientific studies concluded that the best burial site is under Yucca Mountain in the Nevada desert. Congress approved and required ComEd and other nuclear power customers to pay into the Nuclear Waste Fund to finance disposal. So far, we have coughed up more than \$35 billion, of which \$11 billion or so has been swallowed up by Yucca Mountain.

The site was to begin accepting the material in 1998, but Clinton and then Obama, caving in to parochial interests and anti-nuke zealots, threw up years of roadblocks. (President George W. Bush supported Yucca Mountain as the nation's first long-term underground site for high-level radioactive waste.) Reid proudly pronounced the project dead last month as Obama zeroed it out in his 2012 budget. The president also formed a blue-ribbon commission to study — again — the best alternative for the nation's nuclear future, including disposal of the waste.

But no more studies are needed. There's a technology, called the Integral Fast Reactor, that could produce abundant, safe, environmentally friendly and less expensive nuclear power. IFR supporters said it would provide an inexhaustible and domestic fuel supply, while solving the spent-fuel problem.

Argonne National Laboratory, whose baby it was, demonstrated at its Idaho reactor development facility that the technology could safely shut down power plants in both the Chernobyl- and Three Mile Island-type accidents.

The key was a new metallic fuel alloy that could be cleaned and used again and again in the reactor. Charles Till, former director of civilian nuclear power development at Argonne, said the technology, using a common metal refining process, would extend fuel supplies more than a hundred-fold, while slashing the volume and lifetime of the radioactive waste. As a bonus, the fuel had no weapons value.

Despite IFR's promise, the newly elected Clinton and his energy secretary, Hazel O'Leary, with the support of Sen. John Kerry, D-Mass., successfully torpedoed the program. Illinois Democrats — the then-Rep. Dick Durbin and Sens. Carol Moseley Braun and Paul Simon — cognizant of IFR's jobs, first supported the project, but later joined other Democrats to cancel funding. They were for it before they were against it.

As if the matter hadn't been studied enough: In 2001 the Department of Energy launched yet another study to evaluate the 19 best reactor designs on 27 different criteria. Guess which was ranked best? The IFR.

Obviously, the IFR would not have solved the spent-fuel problems in the old reactors revealed by Japan's troubles. So, back to the original question: What do we do with the spent fuel? In the face of the gross politicization of the project and three wasted decades, the Nuclear Energy Institute, an industry group, proposed the creation of a self-sustaining, quasi-government corporation to administer the fund and manage the program. And 64 House Republicans have endorsed legislation that would, while re-energizing nuclear construction, reopen the Yucca Mountain option.

Exelon Corp., which operates nuclear reactors here and elsewhere, says that it can safely shut down its reactors in emergencies, and that its sites have sufficient "portable, high-capacity pumps to ensure the pools remain filled" with water to keep the rods cool. The anti-nuke crowd obviously doesn't agree, having challenged in court a recent Nuclear Regulatory Commission finding that, in effect, concluded that on-site storage is safe, for now.

We can't go back more than a half-century to pretend that nuclear power plants weren't built. Even though the anti-nuke coalition of Democrats, liberals and environmentalists seems to think so. If they weren't living in such a dream world, maybe they would have come up with a better solution.

Dennis Byrne, a Chicago-area writer, blogs at the Barbershop at ChicagoNow.

Radiation Worrying You? Take A Vitamin (DISC)

By Irene Klotz

Discovery Channel, March 22, 2011

To mitigate the effects of radiation on astronauts, doctors advise a simple measure: Take a vitamin pill.

Along with the anti-radiation drug potassium iodide, scientists recommend a vitamin pill to plug any nutritional deficiencies in the Recommended Dietary Allowance, a standard established by the US National Academy Sciences in 1941.

"There are ways to greatly modify the radiation response," Ann Kennedy, head of the NASA-backed National Space Biomedical Research Institute's Radiation Effects Team, told Discovery News.

"(Vitamin) deficiencies appear to be extremely important in determining radiation effects and basically determining the incidences of many, many, many chronic diseases, which would include cancer and cataracts," said Kennedy, a radiation oncology professor at the University of Pennsylvania School of Medicine.

"It used to be viewed by the AMA (American Medical Association) that a good diet containing all the usual levels of RDAs of things was enough and you really didn't need a vitamin pill," she added. "Well, they've basically reversed themselves over the past several years and are making the statement that every American should be taking a daily vitamin pill for the prevention of chronic diseases – and that includes cancer."

"I've certainly recommended that for people on the space station, as well as anyone else at NASA that's flying and has a very high occupational radiation exposure and I would certainly recommend that for all those in Japan exposed to higher than normal doses of radiation," she said. "I think it's just as important for them to be getting a vitamin tablet every day as it is to be taking potassium iodide."

If the radiation exposure levels of workers battling Japan's crippled nuclear reactors are correct, the amount rivals what astronauts traveling beyond the protective bubble of Earth's magnetic field would receive, though the types of radiation are different.

"Workers now at the plant – (who) are apparently receiving high doses of radiation and they are not very well protected – could be in a similar range (of exposure) to those that an astronaut will encounter during a solar particle event (solar storm)," said Marcelo Vazquez, who previously oversaw research at the NASA Space Radiation Laboratory at Brookhaven.

"The quality of radiation is quite different," Vazquez, now an independent consultant, told Discovery News. "But those workers are apparently close to suffering acute radiation effects."

With the long-term goal of sending humans beyond the space station, which orbits about 220 miles above the planet, NASA has been working on understanding how radiation affects the human body and what can be done to prevent, restrict and reverse its damage. Potential drugs and protocols, including extracts of blueberries and strawberries, are being studied.

"Anything that can be learned from the research can be applicable to Earth conditions, like what's actually happening in Japan right now," Vazquez said.

10 Things You Didn't Know About The Nuclear Regulatory Commission (USNEWS)

By Caitlin Huey

US News and World Report, March 22, 2011

1. The Nuclear Regulatory Commission was established by the Energy Reorganization Act of 1974. The commission absorbed the regulatory powers of what had been the unsuccessful and highly criticized Atomic Energy Commission.
2. The NRC began operation on Jan. 19, 1975.
3. The commission is designed to be an independent regulator of nuclear material and nuclear power used commercially.
4. On March 28, 1979, an incident at the Three Mile Island power plant in Pennsylvania caused about half of the reactor core in one unit to melt. It was deemed the worst nuclear power accident in the United States.
5. The NRC is made up of five commissioners, nominated by the president and confirmed by the Senate to serve staggered five-year terms. No more than three commissioners can be from the same political party.
6. The president selects one commissioner to serve as chairman and official spokesperson. The current chairman is Gregory Jaczko.
7. The NRC has inspectors assigned to 65 nuclear power plant sites and three fuel facilities.
8. The NRC's budget for the 2010 fiscal year was \$1.07 billion, over three quarters of which was spent to ensure the safety of nuclear reactors.
9. The NRC does not have the authority to regulate nuclear weapons or lobby for nuclear power.
10. In March 2011, after a tsunami triggered nuclear power plant explosions in Japan, the NRC dispatched experts to provide advice and assistance in the effort to shut down the reactors. The agency is also monitoring events from its headquarters.

INTERNATIONAL NUCLEAR NEWS:

Japan's Catastrophe Resonates At Economic, Regulatory And Personal Levels (WP)

By David Nakamura And Joel Achenbach

Washington Post, March 22, 2011

TOKYO — Japan's catastrophe is resonating around the planet.

As technicians continued to struggle Monday to control a smoke-belching nuclear power plant in Japan, workers at a General Motors engine-manufacturing facility in Buffalo, N.Y., learned that they would be laid off temporarily as the shortage of Japanese-made parts roils the US auto industry.

In Rockville, the US Nuclear Regulatory Commission opened hearings on the safety of the country's 104 nuclear reactors, many of them long in the tooth and now undergoing a critical reexamination.

And in Richmond, a family mourned. The US Embassy in Japan informed the parents of Taylor Anderson, a 24-year-old American who had been teaching at a school in Japan, that her body had been identified in tsunami-battered Miyagi prefecture. Anderson reportedly helped parents pick up their children after the earthquake before she rode her bicycle home.

"Fittingly, she was last seen helping parents safely reunite with their children following the earthquake, an act which illustrates her dedication to her students and to the Japanese people she served," Virginia Gov. Robert F. Mc-Don-nell (R) said.

Japan, the world's third-largest economy, will face five years of rebuilding from the disaster, which could cost the nation up to \$235 billion, according to the World Bank. By comparison, Hurricane Katrina caused \$81.2 billion in damage in 2005, according to a widely cited study by the National Hurricane Center. Last year, the costs of natural disasters soared to a worldwide total of \$109 billion, three times the total in 2009, according to the United Nations.

What makes Japan's crisis so anguishing is the nuclear emergency that drags on day after day despite the efforts of hundreds of workers who are putting themselves in the line of atomic fire at the quake-crippled Fukushima Daiichi power plant. The situation there continues to be two steps forward and one step back.

Emergency workers lost precious hours Monday in their ongoing battle to get the six-reactor complex under control when smoke billowed from two of the reactor units. The first cloud was spotted just before 4 p.m. coming out of the building that houses the unit 3 reactor. It tapered off after two hours. But then another cloud rose 20 minutes later near the unit 2 reactor.

No one was hurt, and the incidents were not as alarming as three previous explosions that damaged buildings housing reactors. But radiation levels spiked briefly, and the Tokyo Electric Power Co. (Tepco) chose to evacuate about 700 workers.

"If we find the levels of radioactivity go down, we'll go back to work," Hidehiko Nishiyama, deputy director general of Japan's Nuclear and Industrial Safety Agency, said at a news conference Monday night at the prime minister's office in Tokyo.

Tepco managed to restore electricity from the power grid to the unit 2 reactor, though it did not activate the damaged cooling systems and is taking measured steps to avoid making the situation worse.

The nuclear drama has drawn the attention of regulators around the world. At the Rockville hearing Monday, William Borchardt, the NRC's executive director for operations, said the situation in Japan appeared to be stabilizing.

"The fact that off-site power is close to being available for use of plant equipment is perhaps the first optimistic sign that things could be turning around," Borchardt said. "I would say optimistically things appear to be on the verge of stabilizing."

Nothing that regulators have learned about the Japanese catastrophe indicated that any changes were warranted at US nuclear plants, Borchardt said.

"We have found no reason to take any immediate regulatory action," he said.

The commission will vote on a plan to conduct a 90-day study of the implications of the Japanese situation for the United States.

"We have a responsibility to the American people to undertake a systematic and methodical review of the safety of our own domestic nuclear facilities in light of the natural disaster and the resulting nuclear emergency in Japan," said NRC Chairman Gregory B. Jaczko.

So far, 8,649 people have died and 13,262 are missing since the 9.0-magnitude quake struck off the coast near Sendai, Japan's National Police Agency said. Nearly 350,000 others have been placed in shelters across the region and as far away as Tokyo.

(PHOTOS: Massive rescue, cleanup efforts underway in Japan)

Martin Faller, head of the East Asia delegation of the International Red Cross, said Monday that fuel is scarce and many people are suffering in the cold weather. Food has become more plentiful, but many elderly people are running low on medicine.

"It was really cold in the operation shelters, logistics had broken down, fuel and kerosene were difficult to get," Faller said in an interview.

Government authorities said they have banned the sale of raw milk and spinach from several prefectures after they were found to contain excessive levels of radiation. The officials said the amounts still did not pose a threat to people's health if

consumed. Government scientists are now examining fish and shellfish, said Yoshifumi Kaji, director of the inspection and safety division of the Ministry of Health, Labor and Welfare.

The ministry called on local governments Monday to advise residents to stop giving babies water in forms such as baby formula if radioactive iodine is found at elevated levels in drinking water, the Kyodo news service reported.

"Babies can easily absorb radioactive iodine in their thyroid glands," the agency quoted a ministry official as saying.

Greater amounts of radioactive iodine and cesium were found in rain, dust and particles in the air in some areas over a 24-hour period starting Sunday morning because of rainfall, the agency reported.

New Repairs Delay Work At Nuclear Plant In Japan (NYT)

By Ken Belson, Hiroko Tabuchi And David Jolly

New York Times, March 22, 2011

TOKYO — Efforts to stabilize the crippled nuclear power plant in Fukushima stalled on Monday when engineers found that crucial machinery at one reactor required repair, a process that will take two to three days, government officials said.

A team of workers trying to repair another reactor, No. 3, was evacuated in the afternoon after gray smoke rose from it, said Tetsuro Fukuyama, the deputy chief cabinet secretary of the Japanese government. But no explosion was heard and the emission ended by 6 p.m., NHK, the national broadcaster, said.

Separately, NHK cited the Japanese Nuclear and Industrial Safety Agency as saying that white smoke was coming from the building housing Reactor No. 2, where repairs to machinery were needed. Mr. Fukuyama said significantly higher radiation had not been detected around the two reactors.

An official at the United States Nuclear Regulatory Commission said on Monday that Reactors No. 1 and No. 2 were both too damaged for cooling systems to restart immediately, even when electricity was restored. But the official, William Borchardt, also said that the situation at the plant appeared to be "on the verge of stabilizing." The N.R.C. is advising the United States Embassy, giving assistance to the Japanese and gathering information to benefit American reactor safety.

The State Department, meanwhile, said it would offer potassium iodide to its staff members and dependents in the Tokyo region and to the north on Honshu, Japan's main island and the site of the troubled power station, as a precaution against a possible radiation release. In a travel warning posted online, the State Department advised against taking the chemical compound "at this time" and urged consultation with the United States government before consuming it.

Potassium iodide can help prevent thyroid cancer by reducing the chance that radioactive iodine will be absorbed by the thyroid gland.

Hundreds of employees of the Tokyo Electric Power Company, which owns the disabled Fukushima Daiichi Nuclear Power Station, worked through the weekend to connect a mile-long high-voltage transmission line to the No. 2 unit in hopes of restarting a cooling system that would help bring down the temperature in the reactor and spent fuel pool.

After connecting the transmission line on Sunday, engineers found on Monday that they still did not have enough power to fully run the systems that control the temperature and pressure in the building that houses the reactor, officials from the Japanese nuclear safety agency said.

Engineers were also trying to repair the ventilation system in the control room used to monitor conditions in the No. 1 and No. 2 units. When that work is completed, the power company can begin cleansing the air in the control room so workers can eventually re-enter and begin using equipment inside to monitor conditions in the two reactor units.

Workers at the plant were also trying to connect a separate power cable to Reactor No. 4.

Firefighters from Tokyo doused Reactor No. 3 overnight, and fire trucks from the Japan Self-Defense Forces and the American Army spent two hours on Monday morning spraying water on Reactor No. 4. There are six reactors at the plant; Nos. 4, 5 and 6 were offline when the earthquake and tsunami hit, but there are spent fuel rods atop them and the other three.

The Japanese nuclear safety agency said that some of the water used to douse the damaged reactors had reached the ocean nearby, and that officials were investigating radiation levels in the water. Trace amounts of radioactive material were also reported to have been found on Hokkaido, Japan's northernmost island.

Separately, residents of Iitate, a village about 30 miles from the Fukushima Daiichi plant, were ordered not to drink tap water after high levels of radioactive elements were detected in the water supply, said Takashi Hashiguchi, a Health Ministry official. Residents were told that they could still use tap water for other tasks, like washing their hands or taking a bath, he said.

The order came a day after the government barred all shipments of milk from Fukushima Prefecture and shipments of spinach from Ibaraki Prefecture after finding new cases of above-normal levels of radioactive elements in milk and several crops.

Abnormal levels were also found in spinach from Tochigi and Gunma Prefectures to the west, in canola from Gunma Prefecture and in chrysanthemum greens from Chiba Prefecture, south of Ibaraki.

A spokesman for the World Health Organization said on Monday that the discovery of radiation in food was a more serious problem than the organization first expected, Reuters reported. Peter Cordingley, a Manila-based spokesman for the organization, said there was no evidence that contaminated food from Fukushima Prefecture had reached the export market.

But Mr. Cordingley added that "it's a lot more serious than anybody thought in the early days when we thought that this kind of problem can be limited to 20 to 30 kilometers" from the power plant, according to Reuters.

In Vienna on Monday the United Nations atomic energy chief said the nuclear crisis in Japan remained "very serious."

In a statement, Yukiya Amano, director general of the International Atomic Energy Agency, said he believed "this crisis will be effectively overcome." He also said that "the agency's role in nuclear safety may need to be re-examined, along with the role of our safety standards" and that "it is already clear that arrangements for putting international nuclear experts in touch with each other quickly during a crisis need to be improved."

The food contamination and delays in repair work at the Fukushima plant are two of the challenges facing Japan since a 9.0-magnitude earthquake and subsequent tsunami struck its northeast coast on March 11. Rescue teams on Monday were still searching through communities devastated by the tsunami.

NHK said Monday that the official death toll had been raised to more than 8,600. But the final toll is expected to reach nearly 20,000. On Sunday police officials in Miyagi, the prefecture hit hardest by the tsunami, said they expected the toll there alone to exceed 15,000.

More than 13,000 people are listed as missing.

The World Bank, meanwhile, citing private and Japanese government estimates, said that the cost of the disaster could range from \$122 billion to \$235 billion, or 2.5 percent to 4 percent of gross domestic product, and that it would hurt Japan's growth at least through midyear.

Smoke Plumes Set Back Japan's Efforts To Contain Nuclear Crisis (LAT)

The evacuation of repair crews at the damaged Fukushima plant stalls efforts to restore cooling systems. Four prefectures are ordered to halt milk and spinach and other vegetable shipments after radiation is detected.

By Don Lee, Victoria Kim And John M. Glionna, Los Angeles Times, March 22, 2011

Los Angeles Times, March 22, 2011

Japan's battle to control the damaged nuclear power plant in Fukushima suffered a setback Monday after plumes of smoke rising from two of the six reactor buildings forced an evacuation of repair crews and stalled operations to restore vital cooling systems.

It was unclear early Tuesday what had produced the smoke, which came from the structures housing reactors No. 2 and 3. But some Japanese scientists said the problems didn't appear to signal a deteriorating situation at Fukushima, where workers had been making progress in the painstaking work to contain the nuclear crisis.

Still, the unexplained black and gray plume, and a temporary increase in radiation levels around the plant on Monday, underscored the still precarious scene at the Fukushima Daiichi nuclear facility, where the March 11 Tohoku earthquake and tsunami knocked out the plant's outside power and emergency cooling systems, causing a leak of radiation from multiple sources.

The interruption delayed by a day efforts to restore power to the cooling systems at the plant. The smoke also caused fire officials to halt the spraying of water onto the reactors.

The snag came on a day when the executive director of the US Nuclear Regulatory Commission, Bill Borchardt, said that the agency's staff in Japan reported that the three reactors probably had suffered core damage but did not appear to be leaking significant amounts of radiation.

"I say optimistically that things appear to be on the verge of stabilizing," Borchardt said.

In Japan and abroad, however, concerns over radiation fallout grew. On Monday, Japanese officials said they detected higher than normal radiation levels in samples of seawater around the power complex. And residents of at least one village near the nuclear plant were ordered not to drink tap water.

Japanese authorities Monday also ordered farmers in Fukushima prefecture to halt shipments of milk. And three other nearby prefectures, along with Fukushima, were told to stop shipping spinach and some other vegetables after traces of the radioactive isotopes Iodine 131 and Cesium 137 were found in batches from regions surrounding the plant.

World health officials warned of potential dangers posed by the tainted food. In a sign of the potential problem for Japan's food exports and international image, one Japanese restaurant in Taiwan was reportedly providing radiation gauges with its meals.

World Health Organization officials advised people living near the plant who may have consumed tainted produce or animal products to seek medical attention.

Neighboring nations have increased scrutiny of produce coming from Japan. The governments of China, South Korea and the Philippines have ordered screening of imports from Japan for radiation contamination.

Many Japanese in the tsunami zone, meanwhile, were still experiencing acute shortages of food and gasoline, which caused long lines and shorter tempers.

Many restaurants in the northeastern portion of the country were printing abbreviated menus of five or six dishes. Convenience stores were running out of food and at several locations lines stretched around the block with people seeking such staples as water and rice.

But perhaps the lingering gasoline shortage presented the toughest challenge on Day 10 of the multi-fronted disaster, a situation that many older residents said harked back to the days of deprivation after World War II.

Most gas stations around the region remained closed. Those still open drew lines that left people waiting 12 hours or more, and then only to fill a portion of their tanks.

In the city of Senmaya, about 200 miles north of Tokyo, Sumie Sato and her husband, Naohiro, both 26, slept in their subcompact overnight to receive about five gallons of precious gasoline.

"We have a 2-month-old son at home, so we can't take any chances," said Sumie. "My son has been sick, so if he gets really bad we'll need gas to take him to the hospital."

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Lee reported from Tokyo and Kim from Los Angeles. Glionna reported from Senmaya. Times staff writer Thomas H. Maugh II in Los Angeles contributed to this report.

Kan Sees Progress At Fukushima Plant As Smoke At Reactors Hampers Work (BLOOM)

By Yuji Okada And Tsuyoshi Inajima

Bloomberg News, March 22, 2011

Japanese Prime Minister Naoto Kan said he can see "light at the end of the tunnel" even as smoke at two reactors hampered efforts to restore cooling systems at the troubled Fukushima Daiichi nuclear plant.

Tokyo Electric Power Co. evacuated engineers and halted work after smoke was seen billowing from the No. 3 unit, Hitoshi Emukai, a Tokyo-based spokesman at the utility, said yesterday. White smoke seen later at the No. 2 reactor is likely steam, said Naoki Tsunoda, another company spokesmen.

Kan's optimistic statements are the strongest yet from a Japanese official amid the world's worst nuclear crisis in 25 years. The battle to prevent a meltdown entered its 12th day as reports of radiation contamination at sea and on land multiplied. Cooler temperatures in pools holding spent fuel rods are the result of thousands of tons of seawater sprayed over the reactors since the March 11 earthquake and tsunami damaged the cooling systems.

"While we haven't reached the point where we can say we've gotten out of this crisis situation, it can be said that we can see the light at the end of the tunnel," Kan said at a meeting of his crisis response team in Tokyo.

Firefighters have sprayed seawater on the reactor buildings from fire engines in attempts to refill storage pools and prevent fuel rods from overheating and releasing more radiation.

Regulators in Japan and the US said not covering the hot plutonium rods could cause them to catch fire and release radioactive pollution if exposed to air.

Nikkei 225 Stock Average futures expiring in June jumped 2.9 percent to 9,440 in Singapore after Tokyo Electric said it connected a power cable from reactor 3 to 4, and Kan said progress was being made restoring power to units 1 and 2. Japan's markets were closed for a public holiday yesterday.

The death toll from the nation's worst postwar disaster rose to 8,805 as of 9 p.m. local time yesterday with 12,654 people missing, according to the National Police Agency in Tokyo. The earthquake and ensuing tsunami devastated the country's northern coastline and forced hundreds of thousands to evacuate.

"We are at the beginning of the post-accident phase," Andre-Claude Lacoste, head of the Paris-based Autorite de Surete Nucleaire, a watchdog group, said at a press conference in Paris yesterday. "Japan will have to deal with the consequences of this accident for decades."

The Japanese government is risking a food scare by failing to clarify where produce is contaminated and stopping some shipments, said Toshihiko Baba, a spokesman for the Central Union of Agricultural Co-operatives in Japan, which represents more than 4.8 million farmers. Radiation levels found in food so far aren't harmful, Chief Cabinet Secretary Yukio Edano said.

Japan's nuclear safety agency said the nation will limit distribution of spinach and milk after samples from the area near the plant 135 miles (220 kilometers) north of Tokyo were found to have higher-than-normal radiation levels. Spinach sampled at Hitachi, 97 kilometers south of the plant, contained 27 times the government limits for Iodine-131, according to the health ministry. That spinach won't enter the food chain.

"Food-borne radiation will last longer than airborne radiation," Gregory Hartl, a spokesman for the World Health Organization in Geneva, said in an interview. "Even smaller amounts of radiation in food could potentially be more dangerous because you ingest it."

Japan's limits are based on assumptions about how much contaminated food a person may eat, Edwin Lyman, a specialist on nuclear materials for the Union of Concerned Scientists in Washington, said in a press call.

"It will be a dilemma for a lot of consumers in Japan," Lyman said. "People are going to have to understand the basis for those limits."

Japanese officials will have to perform triage on farmland — closing some areas entirely, monitoring some for radiation and labeling some as safe, said Kenneth Bergeron, a former nuclear scientist at Sandia National Laboratory in Albuquerque, New Mexico.

"Japan is going to have to put in place a very extensive monitoring system to make sure that every batch of produce that might come out of this area is monitored," Bergeron said.

Asian countries are screening Japanese imports, and Taiwan yesterday detected radiation on vegetables that was within acceptable limits. Stores and restaurants across Asia dropped Japanese food from shelves and menus.

Tokyo Electric reported radioactivity levels today above allowable limits in seawater sampled near the plant at 2:30 p.m. local time, Kyodo News reported. Rain, or the seawater that crews are using to cool the plant, may have washed contaminants into the sea, Kyodo News said.

Fuel shipments at Sendai Shiogama Port have resumed and roads to the worst-hit areas reopened, adding to signs the crisis may be passing its peak.

Radiation containment domes at the reactors are intact and the situation at the plant "is on the verge of stabilizing," the US Nuclear Regulatory Commission's Bill Borchardt said.

"The fact that offsite power is close to being available for use at plant equipment is perhaps the first optimistic sign that things could be turning around," Borchardt, executive director for operations, said at a meeting at the agency's headquarters in Rockville, Maryland.

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Radiation Over US Is Harmless, Officials Say (NYT)

By William J. Broad

New York Times, March 22, 2011

Harmless traces of radiation from the stricken nuclear complex in Japan have been detected wafting over the East Coast of the United States, European officials said Monday.

Since last week, the officials have tracked the radioactive plume as it has drifted eastward on prevailing winds from Japan — first to the West Coast and now over the East Coast and the Atlantic, moving toward Europe.

Health experts said that the plume's radiation had been diluted enormously in its journey of thousands of miles and that — at least for now, with concentrations so low — its presence will have no health consequences in the United States. In a similar way, faint radiation from the Chernobyl disaster spread around the globe and reached the West Coast in 10 days, its levels detectable but minuscule.

Atomic and atmospheric specialists expect that, in time, the extremely diffuse Japanese plume will spread so that it extends over most of the planet's northern regions.

The global network of the Comprehensive Test Ban Treaty Organization, an arm of the United Nations in Vienna, has detected the movements of the plume. The organization's mandate is to monitor the global ban on the testing of nuclear arms, and it has more than 60 stations that sniff the air for radiation spikes.

The group has declined to make the recent findings public, but it shares its information with 120 member states, some of which have divulged the status of the plume's movements.

On Friday, European officials said that network sensors in Sacramento had detected the radioactive plume, picking up traces of iodine 131 and cesium 137 — highly dangerous byproducts of reactor operation that in large amounts can cause cancer. The measured levels were judged to be many millions of times lower than concentrations that would pose a danger to human health.

Late Friday, the Department of Energy confirmed the European statements about the arrival of the radioactive plume in the continental United States, saying its "minuscule quantities" of radiation posed no health hazard.

On Monday, European officials said the plume had reached the East Coast after drifting over North America. One station that detected the fresh radioactivity is in Charlottesville, Va., officials said.

Although the legal mandate of the treaty organization is to scan the globe for inconspicuous signs of clandestine bomb blasts — not the repercussions of reactor accidents — its officials recently decided to start sharing their data more widely in an effort to help international authorities who are struggling with the Japanese crisis.

In a statement on Friday, the Vienna group said it had begun sharing the monitoring information with the International Atomic Energy Agency and the World Health Organization. The group explained that it was "responding to respective requests" from the two organizations that it received Thursday for aid in "assessing the situation."

Japan's Nuclear Crisis Causes Run On Radiation Detectors (NYT)

By Verne G. Kopytoff

New York Times, March 22, 2011

SAN FRANCISCO — Since Japan's nuclear crisis started, Tim Flanegin's phone has barely stopped ringing with orders for Geiger counters, the radiation detectors, to the point that he has no more in stock.

He posted a message on his site, Geigercounters.com, to warn new customers and to reassure those who had already placed orders that they would be filled "in the coming days, weeks and months."

Last Thursday, after receiving hundreds of orders, "I had to shut it down almost completely," Mr. Flanegin said from his home in Prescott, Ariz. Compared with the typical 20 orders a week, he said, "the demand has been so overwhelming."

With small amounts of radiation from Japan's damaged reactors wafting across the Pacific Ocean, relief crews, businesses and ordinary consumers have bought nearly every Geiger counter available from the few retailers that sell them. The run is a grim reminder of the scope of the disaster and the widespread concern about radiation contamination, including in the United States.

Many people buying the devices say they are worried about their food becoming contaminated. One customer, Mr. Flanegin said, was a theme park in Japan that wanted to check its food supplies as a precaution for its visitors.

Radiation detectors come as hand-held devices, wrist watches and pager-size gadgets that hang from the belt. Their cost varies from \$150 for a self-assembled kit to \$4,000 for a more sophisticated version that stores radiation readings along with the GPS coordinates of where those readings were taken.

Technically, Geiger counters are just one type of radiation detector. But many people use the term to describe all radiation detection equipment.

Law enforcement, fire departments, military, hospitals, scientific laboratories, schools and prospectors are the typical customers. Federal government agencies seem to be well enough stocked that they are not scrambling to buy more, according to the sellers interviewed.

Usually, the general public, other than a small group of hobbyists, has little interest in radiation.

But that changed after a devastating earthquake and tsunami set off Japan's nuclear troubles. Demand for radiation detectors, along with potassium iodide pills, which can help prevent radiation-induced thyroid cancer, quickly outstripped supplies and the limited capacity to produce more.

Skepticism that the government will be forthcoming about radiation levels is driving some of the sales, said John Iovine, president of Images SI, a company in Staten Island that makes and sells Geiger counters and other scientific instruments.

"I never really felt it until people started calling up," he said. "They want their own Geiger counter to check up." Radiation levels in the United States remain within the normal range, according to the Environmental Protection Agency, which has a network of monitors across the country. Updates are available on the E.P.A.'s Web site.

During a typical week, Mr. Iovine says, he may get an order for 20 Geiger counters from a local government followed by several weeks without any additional sales. But in the week after the Japan earthquake, he said he received close to 200 orders and was now sold out. Customers are now warned that it will take six to eight weeks to fill any orders.

Still, buying a radiation detector is just the first step, Mr. Iovine said. Owners of the devices need to discern between dangerous radiation levels and a normal background reading.

"To use it is very simple," Mr. Iovine said. "To interpret the results gets a little more difficult."

Naturally occurring radiation varies depending on factors like local geology and altitude. People are exposed to additional radiation when they get an X-ray or fly in an airplane.

Robert Corsetti, director of sales and marketing for Berkeley Nucleonics, which makes and sells industrial-grade radiation detection equipment, said that calls to his company, which is based in San Rafael, Calif., increased up to 15 times the normal level after the problems started in Japan. In some cases, people are simply calling to ask if they are at risk, and not to buy something.

"We send out PowerPoints that dispel rumors," Mr. Corsetti said. "I send the e-mail 20 times a day." In one case, he said, an airline pilot who regularly flies to Tokyo wanted a detector to determine if he was being exposed to more radiation than usual. NBC News crew members in Japan are using radiation detectors from Berkeley Nucleonics that they can wear on their belts, much like beepers. The devices sound an alarm when they detect excessive radiation and when the dose exceeds a specified level over time.

In addition to the detectors, NBC News personnel are equipped with protective masks and suits, along with access to potassium iodide pills.

Mr. Flanegin, the owner of Geigercounters.com, expressed sympathies for the Japanese people, even if their dire situation had lifted his sales. All the scrambling to meet customer orders, he said, "is nothing compared with what the Japanese people are going through."

Recovery Efforts Continue At Japan's Fukushima Nuclear Plant (PLATTS)

By Steven Dolley, Ann MacLachlan

Platts, March 22, 2011

Pressure levels rose then stabilized Sunday in one of the crippled reactors at the Fukushima I nuclear power plant in Japan, government and industry officials said.

Plans being considered earlier Sunday to vent radioactive steam from the reactor to reduce pressure were deferred and workers will continue to monitor reactor pressure, Tokyo Electric Power Co. said in a statement Sunday afternoon local time.

Efforts continue to restore outside electric power to instruments and safety systems at the site's six reactors and spent fuel pools. The Japan Atomic Industrial Forum, the nation's nuclear industry group, said in an update that as of 10 pm Sunday local time (1300 GMT), an external power cable had been connected to the "distribution switchboards" at units 1 and 2. Efforts were continuing to restore external power to units 3 and 4. Fuel is still "partially or fully exposed" in units 1, 2 and 3, JAIF said, creating a risk of fuel damage, generation of explosive hydrogen gas and possible core melting.

Reactor pressure levels are "stable" at units 1 and 3, but is "unknown" for unit 2, JAIF said.

Injection of seawater to cool reactor cores continues at units 1, 2 and 3, Tepco said.

Cooling capability was restored Sunday to spent fuel pools at units 5 and 6, where temperatures had been rising, JAIF said. Emergency workers continued efforts Sunday to spray water into the pools at units 3 and 4 and that had some effect, it said without providing details. Seawater "injection" continues at the unit 2 pool and is being "considered" for the unit 1 pool, the group said.

Chief Cabinet Secretary Yukio Edano suggested at a briefing Sunday local time that the Fukushima reactors will never be restored to operation.

"As the government has [nuclear energy] authorities, it's difficult for me to say anything definite before following the appropriate procedures," Edano said according to a report by Australian ABC News.

"Looking at the plant from an objective point of view, I think it's clear in a way if the Fukushima Daiichi plant is in a state of being able to function or not," Edano said. "I hope you can get it from the way I said it."

US Nuclear Regulatory Commission Chairman Gregory Jaczko said in an interview on C-SPAN Sunday that the most urgent priority remains restoring reliable cooling to Fukushima's reactors and spent fuel pools.

He declined to assess the plant's current safety status, saying "it's still a very difficult situation."

Jaczko also declined to comment on a New York Times report Saturday that said Tepco executives may have "wasted precious time in the early hours of the nuclear crisis, either because of complacency or because they did not want to resort to emergency measures that could destroy the valuable plant."

The story quoted Kuni Yogo, formerly an atomic energy policy planner in Japan's Science and Technology Agency, as saying he believed Tepco executives "did not recognize the risks soon enough. They failed to cool the reactors on the day of the

earthquake, March 11, and even after a hydrogen explosion the following day, they waited more than four hours to start dousing the reactors with seawater. They did not even try to put water into the spent fuel pools for several days."

Jaczko said only that "we will have an opportunity when the crisis is resolved to go back and see how decisions were made."

The US NRC is conducting short-term and long-term safety reviews to determine what issues the Fukushima accident raises for the US fleet of 104 nuclear power reactors, roughly a fourth of which are similar in design and vintage to the stricken Japanese units. The NRC staff will brief the commission Monday morning on the accident.

Much more detailed information on the events in Japan will be available to inform the long-term NRC safety review, which will take "several months," Jaczko said.

FRENCH REGULATOR SAYS JAPANESE SITUATION STILL 'PRECARIOUS'

The situation at Japan's Fukushima I nuclear power plant "remains serious and precarious," Olivier Gupta, deputy director general of France's nuclear safety authority ASN, told journalists in Paris Sunday morning local time.

Gupta said the most serious short-term danger was at the plant's unit 3 reactor, where Tepco had earlier in the day planned to vent the reactor vessel to relieve mounting pressure without knowing for sure whether the pressure suppression pool at the bottom of the containment was intact.

"If the pool is too damaged, the [radioactive] releases will not be filtered" before attaining the atmosphere, Gupta said. The pool is designed in normal operation to trap radionuclides via a bubbling mechanism before the containment gases are vented. Tepco said that the proposed venting would release radioactive materials totalling [6.5 Exabecquerels], "which surpasses the standard for a serious accident," he said.

France's Institute of Radiological Protection and Nuclear Safety on Thursday estimated that radioactive releases from the Fukushima plant so far were about an order of magnitude lower than that. Most of the releases have been from voluntary venting of the reactors at units 1, 2 and 3 to prevent pressure from building up inside. Up to now, all those releases have been filtered.

Gupta said that although Tepco was doing what it could to restore power and cooling to the stricken reactors and spent fuel pools at Fukushima, "the situation from a technical viewpoint has not changed significantly for several days."

Gupta added that the situation cannot be considered stabilized until Tepco has restored more permanent power supply and more lasting means of cooling the units than those being used now.

EU Fails To Agree On Nuclear Stress-Tests (WSJ)

By Geoffrey T. Smith And Bernd Radowitz

Wall Street Journal, March 22, 2011

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

Japan Extended Reactor's Life, Despite Warning (NYT)

By Hiroko Tabuchi, Norimitsu Onishi And Ken Belson

New York Times, March 22, 2011

TOKYO — Just a month before a powerful earthquake and tsunami crippled the Fukushima Daiichi plant at the center of Japan's nuclear crisis, government regulators approved a 10-year extension for the oldest of the six reactors at the power station despite warnings about its safety.

The regulatory committee reviewing extensions pointed to stress cracks in the backup diesel-powered generators at Reactor No. 1 at the Daiichi plant, according to a summary of its deliberations that was posted on the Web site of Japan's nuclear regulatory agency after each meeting. The cracks made the engines vulnerable to corrosion from seawater and rainwater. The generators are thought to have been knocked out by the tsunami, shutting down the reactor's vital cooling system.

The Tokyo Electric Power Company, which runs the plant, has since struggled to keep the reactor and spent fuel pool from overheating and emitting radioactive materials.

Several weeks after the extension was granted, the company admitted that it had failed to inspect 33 pieces of equipment related to the cooling systems, including water pumps and diesel generators, at the power station's six reactors, according to findings published on the agency's Web site shortly before the earthquake.

Regulators said that "maintenance management was inadequate" and that the "quality of inspection was insufficient."

Less than two weeks later, the earthquake and tsunami set off the crisis at the power station.

The decision to extend the reactor's life, and the inspection failures at all six reactors, highlight what critics describe as unhealthy ties between power plant operators and the Japanese regulators that oversee them. Expert panels like the one that

recommended the extension are drawn mostly from academia to backstop bureaucratic decision-making and rarely challenge the agencies that hire them.

Because public opposition to nuclear power makes it hard to build new power plants, nuclear operators are lobbying to extend their reactors' use beyond the 40-year statutory limit, despite uneven safety records and a history of cover-ups. The government, eager to expand the use of nuclear energy and reduce the reliance on imported fossil fuels, has been largely sympathetic. Such extensions are also part of a global trend in which aging plants have been granted longer lives.

Over the next decade in Japan, 13 more reactors — and the other 5 at the Fukushima Daiichi plant — will also turn 40, raising the prospect of gargantuan replacement costs. That is one reason critics contend that the Nuclear and Industrial Safety Agency's committee in charge of inspecting aging nuclear power plants may play down its own findings.

In approving the extension in early February, regulators told Tokyo Electric to monitor potential damage from radiation to the reactor's pressure vessel, which holds fuel rods; corrosion of the spray heads used to douse the suppression chamber; corrosion of key bolts at the reactor; and conduction problems in a gauge that measures the flow of water into the reactor, according to a report published in early February.

The committee, which convened six times to review findings gathered during inspections of the No. 1 unit at the power station, found that Tokyo Electric had met all required protections from earthquakes. Inspectors, however, had spent just three days inspecting the No. 1 unit, a period that industry experts say was far too brief because assessing the earthquake risk to a nuclear plant is one of the most complex engineering problems in the world.

Despite these doubts, the committee recommended that Tokyo Electric be given permission to run the No. 1 unit, which was built by General Electric and began operating in 1971, for an additional decade. During the approval process, the company claimed that the reactor was capable of running for 60 years.

Mitsuhiro Tanaka, an engineer who worked on the design of the reactors at the Fukushima Daiichi plant, said the reactors there were outdated, particularly their small suppression chambers, which increased the risk that pressure would build up within the reactor, a fault eliminated in newer reactors. Since the tsunami, officials at Fukushima Daiichi have tried to relieve rising pressure inside the reactors, several times resorting to releasing radioactive steam into the atmosphere, a measure that in turn has contributed to the contamination of food and water in the area.

"It was about time the reactor was replaced," Mr. Tanaka said. "The tsunami would have caused great damage, regardless. But the pipes, the machinery, the computers, the entire reactors — they are just old, and that did not help." Somewhat younger reactors, Nos. 2, 3, and 4, also suffered extensive damage.

Regulators approved the 10-year extension even though aging reactors at Tokyo Electric, as well as those at other power companies, had suffered a series of problems as far back as a decade ago. Attempts to cover them up and manipulate data, particularly by Tokyo Electric, the country's biggest utility, underscored not only the problems of the nuclear industry but also Japan's weakness in regulating it. The company has admitted wrongdoing.

A Tokyo Electric spokesman, Naoki Tsunoda, said: "We are committed to carrying out proper inspections in the future. We will study why this has happened and endeavor to inform the public."

In 2000, a whistle-blower at a separate company that was contracted to inspect the reactors told regulators about cracks in the stainless steel shrouds that cover reactor cores at Fukushima's Daiichi plant. But regulators simply told the company to look into the issue, allowing the reactors to keep operating.

Nuclear regulators effectively sat on the information about the cracks in the shrouds, said Eisaku Sato, the governor of Fukushima Prefecture at the time and an opponent of nuclear power. He said the prefecture itself and the communities hosting the nuclear plants did not learn about the cracks until regulators publicized them in 2002, more than two years after the whistle-blower reported the cracks.

In 2003, regulators forced Tokyo Electric to suspend operations at its 10 reactors at two plants in Fukushima and 7 reactors in Niigata Prefecture after whistle-blowers gave information to Fukushima Prefecture showing that the company had falsified inspection records and hid flaws over 16 years to save on repair costs. In the most serious incident, Tokyo Electric hid the large cracks in the shrouds.

"An organization that is inherently untrustworthy is charged with ensuring the safety of Japan's nuclear plants," said Mr. Sato, governor from 1988 to 2006. "So the problem is not limited to Tokyo Electric, which has a long history of cover-ups, but it's the whole system that is flawed. That's frightening."

Like many critics of Japan's nuclear industry, Mr. Sato attributed weak oversight to a conflict of interest that he said essentially stripped the Nuclear and Industrial Safety Agency of its effectiveness. The agency, which is supposed to act as a watchdog, is under the Ministry of Economy, Trade and Industry, which has a general policy of encouraging the development of Japan's nuclear industry.

The ministry and the agency, in turn, share cozy ties with Tokyo Electric and other operators — some of which offer lucrative jobs to former ministry officials in a practice known as “amakudari,” or descent from heaven.

“They’re all birds of a feather,” Mr. Sato, 71, said in an interview at his home in Koriyama, in Fukushima Prefecture.

The Japan Nuclear Energy Safety Organization, which is supposed to provide a second layer of scrutiny, is understaffed and largely an advisory group. Masatoshi Toyoda, a former vice president at Tokyo Electric who, among other jobs, ran the company’s nuclear safety division, said the organization should be strengthened. The United States had a similar setup until the 1970s, when Congress broke up the old Atomic Energy Commission into the Department of Energy and the Nuclear Regulatory Commission.

“Like the Nuclear Regulatory Commission in the United States, they should have full-time engineers who should check the safety of power plants,” Mr. Toyoda said. “I’ve been telling the government that the system should be changed, but any changes to Japan’s nuclear policy take a long time.”

Hidehiko Nishiyama, deputy director general of the Nuclear and Industrial Safety Agency, said that “there are no problems with the current safety setup.” He added that the extension of the life of Reactor No. 1 “was approved on the understanding that any problems found would be fixed by Tokyo Electric.”

But critics say the approval process for extending the lifespan of reactors is fraught with problems. Limited amounts of information are disclosed before approval is granted. The government reviews only reports submitted by utilities, and does not conduct its own tests to determine whether those reports are true, according to Chihiro Kamisawa, a nuclear safety researcher at the Citizens’ Nuclear Information Center, Japan’s most vocal nuclear watchdog.

“They are stretching the limit,” Mr. Kamisawa said.

Japan Damage Cost: \$300 Billion (WSJ)

Among Costliest Events Ever for Insurance Industry; East Asia Export Concerns

By Anita Greil, Shai Oster And Serena Ng

Wall Street Journal, March 22, 2011

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

Japan’s Leader Tries To Assuage Nuclear Concerns (WT)

WHO, World Bank alarmed

By Christopher Johnson, *The Washington Times*

Washington Times, March 22, 2011

NARA, Japan | Prime Minister Naoto Kan tried Monday to reassure the world that emergency crews are making progress to prevent a wider nuclear disaster in Japan, as U.N. health officials and the World Bank delivered more bad news for the battered nation.

Japan’s National Police Agency raised the death toll Monday to 8,805, with 12,654 missing. The earlier death toll was about 2,000.

After workers over the weekend struggled to rig electrical cables to the six nuclear reactors at the Dai-ichi power plant, Mr. Kan said he saw hope of restoring cooling systems and preventing a meltdown at four of the reactors crippled by the tsunami caused by the massive earthquake 10 days ago.

“While we haven’t reached the point where we can say we’ve gotten out of this crisis situation, it can be said that we can see the light at the end of the tunnel,” Mr. Kan said during a crisis meeting at his Tokyo office.

Shortly after the meeting, however, nuclear safety officials reported smoke billowing from two reactors, forcing workers to temporarily halt attempts to restore power. Later in the day, engineers managed to hook up power lines to all six units and started a water pump at one.

The World Health Organization (WHO), meanwhile, warned of contamination in farm products beyond the vicinity of the seaside nuclear reactors in Fukushima province, about 150 miles northeast of Tokyo.

The World Bank added another blow Monday, warning that Japan may need five years to rebuild from the disasters, with between \$122 billion to \$235 billion in damages. That would equal 2.5 percent to 4 percent of the gross domestic product of Japan, the world’s third-largest economy.

The bank also predicted that the cost to private insurers will be up to \$33 billion and that the government will spend \$12 billion on reconstruction in the current budget and much more later.

Japanese officials ordered the suspension of shipments of spinach from four provinces that normally provide the greater Tokyo area with much of its fresh produce.

Japan's Ministry of Science said traces of radioactive iodine were found in samples of tap water in nine provinces including Tokyo, Saitama, Chiba and Kanagawa, home to more than 30 million people.

The WHO report suggested that wind and rain has blown radioactive particles to the west and south far beyond Japan's 18-mile danger zone around the power plant.

While Japanese government officials said the low levels of radiation posed no immediate health risks, the WHO said contaminated food may have already made it to markets in Japan. It found no evidence that Japan was deliberately exporting radiated food to countries that have stepped up screening of goods from Japan.

"Quite clearly it's a serious situation," said Peter Cordingley, a regional WHO spokesman. "It's a lot more serious than anybody thought in the early days when we thought that this kind of problem can be limited to 12 to 18 miles. It's safe to suppose that some contaminated produce got out of the contamination zone."

Many consumers in Japan shunned spinach, sold in packages that often do not show the place of origin.

"Please do not overreact, and act calmly," said Chief Cabinet spokesman Yukio Edano. "Even if you eat contaminated vegetables several times, it will not harm your health at all."

Mr. Edano said Fukushima's operator, Tokyo Electric Power Co., will compensate farmers affected by bans on the sale of raw milk, spinach and canola from Fukushima, Ibaraki, Tochigi and Gunma provinces.

Thousands of farmers in those areas, who already have endured fuel shortages and power cuts, worry about potential nuclear fallout in their soil a few weeks ahead of planting season for an array of vegetables supplying about 40 million consumers in the greater Tokyo area.

The Health Ministry also advised a village 20 miles northwest of the plant to avoid drinking tap water because of elevated levels of iodine. Ministry spokesman Takayuki Matsuda said iodine three times the normal level was detected there. However, the event the higher amount in a quart of water equaled only about 1/26th of the level of a normal chest X-ray.

The radiation issues overshadowed progress made in bringing volunteers and supplies to devastated areas of northeastern Japan.

While thousands of evacuees were bused to sports arenas such as the Saitama Super Arena outside Tokyo, many survivors chose to stay closer to their hometowns, despite food and water shortages, in order to search for missing relatives or recover valuables from their destroyed homes.

- This article is based in part on wire service reports.

US Agrees To Help Chile Go Nuclear, Despite Japan Disaster (CSM)

By Steven Bodzin, Correspondent

Christian Science Monitor, March 22, 2011

Among the "urgent events" that President Obama said he discussed Monday with Chilean President Sebastián Piñera was the unfolding nuclear crisis in Japan that began March 11 when a magnitude 9.0 earthquake and resulting tsunami along the northeast coast. Skip to next paragraph

While the crisis only appeared to be mentioned in passing during a press conference in Santiago during Mr. Obama's five-day regional tour, it has set off a firestorm of criticism against Mr. Piñera and caused a major rethink over energy policy here.

Yesterday, some 2,000 people marched through the capital to protest a new US-Chile nuclear power cooperation agreement signed Friday as radiation leaked from Japan's Fukushima nuclear plant. The agreement promises cooperation in operating research reactors, handling civilian nuclear training and safety measures. It seemed a natural extension of Piñera's steady push for nuclear power to ensure electricity for Chile's world-leading copper industry.

But recent events appear to have caused Piñera to pivot.

Like Japan, Chile is seismic – its 9.5-magnitude quake in 1960 was the most powerful of the 20th century. And Chile's risk management culture is not as mature as Japan's. Now, this mineral-rich nation faces an energy dilemma: whether to choose earthquake-prone nuclear power plants or greenhouse gas-emitting coal-fired power plants. Walking the fence

Ditching nuclear power would mark a sharp shift for Chile's government. Piñera said in an energy policy address in November that the country should build small nuclear plants like those found on nuclear submarines – an idea also promoted by the US Commerce Department. And last month, Energy Minister Laurence Golborne visited France and signed a nuclear cooperation agreement. The signing was announced with a press release, unlike the silence around Friday's closed-doors ceremony.

Then on Friday, Mr. Golborne said on Twitter: "I've been clear. We don't have nuclear plants in Chile, there are no plans to build them, and there's a commitment not to make a decision during this government."

Former President Ricardo Lagos, who supported nuclear power while in office, told local newspaper La Tercera: "Today the conditions don't exist to think about nuclear power. A lot of time will pass before it can be reconsidered." US hunts for nuclear markets

If it doesn't use nuclear energy, then how will Chile power its growing copper extraction industry? Coal.

Chile has already approved almost a dozen new coal-fired power plants to allow its metals industry to grow to meet world demand. The country approved in February a 2,400-megawatt plant for the coast, which if built will be the biggest coal-fired plant in South America.

But there's a heavy price to pay environmentally for that. Growth of coal and diesel-fired electricity to power copper mines and smelters was one of the reasons that copper produced more greenhouse gases per ton in 2008 than in 2004, according to the Chilean Copper Commission.

That, as well as the US's hunt for new markets for its nuclear technology, could keep Chile on a nuclear course.

In a November report, the US General Accounting Office called on the Commerce Department to identify new markets, saying the US has lost much of its share in the global nuclear marketplace.

"US exports of sensitive nuclear material such as natural and enriched uranium remained stable, while the US share of global exports for these materials decreased significantly, from 29 percent to 10 percent, from 1994 through 2008," the agency said.

From: RMTFACTSU_ELNRC
To: LIA11 Hoc; LIA01 Hoc; LIA02 Hoc; LIA07 Hoc; LIA08 Hoc; LIA12 Hoc; LIA04 Hoc; Harrington, Holly; McIntyre, David; Burnell, Scott; ET07 Hoc
Subject: DoS - JAPAN EARTHQUAKE SITUATION REPORT No. 22 03/22/I (SBU)
Date: Tuesday, March 22, 2011 7:23:15 AM

Subject: JAPAN EARTHQUAKE SITUATION REPORT No. 22 03/22/I (SBU)

SENSITIVE BUT UNCLASSIFIED

SITUATION REPORT No. 22

Japan Earthquake TFJP01

Tuesday, March 22, 2011
0500 EDT

FUKUSHIMA DAI-ICHI NUCLEAR ISSUES

- (SBU) The Tokyo Electric Power Company (TEPCO) continued to focus on cooling spent fuel pools and reactors Nos. 3 and 4. There were no major changes in radiation levels at the Fukushima site. *(TFJP01/Interagency telcon, Department of Energy Situation Report, International Atomic Energy Agency)*
- (SBU) The temperature and pressure in reactors Nos. 1, 2, 5, and 6 appeared stable. TEPCO connected electricity to units Nos. 1, 2, and 4, and will begin to test pumps and other cooling systems. Two generators at reactor No. 6 are providing power to cool the reactors and spent fuel pools in units Nos. 5 and 6. *(TFJP01/Nuclear Regulatory Commission, Department of Energy Situation Report, International Atomic Energy Agency)*
- (SBU) Firefighters and the Self Defense Forces (SDF) sprayed additional water to continue cooling reactor No. 3. *(TFJP01/Embassy Tokyo e-mail, Kyodo)*
- (SBU) Responding to findings that radioactive substances were detected in the seawater sample taken near the Fukushima plant, Chief Cabinet Secretary Edano said although the radiation levels were above normal, they would not be harmful to human beings. The Japanese government ordered enhanced monitoring of seawater radiation levels. *(TFJP01/Embassy Tokyo e-mail)*
- (SBU) Following his visit to Japan, IAEA Director General Amano said while the situation remains serious, there are signs of improvement at the Fukushima plant. *(UNVIE Vienna 100)*
- (SBU) The Japanese government asked Fukushima residents not to take supplies of potassium iodide tablets distributed by city authorities without specific government instructions since the pills could cause more harm than good for those living outside of the 12-mile radius evacuation zone. *(TFJP01/Embassy Tokyo e-mail)*

CONSULAR ISSUES AND POST OPERATIONS

- (SBU) An American woman teaching English in Japan was found dead in Ishinomaki, Miyagi Prefecture, the first U.S. citizen fatality. Her father is scheduled to arrive in Japan March 22 to officially confirm her identity. *(TFJP01/Bureau of Consular Affairs e-mail)*
- (SBU) Embassy Tokyo received the shipment of 170,000 packages of potassium iodide and began distribution to U.S. Government personnel at 0300 EDT. *(TFJP01/Embassy Tokyo e-mail)*

- (SBU) Embassy Tokyo issued an updated Warden Message March 22 with information regarding the availability of potassium iodide tablets. One private U.S. citizen requested and received potassium iodide. *(TFJP01/Embassy Tokyo e-mail)*

GENERAL OVERVIEW OF AFTERMATH AND ASSISTANCE

- (SBU) The National Police Agency reported 9079 dead, 12,645 missing, 2633 injured, 318,614 internally displaced persons, and 127,311 destroyed structures. *(TFJP01/Embassy Tokyo e-mail)*
- (SBU) Eight prefectures plan to host in hotels and public facilities 152,000 people, approximately 48 percent of the total number in evacuation centers. The Japanese government also plans to build 30,000 transitional shelters in the next two months. *(TFJP01/UN Office for the Coordination of Humanitarian Affairs e-mail)*
- (U) TEPCO announced it will resume rolling power outages March 22 following a three-day suspension. The blackouts will affect approximately ten million households. *(Kyodo)*
- (SBU) The Government of Japan is considering amending legislation to create a new agency to lead reconstruction efforts. *(TFJP01/USAID e-mail)*
- (SBU) The Japan Platform, a consortium of Japanese NGO, private sector, and government partners, informed Embassy Tokyo the Japanese government continues to meet emergency needs in tsunami-affected areas with limited contributions from local and international NGOs. *(TFJP01/USAID e-mail)*
- (U) The Walt Disney Co. is resuming some operations in Japan, but its theme parks will stay closed due to electricity and transportation disruptions. *(AP)*
- (SBU) Ten thousand sets of personal protective equipment, such as suits, masks, gloves, decontamination bags, and other supplies, arrived in Tokyo March 21. Once the equipment clears customs March 22, the Department of Defense and the USAID Disaster Assistance Response Team will transport the suits to an SDF post in Fukushima Prefecture. *(TFJP01/USAID e-mail)*

Please see our classified website at <http://scs.state.sgov.gov>

Drafted: JHuck/AVu

Approved: RWThomas

Dist: State (all bureaus), NSS, OSD, NMCC, JCS, CIA, OSC, NCTC, DHS, DNI

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From: Harrington, Holly
To: Brenner, Eliot; Burnell, Scott; Couret, Yvonne; Hayden, Elizabeth; McIntyre, David; Chandrathil, Prema; Dricks, Victor; Hannah, Roger; Ledford, Joey; Mittyng, Viktoria; Screnci, Diane; Sheehan, Neil; Uselding, Lara
Subject: Transcript for yesterday's meeting
Date: Tuesday, March 22, 2011 9:33:00 AM
Attachments: CommissionMeetingTranscript.pdf

And available here: <http://www.nrc.gov/reading-rm/doc-collections/commission/recent/2011/>

RRRR-267

UNITED STATES OF AMERICA
U.S. NUCLEAR REGULATORY COMMISSION

BRIEFING ON NRC RESPONSE TO RECENT NUCLEAR
EVENTS IN JAPAN

MARCH 21, 2011

9:00 A.M.

TRANSCRIPT OF PROCEEDINGS

Public Meeting

Before the U.S. Nuclear Regulatory Commission:

Gregory B. Jaczko, Chairman

Kristine L. Svinicki, Commissioner

George Apostolakis, Commissioner

William D. Magwood, IV, Commissioner

William C. Ostendorff, Commissioner

NRC Staff:

Bill Borchardt
Executive Director for Operations

1 PROCEEDINGS

2 CHAIRMAN JACZKO: Good morning everyone. The Commission
3 meets today to discuss the tragic events in Japan and to begin to consider
4 possible actions we may take to verify the safety of the nuclear facilities that we
5 regulate here in the United States. People across the country and around the
6 world who have been touched by the magnitude and the scale of this disaster are
7 closely following the events in Japan and the repercussions in this country and
8 many other countries.

9 Before we begin, I would like to offer my sincere condolences to all
10 of those who have been affected by the earthquake and the tsunami in Japan.
11 Our hearts go out to all who have been dealing with the aftermath of these
12 natural disasters and we are mindful of the long and difficult road they will face in
13 recovering. We know the people of Japan are resilient and strong and we have
14 every confidence that they will come through this difficult time and move forward
15 with resolve to rebuild their vibrant country. I believe I speak for all Americans
16 when I say that we stand together with the people of Japan at this most difficult
17 and challenging time.

18 The NRC is a relatively small agency with just about 4,000 staff, but
19 we play a critical role in protecting the American people and the environment
20 when it comes to the use of nuclear materials. We have our inspectors who work
21 full time at every nuclear plant in the country and we are proud to have world-
22 class scientists, engineers, and professionals representing nearly every
23 discipline.

1 Since Friday, March 11, when the earthquake and tsunami struck,
2 the NRC's headquarter operation center has been operating on a 24-hour basis
3 to monitor and analyze events at nuclear power plants in Japan. At the request
4 of the Japanese government and through the United States Agency for
5 International Development, the NRC sent a team of its technical experts to
6 provide an on the ground support, and we have been in continual contact with
7 them since they deployed.

8 And within the United States, the NRC has been working closely
9 with other federal agencies as part of the U.S. Government's response to the
10 situation. Here in the United States we have an obligation to the American
11 people to undertake a systematic and methodical review of the safety of our own
12 domestic nuclear facilities in light of the natural disaster and resulting nuclear
13 situation in Japan. Beginning to examine all available information is an essential
14 part of our effort to analyze the event and understand its impacts on Japan and
15 implications for the United States. Our focus will always be on keeping plants
16 and radioactive materials in this country safe and secure.

17 As the immediate crisis in Japan comes to an end we will look at
18 any information we can to gain experience from the event and see if there are
19 any changes we need to make to further protect public health and safety.
20 Together with my colleagues on the Commission, we will review the current
21 status and identify the steps we will take to conduct that review. In the meantime
22 we will continue to oversee and monitor plants to ensure that U.S. reactors
23 remain safe.

24 On behalf of the Commission I want to thank all of our staff for
25 maintaining their focus on our essential safety and security mission throughout

1 these difficult days. I want to acknowledge their tireless efforts and their critical
2 contributions to the U.S. response to assist Japan. In spite of the evolving
3 situation, the long hours, and the intensity of efforts over the past week, the staff
4 has approached their responsibilities with dedication, determination, and
5 professionalism, and we are all incredibly proud of their efforts. The American
6 people can also be proud of the commitment and dedication within the federal
7 workforce, which is exemplified by our staff every day. And again, I want to
8 reiterate certainly on behalf of the Commission and all of us here in this room our
9 sympathy with the crisis and the difficult situation for our friends and colleagues
10 in Japan, and we look forward to continuing our efforts to provide them with
11 assistance as they continue to deal with a very challenging situation, not only
12 with the nuclear facilities but with many of the other impacts from this natural
13 disaster in Japan. I would like to offer Commissioner Svinicki an opportunity to
14 make some comments.

15 COMMISSIONER SVINICKI: Thank you Mr. Chairman. I want to
16 add my voice to that of others regarding the great sympathy we feel over the loss
17 and devastation due to the earthquake and tsunami in Japan. The dramatic
18 images of the events at Fukushima, images that have riveted so many of us over
19 the course of the past week, have an added dimension for us as a community of
20 nuclear safety professionals because for us these images are not an abstraction.
21 Many of us have traveled to Japan; we have toured the facilities of our Japanese
22 colleagues. We have worked alongside them in support of the shared goal of
23 advancing nuclear safety. The sense of anguish we feel as we desire so
24 desperately to do something, anything we can, to help our friends and colleagues
25 in Japan has been so clearly evident on the faces of the men and women

1 working here at NRC. We are heartsick over this tragedy. Some may
2 characterize that our faith in this technology is shaken, but nuclear safety has not
3 been and cannot be a matter of faith; it is and must continue to be a matter of
4 fact. So today we continue the systematic evaluation of facts of what we know
5 about what happened and what we don't know but will piece together in the
6 coming months. Our objective is to confirm that our approach to the regulation of
7 nuclear power in this country is comprehensive and correct while applying any
8 lessons learned we can from these events. In taking the systematic and
9 deliberate approach to this review that you have called for, Mister Chairman, I'm
10 certain the Commission will achieve this objective. Thank you.

11 CHAIRMAN JACZKO: Thank you. Commissioner Apostolakis.

12 COMMISSIONER APOSTOLAKIS: I join the Chairman and
13 Commissioner Svinicki in expressing my condolences to the people of Japan and
14 I also second the Chairman's comments on commending the staff for its
15 response to this accident. Thank you, Mr. Chairman.

16 CHAIRMAN JACZKO: Commissioner Magwood.

17 COMMISSIONER MAGWOOD: Thank you, Chairman. This is in
18 many ways a very personal tragedy for me. I have many friends and colleagues
19 in Japan. I have been in touch with several of them over the last week and a
20 half. I've heard from friends in Tokyo worried about radiation and others in the
21 North who are dealing with food shortages and gasoline shortages. Everyone in
22 Japan is enduring continuing aftershocks, anxiety about the Fukushima and
23 Daiichi plant, and difficulties in communicating with friends and neighbors, and a
24 lot of uncertainty about what will happen next. I have one friend Emiko who lost
25 all her utilities for several days after the earthquake and is still waiting for water to

1 be restored. But in the aftermath of the earthquake, she is making new friends
2 as people bond together to help each other and comfort each other and make the
3 best of a difficult situation. Fortunately she found a kind neighbor who has a well,
4 and so she has been able to get water and take it to her apartment on a daily
5 basis.

6 I'm sure there's thousands of examples of people who are reaching
7 out to each other, bonding as a community, and showing the kind of resilience
8 that is going to be necessary to move forward. The scale of the tragedy is
9 staggering and the toll on life and property has been terrible, but Japan will
10 recover. But Japan will not stand alone and has not stood alone over the last
11 week and a half. We in the U.S. are close friends to the Japanese people and
12 I'm very, very proud of how our country has responded to this crisis and
13 particularly proud of how the Nuclear Regulatory Commission Staff has
14 responded as well. The staff has demonstrated both the expertise and the
15 selflessness over the last 10 days and I applaud their outstanding efforts.

16 Today the Commission will receive an update on the nuclear
17 situation in Japan, our response and our efforts to understand what has
18 happened. There will be important lessons learned from the events at the
19 Fukushima/Daiichi plant. It's essential that we identify them correctly and
20 respond to them effectively. This meeting, I expect, will be the first of many
21 Commission meetings as we engage to understand the issues and address
22 those issues to ensure the safety of U.S. nuclear power plants. And I look
23 forward to working with my partners on the Commission to do so. Thank you.

24 CHAIRMAN JACZKO: Thank you, Commissioner Magwood.
25 Commissioner Ostendorff.

1 COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman. This
2 is a vitally important meeting for the Commission and the country. I want to join
3 my colleagues in extending my personal sympathies to the people of Japan. The
4 consequences and loss of life in the earthquake and tsunami are simply
5 devastating. Our thoughts and prayers are with all. I'd like to commend the
6 Chairman, the Executive Director for Operations and the NRC staff for their
7 efforts to date in supporting the NRC's monitoring assistance associated with
8 these events. I appreciate the hard work ongoing 24/7 at the Op Center for the
9 last 11 days. Along with my other colleagues here at this table, I've been very
10 impressed with the technical competence and professionalism demonstrated by
11 the NRC staff. I'm also grateful for the highly competent team of NRC detailees
12 dispatched to Japan. While dismayed by this tragedy as a Commissioner, I am
13 also extraordinarily proud of the commitment and professionalism of our team.
14 The events that have unfolded at the Daiichi plant over the last 11 days are stark.
15 On one hand, I believe that our existing licensing and oversight activities assure
16 us that our commercial nuclear power plants in this country are safe. On the
17 other hand, I know that we must, and that we most certainly will, conduct a
18 thoughtful and rational examination of the NRC's regulatory framework with the
19 information and lessons learned resulting from the incidence in Japan. As we
20 head down this path together, I know this Commission will stay mindful of the
21 challenges that face us. As stated by Chairman Jaczko several times in the last
22 week and again today as echoed by the Commissioners, I fully support his call
23 for a systematic and methodical review. We must also do this in a way that
24 clearly communicates to the American people what this review means and what it
25 implies for the safety of our existing nuclear power plants. Thank you.

1 CHAIRMAN JACZKO: Well thank you everyone. With that, we will
2 turn it to Bill Borchardt, the Executive Director for Operations for the presentation.

3 MR. BORCHARDT: Thank you, and good morning. I would like to
4 join in your expressions of condolences to the people of Japan. I and many of
5 my colleagues on the NRC staff have had many years of very close and personal
6 interaction with our regulatory counterparts and we would like to extend our
7 condolences to them.

8 We are mindful of our primary responsibility to ensure the public
9 health and safety of the American people. We have been very closely monitoring
10 the activities in Japan and reviewing all available information to allow us to
11 conclude that the U.S. plants continue to operate safely. There has been no
12 reduction in the licensing or oversight function of the NRC as it relates to any of
13 the U.S. licensees. Contributors to the conclusion that the current fleet of
14 reactors and materials licensees continue to protect the public health and safety
15 are based on a number of principles, including the Defense in Depth.

16 The fact that every reactor in this country is designed for natural
17 events based upon the specific site that that reactor is located, that there are
18 multiple fission product barriers, and that there are a wide range of diverse and
19 redundant safety features in order to provide that public health and safety
20 assurance. We have a long regulatory history of conservative decision-making.
21 We've been intelligently using risk insights to help inform our regulatory process,
22 and we have never stopped to make improvements to the plant design as we
23 learn from operating experience over the more than 35 years of civilian nuclear
24 power in this country. Some have been derived from lessons learned from
25 previous significant events, such as Three Mile Island. We have severe accident

1 management guidelines, revisions to the emergency operating procedures,
2 procedures and processes for dealing with large fires and explosions, regardless
3 of the cause. We have a station blackout rule. We have a hydrogen rule for
4 reactors and many others which I'll go into in a little more detail later.

5 But all of these relate in one way or another to the tragic events in
6 Japan. In addition to all that we've done in the NRC and over the last week and
7 a half and over the many years as I alluded to on rulemaking type activities, the
8 industry is also performing many verification activities at this time to verify that all
9 of these processes and procedures and rules that have been implemented are
10 still valid. From a very high level, the NRC response centered from the
11 Operations Center here in Rockville as well as the NRC team that's in Japan
12 focuses on three major areas. The first is to support the Japanese government
13 and our regulatory counterpart, NISA. Second is to gather information and
14 assess that information for implications on the U.S. facilities. And the third is to
15 support the U.S. ambassador in Japan with a level of nuclear expertise that the
16 NRC is perfectly positioned to do. We are in fact mobilized to support the US
17 government in responding to this event.

18 Notwithstanding the very high level of support, we continue to
19 maintain our focus on our domestic responsibilities. And finally as my last point
20 of introduction, we do not expect the releases of radioactive material that have
21 occurred in Japan to have any effect on the health and safety of the U.S.
22 population.

23 The next slide shows the agenda for this meeting. Given the time
24 constraints, it'll be a relatively high overview of activities but the room has a
25 healthy number of NRC staff that are available to explore any questions and

1 answers that you may have later. I'll now move to, let's say, a brief overview of
2 the events.

3 On Friday, March 11th an earthquake hit Japan, resulting in the
4 shutdown of more than 10 reactors. To our understanding, the reactors'
5 response to the earthquake went according to design. There is no known
6 problems to our knowledge with the response to that event. The ensuing
7 tsunami, however, caused the loss of emergency AC power to six units at the
8 Fukushima Daiichi site; and it's those six units that have received the majority of
9 our attention since that time. Units One, Two, and Three, at that six unit site,
10 were in operation at the time. Units Four, Five, and Six were in previously
11 scheduled outages.

12 Immediately after the tsunami, there appeared that there was no
13 injection capability into the reactor vessels on Units One, Two, and Three. On
14 Saturday, March 12th, a hydrogen explosion occurred in Unit One; and then the
15 following Monday, March 14th, a hydrogen explosion in Unit Three. On the 15th
16 of March, on Tuesday, there were explosions in Unit Two and in Unit Four from
17 hydrogen originating from, we believe, overheated fuel in the spent fuel pool.

18 At this time, it's our assessment that it's likely that Units One, Two,
19 and Three have experienced some degree of core damage. Today, all three
20 units appear to be in a stable condition, with seawater injection being used to
21 keep the reactors cool. Containment integrity for all three units is also believed
22 to have been -- is currently maintained. Grey smoke has emitted from Unit
23 Three, which is the cause of the site evacuation that's been reported this
24 morning. The source of that smoke is unknown, although there is indication that
25 there's been no increase in temperature or in radioactivity.

1 On a sign of some promising news, TEPCO has been able to bring
2 offsite power onto the site from a nearby transmission line. It is now essentially
3 at the border of Units One and Two. There's early indications that there may be
4 cabling problems -- electrical cabling problems within the units. So I understand
5 that they're now in the process of laying some temporary cables to some of the
6 pumps and valves inside of Units One and Two. Over the next day or two they'll
7 be doing the same thing for Units Three and Four. There's two diesel generators
8 that are currently running and supplying power to Units Five and Six.

9 Moving to the NRC response: Shortly after 4:00 in the morning on
10 Friday, March 11th, the NRC Operations Center made the first call, informing
11 NRC management of the earthquake and the potential impact on U.S. plants.
12 We went into the monitoring mode at the Operations Center and the first concern
13 for the NRC was possible impacts of the tsunami of U.S. plants on the West
14 Coast.

15 On that same day, Friday, March 11th, we dispatched two experts
16 to Japan to help at the embassy and begin interactions with our Japanese
17 regulatory counterparts. By Monday, we had dispatched a total of 11 staff to
18 Japan. As I said, the areas of focus for this team of 11 is to support the
19 Japanese government and respond to requests from our regulatory counterpart,
20 NISA, to support the U.S. ambassador and his understanding of the nuclear
21 impacts of this event, and then third to help the information flow from Japan to
22 the U.S. NRC so that we could assess the implications on the U.S. fleet in as
23 timely a manner as possible.

24 We've had an extensive range of stakeholders that we've had
25 constant interaction with, ranging from the White House, Congressional staff, our

1 state regulatory counterparts, a wide range of other federal agencies, and of
2 course the international regulatory bodies around the world.

3 Our ongoing NRC response is that the NRC Operations Center
4 remains in a 24/7 posture. This has involved the efforts of over 250 NRC staff on
5 a rotating basis. In addition to the people that are staffing the Operations Center,
6 there is hardly a person amongst the 4,000 people in this agency that aren't in
7 one way or another contributing to the response, whether it's through information
8 technology needs for the people in Japan, or the Region IV staff in Texas, which
9 is backing up for the operations officers in our Operations Center to help maintain
10 an information flow on the currently operating reactors in this country. The entire
11 agency is coordinating and pulling together in response to this event so that we
12 can provide the assistance in Japan and not miss any of our normal activities
13 regarding domestic responsibilities.

14 In addition, we remain aware of U.S. industry efforts to provide
15 assistance with their counterparts in TEPCO in Japan.

16 The U.S. Government has an extensive network of radiation
17 monitors across the country. EPA's system has not identified any radiation levels
18 of concern in this country. In fact, natural background from things like the rock --
19 from rocks, sun, buildings, is 100,000 times more than any level that has been
20 detected to date. We feel confident in our conclusion that there is no reason for
21 concern in the United States regarding radioactive releases from Japan.

22 I'd like to focus for a few more minutes on the factors that go into
23 assuring us of domestic reactor safety. We have, since the beginning of the
24 regulatory program in the United States, used a philosophy of Defense-in-Depth,
25 which recognizes that the nuclear industry requires the highest standards of

1 design, construction, oversight, and operation, but even with that we will not rely
2 on any one level of protection for the entire purposes of protecting public health
3 and safety. So the designs for every single reactor in this country take into
4 account the specific site that that reactor is located and does a detailed
5 evaluation for any natural event such as earthquakes, tornadoes, hurricanes,
6 floods, tsunami, and many others.

7 In addition, there are multiple physical barriers to fission product
8 release at every reactor design. And then in addition to that, there are both
9 diverse and redundant safety systems that are required to be maintained
10 operable and frequently tested by NRC regulations that ensure that the plant is in
11 a high condition of readiness to respond to any scenario.

12 As I mentioned earlier, we've taken advantage of the lessons
13 learned from previous operating experience, one of the most significant in this
14 country, of course, being the Three Mile Island accident in the late 1970s. As a
15 result of those lessons learned, we've significantly revised the emergency
16 planning, the emergency operating procedures. Many human factors issues as it
17 relates to how control room operators operate the plant. We added new
18 requirements for hydrogen control to help prevent explosions inside of
19 containment and we also created requirements for enhanced indication of pumps
20 and valves.

21 We have a post-accident sampling system that requires -- or that
22 allows -- for the monitoring of radioactive material release and possible fuel
23 degradation. And of course one of the most significant changes is after Three
24 Mile Island we created the Resident Inspector Program, which has at least two

1 full time NRC inspectors on site that have unfettered access to all licensees'
2 activities 24 hours a day, seven days a week.

3 Also as a result of operating experience and ongoing research
4 programs, we have developed requirements for severe accident management
5 guidelines. These are programs that perform the "what if" scenario. What if all of
6 this careful design work, all of these important procedures and practices and
7 instrumentation, what if that all failed? What procedures and policies and
8 equipment should be in place to deal with the extremely unlikely scenario of a
9 severe accident? Those have been in effect for many years and are frequently
10 evaluated by the NRC inspection program.

11 As a result of the events of September 11, 2001, we did a similar
12 evaluation, and identified important pieces of equipment that, if, regardless of the
13 cause of a significant fire or explosion at a plant, we would have pre-staged
14 equipment, procedures, and policies to help deal with that situation. All of these
15 things are directly applicable to the kinds of very significant events that are taking
16 place in Japan. Over the last 15 or 20 years, there's been a number of new
17 rulemakings that directly relate to Japan. There's a station blackout rule that has
18 required every plant in the country to analyze what the plant response would be if
19 it were to lose all alternating current so that it could respond using batteries for a
20 while, and then have procedures and arrangements in place in order to restore
21 alternating current to the site, and provide cooling to the core.

22 As I mentioned earlier, there's a hydrogen rule, which requires
23 modifications to reduce the impacts of hydrogen generated for beyond-design
24 basis events and core damage. There's equipment qualification rules that
25 require equipment, indication equipment, as well as pumps and valves, to remain

1 operable under the kinds of environmental temperature, radiation conditions that
2 you would see under a design basis accident. And then, going directly to the
3 type of containment design that the plants in Japan of highest interest have,
4 we've had a Mark I Containment Improvement Program since the very late
5 1980s, which had installed hardened vent systems for the containment cooling
6 and fission product scrubbing for all BWR Mark I's, as well as enhanced reliability
7 of the automatic depressurization system.

8 I also mentioned earlier that we have emergency preparedness and
9 planning requirements that provide ongoing training, and testing, and evaluations
10 of emergency preparedness programs, in coordination with our federal partner,
11 FEMA. And that entails extensive interaction with state and local governments,
12 as those programs are evaluated and tested on a yearly basis.

13 Over the near term, the NRC activities are -- we will -- concurrent
14 with the event evaluation that we're doing through the Operations Center and the
15 team that's in Japan, we will be enhancing inspection activities through
16 temporary instructions to our inspection staff, including the resident inspectors
17 and the region-based inspectors in our four Regional offices, to look at the
18 readiness to deal with both the design basis accidents and the beyond-design
19 basis accidents.

20 We've already issued an information notice to the licensees to
21 make them aware of the events, and what kinds of activities we believe they
22 should be engaged in, to verify their readiness. And then we, every single day,
23 assess whether or not there is some additional regulatory action that needs to be
24 taken immediately, in order to address the information that we have, to date. The
25 temporary inspection I've referred to is verifying that the capabilities to mitigate

1 conditions that result from severe accidents, including the loss of significant
2 operational and safety systems, are in effect and operational. They're verifying
3 the capability to mitigate a total loss of electric power to the nuclear plant.
4 They're verifying the capability to mitigate problems associated with flooding, and
5 the impact of floods on systems both inside and outside of the plant. And they're
6 identifying the equipment that's needed for the potential loss of equipment due to
7 seismic events appropriate for the site, because each site has its own unique
8 seismic profiles.

9 The information that we gather from this temporary inspection will
10 be used to evaluate the industry's readiness for similar events, and aid in our
11 understanding of whether additional regulatory actions need to be taken in the
12 immediate term. For a near term effort, we are beginning, very soon, a 90 day
13 effort, that will evaluate all of the currently available information from the
14 Japanese event, and look at it to evaluate our 104 operating reactors' ability to
15 protect against natural disasters, to evaluate the response to station blackouts,
16 severe accidents and spent fuel accident progression, look at radiological
17 consequence analysis, and also look at severe accident management issues
18 regarding equipment.

19 I expect that, coming out of this, we'll have the development of
20 some recommendations for generic communications, either to make sure that the
21 industry has a broad understanding of the events and the issues, as best we
22 understand them. But also, as I mentioned earlier, that we would evaluate
23 whether or not some regulatory action, perhaps in the framework of an order,
24 would be required, in order to require the licensees to take some actions that
25 they have not already done. I expect that this 90 day effort will include a Quick

1 Look 30 day report to the Commission, and of course we stand ready to brief the
2 Commission as you desire.

3 In order to accomplish this Quick Look report, I think we will have
4 limited stakeholder involvement in this activity, and that it will be done
5 independent of industry efforts that might be ongoing. The idea is to just get a
6 quick snapshot of the regulatory response and the condition of the U.S. fleet
7 based on whatever information we have available. You know, I recognize that
8 we have limited information now. More and more information will become
9 available to us as we go along. But we wanted to do at least this Quick Look
10 report, beginning very soon. And of course, consistent with the Commission's
11 practices, the results of this report will be made public.

12 On the longer term, we'll be developing lessons learned that are
13 somewhat dependent on when we begin to get a better understanding of the
14 events and the results of the earthquake and tsunami in Japan. So, to some
15 degree, it's difficult to precisely state when the start date for this longer-term
16 review will begin. The review may include the involvement of other federal
17 agencies, but it will certainly include interaction with those other federal agencies,
18 because there's, obviously, the issue of emergency preparedness is a prime
19 example of where we would interact with FEMA to have an effective review. And
20 we would identify the lessons learned that need to be incorporated into any
21 ongoing, long term agency action.

22 We'll evaluate all the technical and policy issues to identify
23 additional research, or generic communications, changes to our reactor oversight
24 program, potential new rulemakings, adjustments to the regulatory framework
25 that should be conducted by the NRC. As I said, we'll evaluate inter-agency

1 issues, and also look for applicability to non-operating reactor facilities. I expect
2 this longer-term report to have substantial stakeholder involvement, and the
3 outcomes are likely to be along the lines of generic letters, bulletins, and potential
4 rulemakings. So, in conclusion, I want to make it clear that we continue to make
5 our domestic responsibilities of licensing and oversight of the U.S. licensees our
6 top priority. There is an immediate short term and long term evaluations that are
7 beginning, and that they will be influenced by our understanding of the events in
8 Japan. With that, that concludes my presentation. I'm ready to answer any
9 questions.

10 CHAIRMAN JACZKO: Well, thank you, Bill, for that very thorough
11 presentation. We have a proposal in front of the Commission now to consider
12 the options for the short term and the long term reviews, so we'll take a look at
13 that and provide response in fairly short order. I would, again, just want to
14 reiterate my thanks to the work that you and your team have done over the last
15 several days, to deal with this situation, and the -- emphasize the importance of a
16 systematic and methodical review, so that we do make sure that we approach
17 these issues, and really get the facts, and make sure that we don't move in a
18 direction that is based on early information, which often tends to be confusing,
19 and sometimes conflicting. So I appreciate the work that you've done to this
20 point. And I don't have any specific questions, at this time, but I would turn to
21 Commissioner Svinicki to begin with some questions and comments.

22 COMMISSIONER SVINICKI: Thank you, Mr. Chairman, and thank
23 you, Bill. I second the Chairman's comments about the tremendous efforts that
24 you and all of the NRC staff members have made in supporting the agency's
25 reaction to this event. There is a lot that we don't yet know, and so that becomes

1 a context, really, for the types of questions that we're able to ask about this event
2 today. Very generally, I would ask you, in the staff's expert assessment, this
3 morning, do you believe that the events occurring at Fukushima have stabilized,
4 or is it reasonable to expect that events there will continue to be dynamic in the
5 days and weeks to come?

6 MR. BORCHARDT: In my view, the fact that off-site power is close
7 to being available for use of plant equipment is, perhaps, the first optimistic sign
8 that we've had, that things could be turning around. We believe that the spent
9 fuel pools on Units Three and Four, which had been two components that were
10 of significant safety concern, that the situation there is stabilizing, that the
11 containment in three, all three Units One, Two, and Three appear to be
12 functional, and that there's water being injected into the reactor vessels in Units
13 One, Two, and Three.

14 So I would say optimistically, things appear to be on the verge of
15 stabilizing. This has been a very challenging event for us to understand the
16 exact situation, because, as was alluded to, the information is sometimes
17 conflicting, it's certainly not at the level that any engineer would like to have in
18 order to do a thorough analysis, so we've spent a lot of the time trying to piece
19 together our best understanding. But that would be my personal assessment of
20 the situation on site now.

21 COMMISSIONER SVINICKI: Is it fair to say from that, then, that,
22 based on what we understand now of the needs that most urgently need to be
23 addressed there at the site, that those are being addressed, and that they have
24 the status that you just described to me? Those are, of course, the items of
25 highest interest. But it sounds also like, in the days and weeks to come, we will

1 certainly discover other conditions and things at the site, of perhaps a lower level
2 of priority that we just don't know about right now.

3 MR. BORCHARDT: Yes. The radiation releases and the dose
4 rates that we've seen on site, I think, were primarily influenced by the condition of
5 the Units Three and Four spent fuel pools. And the water inventory questions of
6 whether or not there was some fuel that was uncovered in the spent fuel pool
7 was of significant concern. TEPCO, the licensee, and the Government of Japan
8 have been making a concerted effort to address those issues. So that we're
9 aware of.

10 I don't believe we have anywhere near a clear understanding of
11 what the plant conditions are like within the reactor buildings. So, what kinds of
12 electrical cabling has been damaged, what kinds of pumps and valves remain
13 operable, is a significant unknown right now.

14 COMMISSIONER SVINICKI: Okay, thank you. You gave a very
15 high level chronology of the events that occurred, as we know them. And it really
16 ends up being a narrative of three events that are related to each other. First, of
17 course, being the earthquake, the seismic event. Second, the tsunami, or, as we
18 might have it in the United States, a flood surge, or some other flooding event,
19 followed by the loss of power.

20 In terms of what we know now, and given that there are these three
21 events in succession, do you think that our regulatory focus right now, for the
22 review we're doing, is where it needs to be?

23 MR. BORCHARDT: Yes, I'm quite confident. We've looked at all of
24 the information that we're getting from Japan. We've looked at the design basis
25 for the U.S. reactors. We continue with the inspection program, and we have a

1 high degree of confidence that the 104 currently operating reactors, there's an
2 adequate basis to assure adequate protection.

3 COMMISSIONER SVINICKI: Thank you. There's been some
4 discussion of what we call Generic Safety Issue 199. And Generic Safety Issues,
5 that's a program that we have at NRC for the continual evaluation of various
6 safety-relevant issues. Could you talk a little bit about the ongoing nature, this is,
7 Generic Safety Issue 199, was ongoing prior to the event in Japan. Could you
8 talk about what was occurring there, and how the events in Japan may alter how
9 we approach that generic safety issue, going forward?

10 MR. BORCHARDT: Occasionally, I think it's every five years or so,
11 the USGS does a review of information which impacts the U.S. Government's
12 understanding of seismic frequencies and issues associated with seismic.
13 Recently they put out a report that talked about the seismic information for the
14 East, the Central and Eastern United States. That information has been given to
15 the industry. There's now both industry and NRC evaluation of that information
16 to see if this new information, and in some places it's an increase in the
17 frequency, expected frequency of a seismic event, would cause us to have to
18 change the seismic design basis for the plants.

19 We did a, as we do every time we get any kind of new information,
20 seismic or otherwise, we do a quick look to make sure that we don't believe
21 there's any immediate information or any immediate need to take any regulatory
22 action. If there was, we would certainly do that through the immediate imposition
23 of new operating guidelines, or new systems, or potentially, even, requirement to
24 shut the reactor down, until the issue was addressed.

1 In this case, we did that review. We found no reason to take any
2 immediate regulatory action. And so this is an ongoing review. I don't believe
3 that what we've learned from Japan would cause a different type of analysis. It
4 certainly puts a broader, brighter spotlight on the work we're doing, and that
5 follow-up. But I'm confident that the approach we've been on is the right
6 approach.

7 COMMISSIONER SVINICKI: You described our role in the inter-
8 agency response, and NRC-specific actions. Are we cognizant of, and working
9 to understand and make sure that our efforts do not conflict with, any industry-to-
10 industry systems that is going on? I'm not aware of Tokyo Electric Power
11 reaching out to the U.S. nuclear industry, or nuclear utilities, since this is a
12 technology that we have in the United States. Do we maintain a cognizance of
13 that so that we can make sure that all efforts are coordinated?

14 MR. BORCHARDT: We are aware that the industry-to-industry
15 interaction has been ongoing at one level. Of course, there's many vendors and
16 companies in the United States that have had ongoing business relationships
17 with TEPCO, and the other generating companies in Japan. So at the working
18 level, it has been going on ever since the event, and prior to the event.

19 At a higher, coordinated industry-level, I would say we are still in
20 the formulative stages of that interaction. We have had some discussions with
21 the industry, U.S. industry, it's still evolving. So we're cognizant of what's going
22 on, and trying to help, in a U.S. government role, facilitate the contacts, if you
23 will, between the U.S. and the Japanese companies, in any way that we can.
24 Because we think it would certainly be a potential benefit to TEPCO.

1 COMMISSIONER SVINICKI: Thank you. And my last question to
2 you is that, you mentioned our ability to issue very rapidly various types of
3 generic communications to the industry, and in your prepared remarks you talked
4 about the fact that we had already issued, I believe last week, an information
5 notice. Could you describe generally, in that notice, what are we alerting the
6 U.S. reactors to?

7 MR. BORCHARDT: Well, the main purpose, from my perspective,
8 and I might ask NRR to supplement my answer if I'm not quite complete, was to
9 have a regulatory follow-up on the activities that we understand the industry has
10 taken on their own to verify that the plant procedures and equipment for severe
11 accidents, for the types of things I discussed that came out of the 9/11 event: that
12 all of those pieces of equipment, temporary hoses, fittings, procedures, that all
13 those things are, in fact, still in place, that the operators are cognizant of them,
14 that they've been trained for whatever reason, to make sure that they haven't
15 fallen into disuse because they haven't been used.

16 So it was really a regulatory verification that the industry's initiatives
17 on this front have, in fact, been taken, and that we will be following up on the
18 results of those assessments, and doing our own sampling check, as we always
19 do.

20 COMMISSIONER SVINICKI: Okay, and so those were the items,
21 based on what we know now, that we identified as being of the highest interest,
22 at least in the immediate term, okay?

23 MR. BORCHARDT: Yes.

24 COMMISSIONER SVINICKI: Thank you. Thank you, Mr.
25 Chairman.

1 CHAIRMAN JACZKO: Did you have any other questions?

2 Commissioner Apostolakis.

3 COMMISSIONER APOSTOLAKIS: Thank you, Mr. Chairman. Bill,
4 you mentioned that the -- well, first of all, we know that there is a number of Mark
5 I BWRs in the United States, which is the same design as those in Fukushima.
6 But you also said that in the recent past we hardened the venting valves of the
7 containment. Have the Japanese done this?

8 MR. BORCHARDT: That, we're not clear on. I'm not sure; I can't
9 really answer that question.

10 COMMISSIONER APOSTOLAKIS: I guess the question is, if they
11 had done it, would that have affected the accident? And in what way?

12 MR. BORCHARDT: Well, it would not have affected the loss of off-
13 site power, which is, right, the initiator. The hydrogen explosion aspect, though,
14 possibly, is where the hardened vent would happen. There's two vent paths off
15 of the U.S. Mark I containments. The preferred vent path takes suction, if you
16 will, or has a release path from the airspace above a pool of water that's in the
17 basement, it's in the torus of the Mark I containment, and that would allow for the
18 steam that went into the torus to be scrubbed of fission products, so you would
19 have a release; it would relieve the pressure, which is the main objective of the
20 vent, is, you want to maintain the containment integrity. And it's preferable to
21 vent it on purpose to get the pressure so that you don't have a catastrophic
22 failure of the containment.

23 And so that release path is exterior to the plant. So it's at least my
24 belief that you wouldn't have the hydrogen accumulation in the upper levels of
25 the reactor building, which we believe is the cause of the explosions. Now, the

1 spent fuel pools on these designs are also on that same level, on the upper level
2 of the reactor building. So it's, the hardened vent wouldn't do anything to help
3 hydrogen that came from the spent fuel pool

4 COMMISSIONER APOSTOLAKIS: I see, okay. Now you also
5 mentioned that we have extra equipment for beyond-design basis accidents that
6 were installed, so-called B.5.b that were installed after the September 11
7 attacks. Did the Japanese have any of those?

8 MR. BORCHARDT: Again, I'm not sure. I -- really, we're trying to
9 get information, but I am not personally aware of the situation in Japan.

10 COMMISSIONER APOSTOLAKIS: Okay. Thank you. Some
11 people are asking why did the Germans shut down their plants, or some plants,
12 after the accident, and we did not? Are we less prudent than the Germans?

13 MR. BORCHARDT: No, I am not aware of the basis for the
14 German decision to do that. I'm 100 percent confident in the review that we've
15 done, and we continue to do every single day, that we have a sufficient basis to
16 believe, to conclude that the U.S. plants continue to operate safely. So I -- we've
17 asked ourselves the question every single day: Should we take a regulatory
18 action based upon the latest information? And, because of the kinds of things
19 that I outlined in my presentation, we have not reached the conclusion.

20 COMMISSIONER APOSTOLAKIS: Thank you. Now, of course,
21 the seismic risk is at the forefront of the news. And we hear that -- well, first of
22 all, our press releases emphasize that the seismic design is based on the
23 horizontal ground acceleration at the plant. But, of course, most people think in
24 terms of the Richter scale. And also we hear that the earthquake of magnitude 9
25 at Fukushima had not been anticipated.

1 Now, we say that in the United States, we design the plants by
2 looking at the historical record, and then by, we add margins. Now I understand,
3 or believe, that the strongest earthquakes in the United States have occurred
4 east of the Rocky Mountains in the 1800s, and the magnitude was between 7
5 and 7.7 on the Richter scale, something like that. So immediately you get the
6 question, then, yeah, okay, you design against those, but look at Japan: What if
7 you had an earthquake of magnitude 9? How does one answer that question? I
8 mean, you can always ask, what if an earthquake of 9 and a half occurred. I
9 mean, is there a rational way of addressing that?

10 MR. BORCHARDT: Well, my explanation is one that I know you
11 understand this, but we look at faults around the U.S., we have that information.
12 We look at the historical record, look at what the maximum earthquake has been,
13 and then, as with everything we do, we add margins. But we also look at the
14 specific location in relation to the fault, and consider the kinds of soil and rock
15 formations that are between the fault location and the site, and do an analysis to
16 see what is the ground motion that would actually be seen at this site. And we
17 design for an earthquake of a certain size, or a, you know, I'm falling into the trap
18 of saying "an earthquake of a certain size", of a ground motion of a certain
19 magnitude.

20 But then, having said that, all of these other things: severe accident
21 management guidelines, the B.5.b procedures, we have programs in place,
22 equipment in place, that says, even if we were wrong, and the plants suffered
23 this kind of serious event, we have, in fact, the activities, the equipment, ready,
24 and practiced to respond to protect public health and safety. So I don't know if I

1 should throw a seismic lifeline here, if you wanted to get into any more detail on
2 seismic issues.

3 CHAIRMAN JACZKO: And just say your name.

4 ANNIE KAMMERER: Thank you. My name is Dr. Annie
5 Kammerer, I'm in the Office of Research. I think I'd like to make a couple of
6 points. The first point is related to the ground motion in Japan. Recently, starting
7 in 2006, the Japanese regulatory agency performed a study in which they looked
8 at increased hazard, perception of hazard at the plants. And recently themselves
9 did a reevaluation of the impact that potential increased hazard at the facilities,
10 and actually were in the middle of this when this event occurred. As a result, a
11 number of modifications were made to the plants.

12 At this point, it's not clear exactly what modifications the Fukushima
13 plant had already had implemented. However, the ground motions for which the
14 plant was reevaluated, is about .62G; the original design basis was about .37G.
15 Based on the preliminary information that we have, .62G is in the range of the
16 ground motions that were actually experienced by the plant, although they came
17 from a different earthquake than was anticipated. The ground motions that, for
18 which the plant was assessed, was a 7.1, very close to the plant. That's what
19 produced the ground motions of 6.2.

20 So, one thing that we believe is that the ground motions at the
21 plant, even though it was a different event, were not out of the range that they
22 had already considered. It's less clear with regard to the tsunami. Currently, the
23 Japanese Society of Civil Engineers is finalizing guidance, probabilistic tsunami
24 hazard assessment guidance for Japan. And it was anticipated that the
25 Japanese regulator would do a similar study for a tsunami hazard assessment at

1 the plants once that was completed. Unfortunately, because the guidance has
2 not yet completed, it's not believed that they initiated that work.

3 So just to clarify, that even though this particular event was larger
4 on the subduction zone than was anticipated, it probably didn't greatly exceed the
5 ground motions. The one exception to that may be in the long period range.
6 Because if you have a larger amount farther away, you get more long period
7 content than would be anticipated from a 7.1 close in. The second question, or
8 the second point is in regard to a seismic hazard in the United States. As was
9 mentioned, we are undertaking a program, Generic Issue 199, which is looking at
10 the potential impact to assess risk, given a perceived increase in the ground
11 motion hazard in the Central and Eastern U.S., which was initiated by the new
12 USGS seismic hazard mapping work that was done. And it's important to note
13 that when the modern analysis techniques that are used are probabilistic
14 techniques, those are the basis of the maps, and they account for basically all
15 sources and the potential for all the different magnitudes that are capable of
16 those sources, up to and including maximum magnitude events which, in many
17 cases, exceed that which we have seen in the historic record. It was mentioned
18 that the largest, the most widely-felt earthquakes in the U.S. were the 1811-1812
19 New Madrid events, which we currently believe were about a magnitude 7. And
20 yet, we do look at, particularly in portions of the crust of a potential for exceeding
21 that. Of course, we also account for the likelihood that that event occurs. And
22 that also accounts for background seismicity, which is common in the east, which
23 is seismicity which cannot be attributed to a specific fault.

24 In fact, it's important to note that seismicity in the Central and
25 Eastern U.S. tends to be in what we call seismic zones, which are not directly

1 attributable to a fault. And we account for all of the hazard in the seismic zones.
2 One of the questions which has come up repeatedly is, how many plants are
3 near faults? Or, how many plants are in moderate or high seismicity regions?
4 And that's a very challenging question to answer, because these seismic zones
5 are not well-defined boundaries. The faults that were the causative faults in the
6 1811 and 1812 earthquakes have never been identified, in part because they're
7 under a very deep -- the very deep sediments in the Mississippi region. And so
8 we have to account for the uncertainty in the location, we have to account for the
9 uncertainty involved in the maximum magnitudes. And all of that is incorporated
10 in the hazard analyses that we undertake.

11 The Generic Issue Program is using the most state-of-the-art types
12 of analyses, which do look at earthquakes, and include earthquakes beyond the
13 design basis. So, in that way, we directly account for those potential sources and
14 those potential earthquakes, which are not under our current licensing basis.
15 And we're currently assessing the risk from the possible beyond-design basis
16 events.

17 CHAIRMAN JACZKO: Well, thank you for that, Annie.
18 Commissioner Apostolakis, did you have additional comments or questions?

19 COMMISSIONER APOSTOLAKIS: Yeah, I'd like to make one
20 comment and then ask my last question. Annie mentioned several times,
21 probabilities, even after we do the probabilistic analysis, we still have Defense in
22 Depth in mind, which is the current way of looking at things. So it's not just, what
23 is the most likely event that we anticipate, we always ask that question that Mr.
24 Borchardt mentioned: what if we are wrong? And we take additional measures.

1 So I think that's very important, for people to understand it. Because, you know,
2 probabilities, sometimes, are easy to attack.

3 One last question, thank you Annie. As you mentioned, the
4 damage in Fukushima was not really caused by the earthquake; it was the
5 tsunami that came afterwards. So the question now is: when we license our
6 plants here, are we considering this one-two punch? Are we considering an
7 earthquake followed by a tsunami, as appropriate? Or a major fire, or a flood,
8 because tanks holding water fail? Because this secondary event seems to be,
9 now, very important, and we have to account for it. So how are we approaching
10 this issue in the United States?

11 MR. BORCHARDT: Well, the design basis includes many different
12 analyses. I would just say one thing about the earthquake in Japan. We don't
13 know what the impacts of the earthquake are inside of the reactor buildings,
14 specifically, that's where most of the equipment of interest to us would be
15 located. It may have survived perfectly well, and stayed perfectly functional, or
16 there may be damage that we just don't know about. So we need to see what
17 the inspection results are, once they have access to the plant.

18 But our reviews for the U.S. include, it's always very site-specific.
19 So, you know, for earthquakes, if they are in a very soft soil environment, there's
20 not a very challenging review that's required, or analysis that's required on
21 earthquakes. But it might be that you need a storm surge for a hurricane, or a
22 storm surge for a tsunami. But there are multiple -- you don't take every possible
23 current event and pile them all together into one event. So it's done more on an
24 event by event basis, so I don't know if --

25 COMMISSIONER APOSTOLAKIS: [inaudible] or something else?

1 CHAIRMAN JACZKO: Well, I think that, and Eric, maybe you could
2 just answer the question. I think it's, more generally, how do we -- do we
3 consider separate design basis events -- do we consider design basis events
4 separately, or do we consider all design basis events simultaneously on a plant?

5 MR. LEEDS: Eric Leeds, Director of the Office of Nuclear Reactor
6 Regulation. As Bill mentioned, we take into account whatever natural
7 phenomena could occur at a particular site, whether it's a hurricane, a tsunami,
8 an earthquake, a tornado, what have you. And we have them analyzed site-
9 specifically. Now, I'm not exactly sure if I understand the question directly. Are
10 you asking, a seismic event followed by a tsunami? Well, I know that we
11 analyzed for a tsunami, we analyzed for the maximum storm surge, as Mr.
12 Borchardt mentioned, and also what kind of a run-out would happen. Typically,
13 tsunamis are triggered by an earthquake. So, one or the other, we would
14 analyze for that. And we've done that for our plants on the coast.

15 COMMISSIONER APOSTOLAKIS: Thank you, Mr. Chairman.

16 CHAIRMAN JACZKO: And I would just echo, I think, Bill's
17 comments. We are at a very early stage now, too, and detailed information, it's
18 probably going to be some time until we have it. And so exactly the impacts of
19 the tsunami and/or the earthquake and what their effects on the plant were will
20 probably still take some time to understand. Commissioner Magwood?

21 COMMISSIONER MAGWOOD: Thank you. Good morning, Bill.

22 MR. BORCHARDT: Good morning.

23 COMMISSIONER MAGWOOD: Did you get some sleep this
24 weekend.

25 MR. BORCHARDT: Not much.

1 COMMISSIONER MAGWOOD: Not much? I'm sorry. You'll get
2 there at some point. There's been a lot of discussion in the media about -- that
3 compares what's happening in Japan to Three Mile Island. And I, as I look at
4 this, and again, we're so early in this, I tend not to think as much about Three
5 Mile Island as I do 9/11. And one reason I think about that is because it seems
6 to me that there are, certainly, a lot of lessons learned, a lot of technical details
7 we'll have to sort out over time. But I wondered, also, whether, as in the case of
8 9/11, is there a major conceptual "Ah-ha!" that's sitting out there in front of us?
9 And I want to make sure we don't miss that forest while we're looking at all these
10 trees.

11 And in the case of 9/11, it wasn't just simply, you know, that we
12 need to do a better job protecting, you know, airplane cockpits, and lots of other
13 security upgrades. It was a conceptual "Ah-ha!" that the threat is a lot different
14 than we thought it was. Do you, as you look at this at this early stage, do you
15 see a bigger message out there that we should be thinking about?

16 MR. BORCHARDT: I don't see a significant weakness now, but
17 that's why we need to do this Quick Look review. And my personal view is that
18 what we need to do is take some very experienced people that are both within
19 the staff, and maybe take some even recently retired people that have expertise
20 in the broad areas of design review and licensing, and let them just focus on the
21 question of, is there something here that causes us to question these, the way
22 we've applied Defense in Depth, and being risk-informed, and the various
23 barriers of radiation release protection, and those kinds of things, and evaluate
24 whether or not there's something different that needs to be done.

1 It hasn't actually occurred to me, if anything, it's given me a bit of a
2 confidence, if you will, that all of those redundancies, and all of our processes,
3 are paying off. I mean, it was maybe in the view of some stakeholders overly
4 conservative, the way we've approached it, but I think we're seeing the value and
5 the benefit of that approach that we've used for the last 35 years.

6 COMMISSIONER MAGWOOD: I appreciate that, and I agree with
7 it. Let me give you some, just sort of, thoughts about where I think there might
8 be some larger issues to think about. And that is, in looking at, as we've
9 described them, again, we don't know all the details yet. But we do have the
10 sense that the plant seemed to survive the earthquake. And we do have the
11 sense that the tsunami's disabling of the backup power systems led to the
12 situation that followed. But even beyond that, there's the fact that there was so
13 much difficulty in bringing resources to the plant to recover from that situation.

14 When you look at our plants, we certainly have done things in B.5.b
15 and other things to upgrade our ability to recover from site blackout; and we're
16 going to be looking at those issues. But if you lose a lot of infrastructure, if you
17 lose the ability to get to a site, if you lose hundreds of miles of transmission line,
18 if you lose the ability to have rail transport, to move equipment around, that's
19 something I don't know that there's been a lot of thought about.

20 And I wonder if you could reflect on that for a moment, because
21 when I look at this event, I see a significant struggle over -- especially over the
22 early part of this, to get the right resources to the plant to be able to recover from
23 this accident. And even today, we still are struggling to hook up the AC power to
24 Units One and Two, as you've described. When you think about this, and again
25 we'll look at this in great detail as we go forward, do we even have the regulatory

1 scope to cover all the ground that needs to be covered, to assure that the
2 infrastructure's in place to be able to recover from an accident like this?

3 MR. BORCHARDT: I think there's a couple levels that maybe I'd
4 like to touch on in response to that question. The first is, and I have no idea what
5 the situation is in Japan regarding their regulations and what they have in place,
6 so I'm not implying whether they had it or didn't have these kind of things. But in
7 the United States, I mentioned the station blackout rule, which is a rule that
8 requires an analysis of what would happen at a plant and its coping strategy for
9 dealing with a complete loss of all AC power. So that assumes that the diesels
10 don't -- that you'd lose the transmission lines and the diesels don't start, and then
11 they have to do an evaluation and it's a coping study, how they would be able to
12 restore the plant. That has resulted in various approaches at different sites.
13 Some have a gas turbine that is on the site that could be very quickly hooked up
14 into the grid -- not into the grid, into the plant. There's others that have non-
15 safety-related diesel generators. There are plants that have diesel fire-pumps so
16 that there is a backup to a backup to a backup way to inject water into the core
17 and into the spent fuel pool. So there's a regulatory construct that's required and
18 mandated that type of activity.

19 From a U.S. Government perspective, coming out of 9/11, we had
20 the Department of Homeland Security, which is positioned to orchestrate the
21 entire federal response to an event of magnitude that, you know, you might be
22 suggesting, that would happen so that the full resources of the U.S. Government
23 would be able to use different resources to get temporary equipment to a site in
24 order to provide electrical power, temporary diesel generators, that kind of thing.

25 And then the backstop for all of that, and I'm now leaving the kind of

1 federal regulatory requirement perspective, is that the U.S. industry, I think, is
2 unique in the world, but also within industry in this country in that while on the
3 one hand they're competitors, on the other hand they share operating
4 experience, they have programs that they all contribute to, and they have an
5 inventory of spare parts and equipment that can be very quickly brought to bear
6 in responding to this kind of an event. So this is outside the regulatory purview, I
7 want to make clear, but that is yet another backstop that would help a site that
8 had a similar kind of problem respond to it in a quick and effective manner.

9 COMMISSIONER MAGWOOD: I appreciate that, and let me also
10 echo your somewhat positive words about the industry. I think in this particular
11 instance, actually, I think the industry in the U.S. and internationally has
12 responded very, very well to this. I particularly congratulate INPO's efforts,
13 through WANO, to work with international partners and also to take positive
14 action here in the United States. I think they've done a good job, and I think NEI
15 and others have worked together and I think individual companies have done a
16 lot, so I congratulate the industry for reacting that way.

17 Let me move on to a little bit different subject. We've talked a little
18 bit about hydrogen already this morning, and the measures we have to deal with
19 hydrogen. Is it your understanding that all the hydrogen that led to the
20 explosions came from the spent fuel?

21 MR. BORCHARDT: I wouldn't want to hazard a guess. It was
22 certainly a likely source; whether it was all of it or not, I couldn't guess.

23 COMMISSIONER MAGWOOD: You've talked about this a little bit,
24 but I want to give you a chance to sort of give a little bit more of a holistic

1 response to this. What measures are in place to prevent hydrogen from
2 collecting and exploding in U.S. plants? Mark I's or others.

3 MR. BORCHARDT: Well, the hardened vent, of course -- the U.S.
4 design approach is to protect the containment. It's to ensure the integrity of the
5 containment, and if you can do that, even if you have fuel damage, then you can
6 prevent the uncontrolled release of radioactive materials into the environment.
7 And so this is -- Three Mile Island, for example, had core damage, a significant
8 amount of core damage, yet the radiological releases were very limited from
9 Three Mile Island, so there was negligible health effect from that accident. So
10 hardened vents will allow the primary containment to stay intact and that's
11 probably the single most important thing.

12 The other thing to maintain the containment is, for this particular
13 design of containment, we've required, I think since the late 80s again, inerting of
14 the containment. So it's filled with nitrogen, so if you don't have oxygen in the
15 containment, even if you did have hydrogen in there, you're not going to have an
16 explosion or a fire. So I think those are the two, probably the biggest ones, and I
17 don't know if there's anything that we need to add.

18 COMMISSIONER MAGWOOD: Appreciate that. One more
19 question, Mr. Chairman. Also to just give you a chance to clarify. I know there's
20 a lot of chatter in the press over the weekend about the impact of 50-mile
21 evacuation zones around U.S. nuclear plants. Could you sort of give the NRC's
22 position on what the emergency planning requirements are, and why we're
23 confident in what we have today? Can you please elaborate?

24 MR. BORCHARDT: We have, as part of the emergency
25 preparedness construct in this country, a 10-mile emergency planning zone that

1 completely encircles every reactor plant in the country. That, in coordination with
2 FEMA, who has an offsite emergency-preparedness role throughout the country,
3 is routinely practiced. We have models that would do an analysis of what the
4 release paths are; we take into account the meteorological conditions; and the
5 NRC, I should be clear, the NRC does not make the recommendations regarding
6 evacuation or any other protective action guidelines; that's the responsibility of
7 the state government, so it would be the governor that would ultimately be
8 making that decision. But we're in a position to provide independent assessment
9 and advice to the governor in those kinds of circumstances.

10 The situation that led to the 50-mile guidance in Japan was based
11 upon what we understood and still believe had existed, that there was degraded
12 conditions in two spent fuel pools at the site, and in all likelihood some core
13 damage in three of the reactor units. Based on the situation as we understood it
14 at that time, we thought it was prudent to provide the recommendation to the
15 ambassador to evacuate out to 50 miles in Japan. It was not based on the
16 existing radiological conditions, but what at that time was a possibility. And so
17 we thought it was the prudent, conservative suggestion. If those conditions
18 existed in the United States, we would have made the exact same
19 recommendation. But the idea that there might be some misunderstanding, that
20 because we have a 10-mile EPZ, that would be the extent for what we would
21 consider and what our emergency planning recommendations would be limited
22 to, is not true at all. We would have done the exact same kind of analysis and
23 gone through the same thought process to consider extending evacuation or
24 whatever protective measures we thought were appropriate.

1 COMMISSIONER MAGWOOD: Thank you. Thank you, Mr.
2 Chairman.

3 CHAIRMAN JACZKO: Commissioner Ostendorff.

4 COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman. Bill,
5 again I thank you for your leadership in this effort, and for the hard work and
6 professionalism of your teams. It was helpful in your opening statement, where
7 you talked about the history of the NRC post-Three Mile Island, post-9/11, as to
8 what steps or additional measures were considered or in fact implemented; and
9 so I think that history is very relevant to the near-term and longer-term efforts.
10 Certainly there's Hurricanes: Andrew, Katrina that this country has faced. Also
11 provide data points for various steps taken, whether they be specific to the
12 nuclear field or external to the nuclear field. Does any of the experience from
13 your career at NRC, do you have any significant lessons learned from the
14 process, not the substantive technical details, but the process that was employed
15 following these other significant events that would help inform the task force
16 execution of its mission?

17 MR. BORCHARDT: Well I think it's very important that the task
18 force keep the broad perspective of the regulatory framework that exists within
19 the NRC, and the legal framework that exists within the United States. Because
20 there is a temptation to, I think, try to pile in every good idea that exists into
21 something that becomes unmanageable, and in the ultimate could actually end
22 up being counterproductive to safety.

23 There was a degree of that, in my opinion -- this is only speaking
24 my personal opinion -- after Three Mile Island, because when I started with the
25 agency in 1983, we were still in the midst of following up the actions from the

1 Three Mile Island action plan. It was a NUREG-0737, and anybody who started
2 in the NRC has that number burned into their brain because we spent enormous
3 amounts of resources following up on those activities. Some of those fixes that I
4 alluded to were absolutely instrumental in improving the safety in this country.
5 Some were, I believe, if we had carried them all out, might have actually been
6 counterproductive in a way, just not contributed to safety. They might have been
7 a good idea in somebody's mind. So there needs to be -- after you go through
8 the brainstorming and identification of all possible things to change, I think there
9 needs to be a good evaluation, thorough evaluation, of what's the right thing to
10 do, and in what kind of sequence and in what kind of timing.

11 COMMISSIONER OSTENDORFF: Okay. Well I'll just make two
12 comments on that. One thing, just for information, you may be aware of this, but
13 about a year ago the National Academies undertook a significant study for about
14 9 or 10 federal agencies, to look at disaster resilience in this country, specifically
15 from the context of inter-agency coordination, roles and responsibilities. But
16 nothing there was, or to my knowledge is currently nuclear-specific. The extent
17 of interagency coordination for various types of events in this country is a prime
18 subject of that study. There may be some value in looking at that.

19 And refer to Commissioner Magwood's questioning on the
20 transportation logistics support, which I completely agree have been issues here
21 so far, in this particular response. One might take note of the Department of
22 Defense's efforts, since the loss of the U.S.S. Thresher back in 1963. There's
23 been a very operationally ready deep-submergence rescue vehicle, DSRV, on
24 standby close to airplanes on the East and West Coast of the United States to
25 provide a response. So other agencies, the point is, have gone through similar

1 analogues in looking at how they might deal with particular responses, and that's
2 something just to note.

3 Also, kind of maybe staying a little bit on the big-picture historical
4 nature of some of the prior NRC responses to these big events, it also strikes me
5 that perhaps the audience or the recipients of these reports will be representing a
6 broader cross-section than typical Commission meetings. Certainly we have
7 nuclear industry, we have many of the same stakeholders from issue to issue,
8 but in my personal opinion is that this is one where how we communicate to John
9 Q. Public, the person that doesn't have a stake in the industry or is not part of
10 one of the normal stakeholder groups, but also deserves and needs to receive a
11 reply that they can understand, is really essential. Is there anything from your
12 prior experience here at the NRC, either 9/11 or Davis-Besse or the 2003
13 blackout, that you think would be in your initial thoughts on how we communicate
14 so that people in the American public understand what the results are of these
15 near-term and longer-term efforts?

16 MR. BORCHARDT: Well, and again this is just my view, my
17 assessment, I think that especially in the long-term review that we do, we need to
18 build in a meaningful engagement with all the stakeholders. They have an
19 enormous capability to understand the most technical issues. Sometimes we
20 think that capability doesn't exist, but it's in fact not true. And we have had
21 enormously valuable input from a wide range of stakeholders. This is a little bit
22 off of event response, but when we established the reactor oversight program --
23 we did it 10 or 12 years ago -- we used just that kind of an approach. We
24 brought in all kinds of different stakeholders from all different perspectives, and it
25 was a very impressive end result that had everyone's buy-in. People who came

1 from pro-nuclear, anti-nuclear, and they all agreed that this was a good approach
2 to perform regulatory oversight. I think the same kind of mindset is important to
3 enter into this long-term activity, and start at the beginning. Where we get into
4 trouble as a regulator is when we have our mind made up, or even if we don't
5 have our mind made up, there's a perception we already have our mind made
6 up, and then we begin the engagement. So I think we need to do it right from the
7 very beginning, have it be a very open and transparent process.

8 COMMISSIONER OSTENDORFF: Thank you. I know as the
9 Chairman indicated in his comments earlier, there's much we don't know.
10 There'll be significant periods of time before we have full granularity, a lot of the
11 details of what happened at Fukushima, but there's one area, if you'll just bear
12 with me, that I do want to ask you about. I've been here not quite one year; I've
13 spent very little time looking at spent fuel pools. When I go visit a plant, I'll go
14 see the pool, and on some of these visits -- I've probably seen four, I think, in the
15 last year. But I certainly don't have much background at all in the spent fuel
16 pools. And recognizing that's been the focus of a lot of the concerns over the
17 last 10 days, and that perhaps compared to our discussions, we have an
18 emergency core cooling systems and GSI-191 and other issues that we don't
19 spend a lot of time, as a Commission, really talking about that.

20 Is there any initial area of U.S. reactor plant spent-fuel configuration
21 or operation that comes to your mind as warranting particular exploration in this
22 task force?

23 MR. BORCHARDT: Well clearly, it's a very simple problem. All
24 you have to do is keep water in the pool. The pool is an open vessel, and the
25 only objective is to keep water in it. Even if, in a bad situation, it were to heat up

1 and you had boiling in there, as long as you kept the fuel covered with water,
2 you're going to prevent the high radiological release. So I think what the task
3 force needs to do is to go down the specifics of what happened in Japan, and
4 then evaluate that to make sure that in fact, these things that we put into place
5 after 9/11, for example, really would work under that scenario.

6 We have thought about things like making sure that the equipment
7 you're going to use wouldn't be damaged in the event that caused the first
8 problem, so you can't have everything staged exactly where it's ready to be
9 used. There has to be some staging areas. But for example, on the tsunami or a
10 flooding issue you wouldn't want the equipment now stored outside, right?
11 Because it would be swept away. So you know, it's yet another "what if" to really
12 help us explore and probe what the various scenarios are being, and make sure
13 we have the highest probability of success. I think that's really the box we need
14 people to be thinking in.

15 COMMISSIONER OSTENDORFF: That's very helpful. Thank you.
16 Thank you, Mr. Chairman.

17 CHAIRMAN JACZKO: I'd ask at this point if there are any other
18 questions that any of my colleagues have.

19 MR. BORCHARDT: Well at this point, can I just --

20 CHAIRMAN JACZKO: Sure, Bill.

21 MR. BORCHARDT: Can I just -- I'm not going to ask you a
22 question.

23 [laughter]

24 CHAIRMAN JACZKO: I'm not sure I'd have answered it for you if
25 you did.

1 [laughter]

2 MR. BORCHARDT: I do want to just take a moment and thank all
3 the NRC staff that have responded to this event, all the people that are in the
4 Ops Center -- we're doing our best to have a rotation of people in and out of
5 there, but they're working very hard, very long hours. They're still doing their real
6 job too, like I said, that's got to be our first priority. But I want to just make
7 special note of the team of people that volunteered to go to Japan on no notice,
8 that have been there working incredibly long, hard hours, working in a way that
9 there is no operating procedure to operate. They have had to develop it on the
10 go. So Chuck Casto happens to be the team leader, but there are many people
11 that have worked very hard. We have sent another person over to help Chuck in
12 that team-leader role, and there is the next wave of NRC employees that have
13 volunteered, and they'll be leaving beginning, I think it's tomorrow. And then the
14 last element of that group on Thursday. So I just want to make special note of
15 their commitment and professionalism. Thank you.

16 CHAIRMAN JACZKO: Well thanks for that, Bill. I appreciate that,
17 and your work as well, I think, as I've noted. At this point I would just offer that
18 we do have a proposal that's been circulated that I think captures at a high level
19 some of these ideas for a path forward, and I would certainly encourage that we
20 move on that as promptly as possible. But I thought I'd offer at this time an
21 opportunity, if anybody wants to make comments on that or any of the other
22 issues that we have in front of us. Commissioner Ostendorff?

23 COMMISSIONER OSTENDORFF: I just thank you for convening
24 this meeting today. I think it's been very helpful, and I know that we're all ready
25 to move forward to take the actions we need to take.

1 CHAIRMAN JACZKO: Okay. Well again I want to thank everybody
2 for their efforts so far, and again, I just want to reiterate as we close that as many
3 people on this side of the table have indicated, we have had, many of us, very
4 close and personal relationships with colleagues in Japan, and our hearts go out
5 to them as they continue to deal with this very difficult event, and we will continue
6 to work to provide our colleagues and counterparts in Japan with assistance as
7 they need it, to deal with the situation. And I think as Commissioner Magwood
8 indicated, this is likely the first of many discussions we will have on this topic, and
9 I look forward to continuing the discussion and continuing our focus on our
10 important health and safety mission. With that, we are adjourned. Thank you.

11 [Whereupon the proceedings were concluded]

From: LIA02 Hoc
Sent: Wednesday, March 23, 2011 7:10 AM
To: LIA03 Hoc
Attachments: Letter - Summary of reactor unit status at 0500 23-March UTC[1].pdf; list of offers put on enac 20110322.pdf

RFR/268

	YES (unmaned aerial vehicle)	YES (robot in high d rate area)
		YES (isotope, activity

From: [Burnell, Scott](#)
To: [Akstulewicz, Brenda](#)
Cc: [Harrington, Holly](#)
Subject: Sesmic FAQ update
Date: Tuesday, March 22, 2011 10:35:45 AM
Attachments: [11-053 attchmt 3 21.docx](#)

Brenda;

Please have Webworks replace the existing seismic FAQs with this document. Thanks.

Scott

RRRR-289



NRC frequently asked questions related to the March 11, 2011 Japanese Earthquake and Tsunami

List of Questions

1)	Can an earthquake and tsunami as large as happened in Japan also happen here?	1
2)	Did the Japanese underestimate the size of the maximum credible earthquake and tsunami that could affect the plants?.....	1
3)	How high was the tsunami at the Fukushima nuclear plants?	1
4)	Was the damage to the Japanese nuclear plants mostly from the earthquake or the tsunami?	1
5)	Have any lessons for US nuclear plants been identified?	1
6)	Was there any damage to US reactors from either the earthquake or the resulting tsunami? 2	
7)	How many US reactors are located in active earthquake zones?	2
8)	What level of earthquake hazard are the US reactors designed for?	2
9)	What magnitude earthquake are currently operating US nuclear plants designed to?	2
10)	Have events in Japan changed our perception of earthquake risk to the nuclear plants in the US?	2
11)	Can significant damage to a nuclear plant like we see in Japan happen in the US due to an earthquake? Are the Japanese nuclear plants similar to US nuclear plants?	3
12)	What is the likelihood of the design basis or “SSE” ground motions being exceeded over the life of a nuclear plant?	3
13)	Which reactors are along coastal areas that could be affected by a tsunami?	3
14)	What is magnitude anyway? What is the Richter Scale? What is intensity?.....	4
15)	How do magnitude and ground motion relate to each other?	4
16)	What is Generic Issue 199 about?	4
17)	Does GI-199 provide rankings of US nuclear plants in terms of safety?.....	4
18)	What are the current findings of GI-199?	5
19)	What do you mean by “increased estimates of seismic hazards” at nuclear plant sites?	5
20)	Does the Seismic Core Damage represent a measurement of the risk of radiation release or only the risk of core damage (not accounting for additional containment)?	5
21)	Where can I get current information about Generic Issue 199?	5
22)	Could an accident sequence like the one at Japan’s Fukushima Daiichi nuclear plants happen in the US?.....	6

1) Can an earthquake and tsunami as large as happened in Japan also happen here?

This earthquake occurred on a “subduction zone”, which is the type of tectonic region that produces earthquakes of the largest magnitude. A subduction zone is a tectonic plate boundary where one tectonic plate is pushed under another plate. Subduction zone earthquakes are also required to produce the kind of massive tsunami seen in Japan. In the continental US, the only subduction zone is the Cascadia subduction zone which lies off the coast of northern California, Oregon and Washington. So, a continental earthquake and tsunami as large as in Japan could only happen there. The only nuclear plant near the Cascadia subduction zone is the Columbia Generating Station. This plant is located a large distance from the coast (approximately 225 miles) and the subduction zone (approximately 300 miles), so the ground motions estimated at the plant are far lower than those seen at the Fukushima plants. This distance also precludes the possibility of a tsunami affecting the plant. Outside of the Cascadia subduction zone, earthquakes are not expected to exceed a magnitude of approximately 8. Magnitude is measured on a log scale and so a magnitude 9 earthquake is approximately 32 times larger than a magnitude 8 earthquake.

2) Did the Japanese underestimate the size of the maximum credible earthquake and tsunami that could affect the plants?

The magnitude of the earthquake was somewhat greater than was expected for that part of the subduction zone. However, the Japanese nuclear plants were recently reassessed using ground motion levels similar to those that are believed to have occurred at the sites. The ground motions against which the Japanese nuclear plants were reviewed were expected to result from earthquakes that were smaller, but were much closer to the sites. The NRC does not currently have information on the maximum tsunami height that was expected at the sites.

3) How high was the tsunami at the Fukushima nuclear plants?

The tsunami modeling team at the National Oceanic and Atmospheric Administration’s Pacific Marine Environmental Lab have estimated the wave height just offshore to be approximately 8 meters in height at Fukushima Daiichi and approximately 7 meters in Fukushima Daini. This is based on recordings from NOAA’s Deep-ocean Assessment and Reporting of Tsunamis (DART) buoys and a high resolution numerical model developed for the tsunami warning system. If plant recordings exist they were not yet provided to the NRC.

4) Was the damage to the Japanese nuclear plants mostly from the earthquake or the tsunami?

Because this event happened in Japan, it is hard for NRC staff to make the assessment necessary to understand exactly what happened at this time. In the nuclear plants there may have been some damage from the shaking, and the earthquake caused the loss of offsite power. However, the tsunami appears to have played a key role in the loss of other power sources at the site producing station blackout, which is a critical factor in the ongoing problems.

5) Have any lessons for US nuclear plants been identified?

The NRC is in the process of following and reviewing the event in real time. This will undoubtedly lead to the identification of issues that warrant further study. However, a complete

understanding of lessons learned will require more information than is currently available to NRC staff.

6) Was there any damage to US reactors from either the earthquake or the resulting tsunami?

No.

7) How many US reactors are located in active earthquake zones?

Although we often think of the US as having “active” and “non-active” earthquake zones, earthquakes can actually happen almost anywhere. Seismologists typically separate the US into low, moderate, and high seismicity zones. The NRC requires that every nuclear plant be designed for site-specific ground motions that are appropriate for their locations. In addition, the NRC has specified a minimum ground motion level to which nuclear plants must be designed.

8) What level of earthquake hazard are the US reactors designed for?

Each reactor is designed for a different ground motion that is determined on a site-specific basis. The existing nuclear plants were designed on a “deterministic” or “scenario earthquake” basis that accounted for the largest earthquakes expected in the area around the plant, without consideration of the likelihood of the earthquakes considered. New reactors are designed using probabilistic techniques that characterize both the ground motion levels and uncertainty at the proposed site. These probabilistic techniques account for the ground motions that may result from all potential seismic sources in the region around the site. Technically speaking, this is the ground motion with an annual frequency of occurrence of 1×10^{-4} /year, but this can be thought of as the ground motion that occurs every 10,000 years on average. One important aspect is that probabilistic hazard and risk-assessment techniques account for beyond-design basis events. NRC’s Generic Issue 199 (GI-199) project is using the latest probabilistic techniques used for new nuclear plants to review the safety of the existing plants. [see questions 16 to 21 for more information about GI-199]

9) What magnitude earthquake are currently operating US nuclear plants designed to?

Ground motion is a function of both the magnitude of an earthquake and the distance from the fault to the site. Nuclear plants, and in fact all engineered structures, are actually designed based on ground motion levels, not earthquake magnitudes. The existing nuclear plants were designed based on a “deterministic” or “scenario earthquake” basis that accounted for the largest earthquakes expected in the area around the plant. A margin is further added to the predicted ground motions to provide added robustness.

10) Have events in Japan changed our perception of earthquake risk to the nuclear plants in the US?

The NRC continues to determine that US nuclear plants are safe. This does not change the NRC’s perception of earthquake hazard (i.e., ground motion levels) at US nuclear plants. It is too early to tell what the lessons from this earthquake are. The NRC will look closely at all aspects of response of the plants to the earthquake and tsunami to determine if any actions need to be taken in US nuclear plants and if any changes are necessary to NRC regulations.

11) Can significant damage to a nuclear plant like we see in Japan happen in the US due to an earthquake? Are the Japanese nuclear plants similar to US nuclear plants?

All US nuclear plants are built to withstand environmental hazards, including earthquakes and tsunamis. Even those nuclear plants that are located within areas with low and moderate seismic activity are designed for safety in the event of such a natural disaster. The NRC requires that safety-significant structures, systems, and components be designed to take into account even rare and extreme seismic and tsunami events. In addition to the design of the plants, significant effort goes into emergency response planning and accident management. This approach is called defense-in-depth.

The Japanese facilities are similar in design to some US facilities. However, the NRC has required modifications to the plants since they were built, including design changes to control hydrogen and pressure in the containment. The NRC has also required plants to have additional equipment and measures to mitigate damage stemming from large fires and explosions from a beyond-design-basis event. The measures include providing core and spent fuel pool cooling and an additional means to power other equipment on site.

12) What is the likelihood of the design basis or “SSE” ground motions being exceeded over the life of a nuclear plant?

The ground motions that are used as seismic design bases at US nuclear plants are called the Safe Shutdown Earthquake ground motion (SSE). In the mid to late 1990s, the NRC staff reviewed the potential for ground motions beyond the design basis as part of the Individual Plant Examination of External Events (IPEEE). From this review, the staff determined that seismic designs of operating nuclear plants in the US have adequate safety margins for withstanding earthquakes. Currently, the NRC is in the process of conducting GI-199 to again assess the resistance of US nuclear plants to earthquakes. Based on NRC’s preliminary analyses to date, the mean probability of ground motions exceeding the SSE over the life of the plant for the plants in the Central and Eastern United States is less than about 1%.

It is important to remember that structures, systems and components are required to have “adequate margin,” meaning that they must continue be able withstand shaking levels that are above the plant’s design basis.

13) Which reactors are along coastal areas that could be affected by a tsunami?

Many nuclear plants are located in coastal areas that could potentially be affected by a tsunami. Two nuclear plants, Diablo Canyon and San Onofre, are on the Pacific Coast, which is known to have a tsunami hazard. Two nuclear plants on the Gulf Coast, South Texas and Crystal River, could also be affected by tsunami. There are many nuclear plants on the Atlantic Coast or on rivers that may be affected by a tidal bore resulting from a tsunami. These include St. Lucie, Turkey Point, Brunswick, Oyster Creek, Millstone, Pilgrim, Seabrook, Calvert Cliffs, Salem/Hope Creek, and Surry. Tsunami on the Gulf and Atlantic Coasts occur, but are very rare. Generally the flooding anticipated from hurricane storm surge exceeds the flooding expected from a tsunami for nuclear plants on the Atlantic and Gulf Coast. Regardless, all nuclear plants are designed to withstand a tsunami.

14) What is magnitude anyway? What is the Richter Scale? What is intensity?

An earthquake's magnitude is a measure of the strength of the earthquake as determined from seismographic observations. Magnitude is essentially an objective, quantitative measure of the size of an earthquake. The magnitude can be expressed in various ways based on seismographic records (e.g., Richter Local Magnitude, Surface Wave Magnitude, Body Wave Magnitude, and Moment Magnitude). Currently, the most commonly used magnitude measurement is the Moment Magnitude, M_w , which is based on the strength of the rock that ruptured, the area of the fault that ruptured, and the average amount of slip. Moment magnitude is, therefore, a direct measure of the energy released during an earthquake. Because of the logarithmic basis of the scale, each whole number increase in magnitude

represents a tenfold increase in measured amplitude; as an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

The Richter magnitude scale was developed in 1935 by Charles F. Richter of the California Institute of Technology and was based on the behavior of a specific seismograph that was manufactured at that time. The instruments are no longer in use and the magnitude scale is, therefore, no longer used in the technical community. However, the Richter Scale is a term that is so commonly used by the public that scientists generally just answer questions about "Richter" magnitude by substituting moment magnitude without correcting the misunderstanding.

The intensity of an earthquake is a qualitative assessment of effects of the earthquake at a particular location. The intensity assigned is based on observed effects on humans, on human-built structures, and on the earth's surface at a particular location. The most commonly used scale in the US is the Modified Mercalli Intensity (MMI) scale, which has values ranging from I to XII in the order of severity. MMI of I indicates an earthquake that was not felt except by a very few, whereas MMI of XII indicates total damage of all works of construction, either partially or completely. While an earthquake has only one magnitude, intensity depends on the effects at each particular location.

15) How do magnitude and ground motion relate to each other?

The ground motion experienced at a particular location is a function of the magnitude of the earthquake, the distance from the fault to the location of interest, and other elements such as the geologic materials through which the waves pass.

16) What is Generic Issue 199 about?

GI-199 investigates the safety and risk implications of updated earthquake-related data and models. These data and models suggest that the probability for earthquake ground motion above the seismic design basis for some nuclear plants in the Central and Eastern United States, although is still low, is larger than previous estimates.

17) Does GI-199 provide rankings of US nuclear plants in terms of safety?

The NRC does not rank nuclear plants by seismic risk. The objective of the GI-199 Safety/Risk Assessment was to perform a conservative, screening-level assessment to evaluate if further investigations of seismic safety for operating reactors in the central and eastern US (CEUS) are warranted, consistent with NRC directives. The results of the GI-199 safety risk assessment

should not be interpreted as definitive estimates of plant-specific seismic risk because some analyses were very conservative making the calculated risk higher than in reality. The nature of the information used (both seismic hazard data and plant-level fragility information) make these estimates useful only as a screening tool.

18) What are the current findings of GI-199?

Currently operating nuclear plants in the US remain safe, with no need for immediate action. This determination is based on NRC staff reviews of updated seismic hazard information and the conclusions of the first stage of GI-199. Existing nuclear plants were designed with considerable margin to be able to withstand the ground motions from the “deterministic” or “scenario earthquake” that accounted for the largest earthquakes expected in the area around the plant. The results of the GI-199 assessment demonstrate that the probability of exceeding the design basis ground motion may have increased at some sites, but only by a relatively small amount. In addition, the probabilities of seismic core damage are lower than the guidelines for taking immediate action. Although there is not an immediate safety concern, the NRC is focused on assuring safety during even very rare and extreme events. Therefore, the NRC has determined that assessment of updated seismic hazards and plant performance should continue.

19) What do you mean by “increased estimates of seismic hazards” at nuclear plant sites?

Seismic hazard (earthquake hazard) represents the chance (or probability) that a specific level of ground motion could be observed or exceeded at a given location. Our estimates of seismic hazard at some Central and Eastern United States locations have changed based on results from recent research, indicating that earthquakes occurred more often in some locations than previously estimated. Our estimates of seismic hazard have also changed because the models used to predict the level of ground motion, as caused by a specific magnitude earthquake at a certain distance from a site, changed. The increased estimates of seismic hazard at some locations in the Central and Eastern United States were discussed in a memorandum to the Commission, dated July 26, 2006. (The memorandum is available in the NRC Agencywide Documents Access and Management System [ADAMS] under Accession No. ML052360044).

20) Does the Seismic Core Damage represent a measurement of the risk of radiation release or only the risk of core damage (not accounting for additional containment)?

Seismic core damage frequency is the probability of damage to the core resulting from a seismic initiating event. It does not imply either a meltdown or the loss of containment, which would be required for radiological release to occur. The likelihood of radiation release is far lower.

21) Where can I get current information about Generic Issue 199?

The public NRC Generic Issues Program (GIP) website (<http://www.nrc.gov/about-nrc/regulatory/gen-issues.html>) contains program information and documents, background and historical information, generic issue status information, and links to related programs. The latest Generic Issue Management Control System quarterly report, which has regularly updated GI-199 information, is publicly available at <http://www.nrc.gov/reading-rm/doc-collections/generic-issues/quarterly/index.html>. Additionally, the US Geological Survey provides data and results that are publicly available at <http://earthquake.usgs.gov/hazards/products/conterminous/2008/>.

22) Could an accident sequence like the one at Japan's Fukushima Daiichi nuclear plants happen in the US?

It is difficult to answer this question until we have a better understanding of the precise problems and conditions that faced the operators at Fukushima Daiichi. We do know, however, that Fukushima Daiichi Units 1-3 lost all offsite power and emergency diesel generators. This situation is called "station blackout." US nuclear power plants are designed to cope with a station blackout event that involves a loss of offsite power and onsite emergency power. The Nuclear Regulatory Commission's detailed regulations address this scenario. US nuclear plants are required to conduct a "coping" assessment and develop a strategy to demonstrate to the NRC that they could maintain the plant in a safe condition during a station blackout scenario. These assessments, proposed modifications to the plant, and operating procedures were reviewed and approved by the NRC. Several plants added additional AC power sources to comply with this regulation.

In addition, US nuclear plant designs and operating practices since the terrorist events of September 11, 2001, are designed to mitigate severe accident scenarios such as aircraft impact, which include the complete loss of offsite power and all on-site emergency power sources.

US nuclear plant designs include consideration of seismic events and tsunamis'. It is important not to extrapolate earthquake and tsunami data from one location of the world to another when evaluating these natural hazards. These catastrophic natural events are very region- and location-specific, based on tectonic and geological fault line locations.

From: LIA02 Hoc
Sent: Tuesday, March 29, 2011 11:00 AM
To: Schwartzman, Jennifer; LIA03 Hoc
Cc: 'ShafferMR@state.gov'
Subject: Next week's IAEA meetings

Hi Jen,

The LT Director was asked by ET director Mike Webber to get more information about an all member states meeting that DG Ammano called for Monday night. He is looking to get information on what this meeting will cover, agenda if possible. He wants a better feel for what the DG will be talking about and/or asking for from member states. Can you work with Mark in Vienna to get something together for us to give to ET Mike Webber?

Thanks,

LIA02 (Jill)

RRRR/070

From:

OST02 HOC

To:

Abrams, Charlotte; Abu-Eid, Bobby; Adams, John; Afshar-Tous, Mugeh; Ahn, Hosung; Alemu, Bezakulu; Alter, Peter; Anderson, Brian; Anderson, James; Arribas-Colon, Maria; Ashkebousi, Nima; Athey, George; Baker, Stephen; Ballam, Nick; Barnhurst, Daniel; Barr, Cynthia; Barss, Dan; Bazian, Samuel; Bensj, Michelle; Bergman, Thomas; Berry, Rollie; Bhachu, Ujagar; Bloom, Steven; Blount, Tom; Boger, Bruce; Bonnette, Cassandra; Borchardt, Bill; Bowers, Anthony; Bowman, Gregory; Boyce, Tom (RES); Brandon, Lou; Brandt, Philip; Brenner, Eliot; Brock, Kathryn; Brown, Cris; Brown, David; Brown, Eva; Brown, Frederick; Brown, Michael; Bukharin, Oleg; Burnell, Scott; Bush-Goddard, Stephanie; Campbell, Stephen; Camper, Larry; Carpenter, Cynthia; Carter, Mary; Case, Michael; Casto, Greg; Cecere, Bethany; Cervera, Margaret; Chazell, Russell; Chen, Yen-Ju; Cheok, Michael; Chokshi, Nilesh; Chowdhury, Prosanta; Circle, Jeff; Clement, Richard; Clinton, Rebecca; Coggins, Angela; Collins, Frank; Cool, Donald; Correia, Richard; Costa, Arlon; Couret, Ivonne; Crutchley, Mary Glenn; Cruz, Zahira; Cuadrado, Leira; Dacus, Eugene; DeCicco, Joseph; Decker, David; Dembek, Stephen; Devlin, Stephanie; Dimmick, Lisa; Doane, Margaret; Dorman, Dan; Dorsey, Cynthia; Dozier, Jerry; Drake, Margaret; Droggitis, Spiros; Dube, Donald; Dudes, Laura; Eads, Johnny; Emche, Danielle; English, Lance; Erlanger, Craig; Esmaili, Hossein; Figueroa, Roberto; Fiske, Jonathan; Flannery, Cindy; Floyd, Daphene; Foggie, Kirk; Foster, Jack; Fragoyannis, Nancy; Franovich, Rani; Frazier, Alan; Freshman, Steve; Fuller, Edward; Galletta, Thomas; Gambone, Kimberly; Gibson, Kathy; Gitter, Joseph; Gilmer, James; Gordon, Dennis; Gott, William; Grant, Jeffery; Greenwood, Carol; Grimes, Kelly; Grobe, Jack; Gross, Allen; Gulla, Gerald; Hale, Jerry; Hardesty, Duane; Harrington, Holly; Harris, Tim; Hart, Ken; Hart, Michelle; Harvey, Brad; Hasselberg, Rick; Hayden, Elizabeth; Helton, Donald; Henderson, Karen; Hiland, Patrick; Holahan, Patricia; Holahan, Vincent; Holian, Brian; Howard, Tabitha; Huffert, Anthony; Hurd, Sapna; Huyck, Doug; Imboden, Andy; Isom, James; Jackson, Karen; Jacobson, Jeffrey; Jerve, Richard; Jessie, Janelle; Johnson, Michael; Jolicoeur, John; Jones, Andrea; Jones, Cynthia; Jones, Henry; Kahler, Carolyn; Kammerer, Annie; Karas, Rebecca; Kauffman, John; Khan, Omar; Kolb, Timothy; Kotzalas, Margie; Kowalczyk, Jeffrey; Kratchman, Jessica; Kugler, Andrew; Lamb, Christopher; Lane, John; Larson, Emily; Laur, Steven; LaVie, Steve; Lewis, Robert; Li, Yong; Lichatz, Taylor; Lising, Jason; Lombard, Mark; Lubinski, John; Lui, Christiana; Lukes, Kim; Lynch, Jeffery; Ma, John; Mamish, Nader; Manahan, Michelle; Marksberry, Don; Marshall, Jane; Masao, Nagai; Maupin, Cardelia; Mayros, Lauren; Mazaika, Michael; McConnell, Keith; McCoppin, Michael; McDermott, Brian; McGinty, Tim; McGovern, Denise; McIntyre, David; McMurtray, Anthony; Merritt, Christina; Meyer, Karen; Miller, Charles; Miller, Chris; Milligan, Patricia; Miranda, Samuel; Mohseni, Aby; Moore, Scott; Morlang, Gary; Morris, Scott; Mroz (Sahm), Sara; Munson, Clifford; Murray, Charles; Nerret, Amanda; Nguven, Caroline; Norris, Michael; Norton, Charles; Ordaz, Vonna; Owens, Janice; Padovan, Mark; Parillo, John; Patel, Jay; Patel, Pravin; Patrick, Mark; Perin, Vanice; Pope, Tia; Powell, Amy; Purdy, Gary; Quinlan, Kevin; Raddatz, Michael; Ragland, Robert; Ralph, Melissa; Ramsey, Jack; Reed, Elizabeth; Reed, Sara; Reed, Wendy; Reis, Terrence; Resner, Mark; Riley (OCA), Timothy; Riner, Kelly; Rini, Brett; Robinson, Edward; Rodriguez-Luccioni, Hector; Roggenbrodt, William; Ropon, Kimberly; Rosenberg, Stacey; Ross-Lee, MaryJane; Roundtree, Amy; Ruland, William; Ryan, Michelle; Salay, Michael; Salter, Susan; Salus, Amy; Sanfilippo, Nathan; Scarbrough, Thomas; Schaperow, Jason; Schmidt, Duane; Schmidt, Rebecca; Schoenebeck, Greg; Schrader, Eric; Schwartzman, Jennifer; Seber, Dogan; See, Kenneth; Shane, Raeann; Shea, James; Shepherd, Jill; Sheron, Brian; Skarda, Raymond; Skeen, David; Sloan, Scott; Smiroldo, Elizabeth; Smith, Brooke; Smith, Stacy; Smith, Theodore; Stahl, Eric; Stang, Annette; Steger (Tucci), Christine; Stieve, Alice; Stone, Rebecca; Stransky, Robert; Sturz, Fritz; Sullivan, Randy; Summers, Robert; Sun, Casper; Tappert, John; Tegeler, Bret; Temple, Jeffrey; Thaggard, Mark; Thomas, Eric; Thorp, John; Tiruneh, Nebiyu; Tobin, Jennifer; Trefethen, Jean; Tschiltz, Michael; Turtill, Richard; Uhle, Jennifer; Valencia, Sandra; Vaughn, James; Versluis, Robert; Vick, Lawrence; Virgilio, Martin; Virgilio, Rosetta; Ward, Leonard; Ward, William; Wastler, Sandra; Watson, Bruce; Webber, Robert; Weber, Michael; White, Bernard; Wiggins, Jim; Williams, Donna; Williams, Joseph; Williamson, Linda; Willis, Dori; Wimbush, Andrea; Wittick, Brian; Wray, John; Wright, Lisa (Gibney); Wright, Ned; Wunder, George; Young, Francis; Zimmerman, Jacob; Zimmerman, Roy

Date:

Tuesday, March 22, 2011 12:52:41 PM

Attachments:

MASTER RESPONDER SCHEDULE FOR MAR 19-25-11- JAPAN EARTHQUAKE (2).pdf

Please disregard the last copy which was the template.

Revised Copy

Attached is the OPS Center watchbill for March 18-26th, you will be receiving the watchbill for the week of March 26-April 2nd, in the future. If you need to change the schedule, please send an email to OST02 HOC.

RRRR-271

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE
MARCH 18-26

Position	Date	Time	Staff
Executive Team			
ET Director			
Fri-Sat	3/18-3/19	11pm-7am	Roy Zimmerman
Sat	19-Mar	7am - 3pm	Jim Wiggins
Sat	19-Mar	3pm-11pm	Brian Sheron
Sat-Sun	3/19-3/20	11pm - 7am	Mike Johnson
Sun	20-Mar	7am - 3pm	Jim Wiggins
Sun	20-Mar	3pm-11pm	Brian Sheron
Sun-Mon	3/20-3/21	11pm - 7am	Mike Johnson
Mon	21-Mar	7am - 3pm	Mike Weber
Mon	21-Mar	3pm-11pm	Jim Wiggins
Mon-Tues	3/21-3/22	11pm - 7am	Mike Johnson
Tues	22-Mar	7am - 3pm	Mike Weber
Tues	22-Mar	3pm-11pm	Jim Wiggins
Tues-Wed	3/22-3/23	11pm - 7am	Bruce Boger
Wed	23-Mar	7am - 3pm	Mike Weber
Wed	23-Mar	3pm-11pm	Roy Zimmerman
Wed-Thur	3/23-3/24	11pm - 7am	Bruce Boger
Thur	24-Mar	7am - 3pm	Mike Weber
Thur	24-Mar	3pm-11pm	Roy Zimmerman
Thur-Fri	3/24-3/25	11pm - 7am	Jennifer Uhle
Fri	25-Mar	7am - 3pm	Mike Weber
Fri	25-Mar	3pm-11pm	Roy Zimmerman
Fri-Sat	3/25-3/26	11pm-7am	Jennifer Uhle
ET Response Advisor			
Fri-Sat	3/18-3/19	11pm-7am	Scott Morris
Sat	19-Mar	7am - 3pm	Brian McDermott
Sat	19-Mar	3pm-11pm	Mary Jane (MJ) Ross-Lee
Sat-Sun	3/19-3/20	11pm - 7am	Scott Morris
Sun	20-Mar	7am - 3pm	Chris Miller
Sun	20-Mar	3pm-11pm	Mary Jane (MJ) Ross-Lee
Sun-Mon	3/20-3/21	11pm - 7am	Scott Morris
Mon	21-Mar	7am - 3pm	Brian McDermott
Mon	21-Mar	3pm-11pm	Chris Miller
Mon-Tues	3/21-3/22	11pm - 7am	Scott Morris
Tues	22-Mar	7am - 3pm	Mary Jane (MJ) Ross-Lee
Tues	22-Mar	3pm-11pm	Chris Miller
Tues-Wed	3/22-3/23	11pm - 7am	Tim McGinty
Wed	23-Mar	7am - 3pm	Brian McDermott
Wed	23-Mar	3pm-11pm	Joe Giitter
Wed-Thur	3/23-3/24	11pm - 7am	Tim McGinty
Thur	24-Mar	7am - 3pm	Mary Jane (MJ) Ross-Lee
Thur	24-Mar	3pm-11pm	Joe Giitter
Thur-Fri	3/24-3/25	11pm - 7am	Tim McGinty
Fri	25-Mar	7am - 3pm	Mary Jane (MJ) Ross-Lee
Fri	25-Mar	3pm-11pm	Joe Giitter
Fri-Sat	3/25-3/26	11pm-7am	Tim McGinty
ET Rx Prot Measures & State Coordinator			

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE
MARCH 18-26

Fri-Sat	3/18-3/19	11pm-7am	Scott Moore
Sat	19-Mar	7am - 3pm	Larry Camper
Sat	19-Mar	3pm-11pm	Patricia Holahan
Sat-Sun	3/19-3/20	11pm - 7am	Rob Lewis
Sun	20-Mar	7am - 3pm	Vonna Ordaz
Sun	20-Mar	3pm-11pm	Larry Camper
Sun-Mon	3/20-3/21	11pm - 7am	Cynthia Carpenter
Mon	21-Mar	7am - 3pm	Charlie Miller
Mon	21-Mar	3pm-11pm	Larry Camper
Mon-Tues	3/21-3/22	11pm - 7am	Rob Lewis
Tues	22-Mar	7am - 3pm	Charlie Miller
Tues	22-Mar	3pm-11pm	Patricia Holahan
Tues-Wed	3/22-3/23	11pm - 7am	Cynthia Carpenter
Wed	23-Mar	7am - 3pm	Charlie Miller
Wed	23-Mar	3pm-11pm	Patricia Holahan
Wed-Thur	3/23-3/24	11pm - 7am	Cynthia Carpenter
Thur	24-Mar	7am - 3pm	Charlie Miller
Thur	24-Mar	3pm-11pm	Larry Camper
Thur-Fri	3/24-3/25	11pm - 7am	Cynthia Carpenter
Fri	25-Mar	7am - 3pm	Charlie Miller
Fri	25-Mar	3pm-11pm	Patricia Holahan
Fri-Sat	3/25-3/26	11pm-7am	Cynthia Carpenter
Executive Briefing Team			
EBT Admin. Assistant			
Fri-Sat	3/18-3/19	11pm-7am	Sapna Hurd
Sat	19-Mar	7am - 3pm	Carolyn Kahler
Sat	19-Mar	3pm-11pm	Annette Stang
Sat-Sun	3/19-3/20	11pm - 9am	Sapna Hurd
Sun	20-Mar	9am - 7pm	Annette Stang
Sun-Mon	3/20-3/21	7pm-7am	Carolyn Kahler
Mon	21-Mar	7am - 3pm	A. Stang (7-11) / Sapna Hurd (11-3)
Mon	21-Mar	3pm-11pm	Tia Pope
Mon-Tues	3/21-3/22	11pm - 7am	Christina Merritt
Tues	22-Mar	7am - 3pm	Carolyn Kahler/Sapna Hurd
Tues	22-Mar	3pm-11pm	Jon Fiske
Tues-Wed	3/22-3/23	11pm - 7am	Tia Pope
Wed	23-Mar	7am - 3pm	Jon Fiske
Wed	23-Mar	3pm-11pm	Annette Stang
Wed-Thur	3/23-3/24	11pm - 7am	Christina Merritt
Thur	24-Mar	7am - 3pm	Carolyn Kahler/Sapna Hurd
Thur	24-Mar	3pm-11pm	Andrea Wimbush
Thur-Fri	3/24-3/25	11pm - 7am	Tia Pope
Fri	25-Mar	7am - 3pm	Jon Fiske
Fri	25-Mar	3pm-11pm	Sapna Hurd
Fri-Sat	3/25-3/26	11pm-7am	Carolyn Kahler
EBT Coordinator			
Fri-Sat	3/18-3/19	11pm-7am	Christine Steger
Sat	19-Mar	7am - 3pm	Caroline Nguyen
Sat	19-Mar	3pm-11pm	Sara Mroz

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE
MARCH 18-26

Sat-Sun	3/19-3/20	11pm - 7am	Jim Andersen
Sun	20-Mar	7am - 3pm	Yen-Ju Chen
Sun	20-Mar	3pm-11pm	Caroline Nguyen
Sun-Mon	3/20-3/21	11pm - 7am	Jim Andersen
Mon	21-Mar	7am - 3pm	Yen-Ju Chen
Mon	21-Mar	3pm-11pm	Sara Mroz
Mon-Tues	3/21-3/22	11pm - 7am	Jim Andersen
Tues	22-Mar	7am - 3pm	Caroline Nguyen
Tues	22-Mar	3pm-11pm	Sara Mroz
Tues-Wed	3/22-3/23	11pm - 7am	Jim Andersen
Wed	23-Mar	7am - 3pm	Yen-Ju Chen
Wed	23-Mar	3pm-11pm	Sara Mroz
Wed-Thur	3/23-3/24	11pm - 7am	Jim Andersen
Thur	24-Mar	7am - 3pm	Yen-Ju Chen
Thur	24-Mar	3pm-11pm	Sara Mroz
Thur-Fri	3/24-3/25	11pm - 7am	Jim Andersen
Fri	25-Mar	7am - 3pm	Yen-Ju Chen
Fri	25-Mar	3pm-11pm	Sara Mroz
Fri-Sat	3/25-3/26	11pm-7am	Jim Andersen

Executive Support Team

EST Status Officer			
Fri-Sat	3/18-3/19	11pm-7am	Doug Huyck
Sat	19-Mar	7am - 3pm	Craig Erlanger
Sat	19-Mar	3pm-11pm	John Jolicoeur
Sat-Sun	3/19-3/20	11pm - 7am	Doug Huyck
Sun	20-Mar	7am - 3pm	Craig Erlanger
Sun	20-Mar	3pm-11pm	John Jolicoeur
Sun-Mon	3/20-3/21	11pm - 7am	Doug Huyck
Mon	21-Mar	7am - 3pm	Jane Marshall
Mon	21-Mar	3pm-11pm	Bill Gott
Mon-Tues	3/21-3/22	11pm - 7am	Jeff Grant
Tues	22-Mar	7am - 3pm	John Jolicoeur
Tues	22-Mar	3pm-11pm	Bill Gott
Tues-Wed	3/22-3/23	11pm - 7am	Jeff Grant
Wed	23-Mar	7am - 3pm	Sally Billings/Jane Marshall
Wed	23-Mar	3pm-11pm	Bill Gott
Wed-Thur	3/23-3/24	11pm - 7am	Jeff Grant
Thur	24-Mar	7am - 3pm	Jane Marshall
Thur	24-Mar	3pm-11pm	Bill Gott
Thur-Fri	3/24-3/25	11pm - 7am	Jeff Grant
Fri	25-Mar	7am - 3pm	Jane Marshall
Fri	25-Mar	3pm-11pm	Bill Gott
Fri-Sat	3/25-3/26	11pm-7am	Jeff Grant
EST Actions Officer			
Fri-Sat	3/18-3/19	11pm-7am	Amy Roundtree
Sat	19-Mar	7am - 3pm	Bezakulu Alemu
Sat	19-Mar	3pm-11pm	Melissa Ralph
Sat-Sun	3/19-3/20	11pm - 7am	Jonathan Fiske
Sun	20-Mar	7am - 3pm	Melissa Ralph

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE

MARCH 18-26

Sun	20-Mar	3pm-11pm	Jonathan Fiske
Sun-Mon	3/20-3/21	11pm - 7am	Dori Votolato-Willis
Mon	21-Mar	7am - 3pm	Melissa Ralph
Mon	21-Mar	3pm-11pm	Amanda Nerret
Mon-Tues	3/21-3/22	11pm - 7am	Kelly Grimes
Tues	22-Mar	7am - 3pm	Melissa Ralph
Tues	22-Mar	3pm-11pm	Dori Votolato-Willis
Tues-Wed	3/22-3/23	11pm - 7am	Kelly Grimes
Wed	23-Mar	7am - 3pm	Melissa Ralph
Wed	23-Mar	3pm-11pm	Dori Votolato-Willis
Wed-Thur	3/23-3/24	11pm - 7am	Kelly Grimes
Thur	24-Mar	7am - 3pm	Wendy Reed
Thur	24-Mar	3pm-11pm	Dori Votolato-Willis
Thur-Fri	3/24-3/25	11pm - 7am	Jonathan Fiske
Fri	25-Mar	7am - 3pm	Amanda Nerret
Fri	25-Mar	3pm-11pm	Melissa Ralph
Fri-Sat	3/25-3/26	11pm-7am	Jonathan Fiske

EST Coordinator

Fri-Sat	3/18-3/19	11pm-7am	Rebecca Stone
Sat	19-Mar	7am - 3pm	Clyde Ragland
Sat	19-Mar	3pm-11pm	Tony Bowers
Sat-Sun	3/19-3/20	11pm - 7am	Rebecca Stone
Sun	20-Mar	7am - 3pm	Clyde Ragland
Sun	20-Mar	3pm-11pm	Tony Bowers
Sun-Mon	3/20-3/21	11pm - 7am	Rebecca Stone
Mon	21-Mar	7am - 3pm	Tony McMurtray
Mon	21-Mar	3pm-11pm	Tony Bowers
Mon-Tues	3/21-3/22	11pm - 7am	Rebecca Stone
Tues	22-Mar	7am - 3pm	Tony McMurtray
Tues	22-Mar	3pm-11pm	Clyde Ragland
Tues-Wed	3/22-3/23	11pm - 7am	Rebecca Stone
Wed	23-Mar	7am - 3pm	Tony McMurtray
Wed	23-Mar	3pm-11pm	Clyde Ragland
Wed-Thur	3/23-3/24	11pm - 7am	Rebecca Stone
Thur	24-Mar	7am - 3pm	Tony McMurtray
Thur	24-Mar	3pm-11pm	Clyde Ragland
Thur-Fri	3/24-3/25	11pm - 7am	Steve Campbell
Fri	25-Mar	7am - 3pm	Taylor Lichatz
Fri	25-Mar	3pm-11pm	Tony McMurtray
Fri-Sat	3/25-3/26	11pm-7am	Steve Campbell

EST Chronology Officer

Fri-Sat	3/18-3/19	11pm-7am	Dennis Gordon
Sat	19-Mar	7am - 3pm	Vanice Perrin
Sat	19-Mar	3pm-11pm	Rebecca Karas
Sat-Sun	3/19-3/20	11pm - 7am	Cynthia Dorsey
Sun	20-Mar	7am - 3pm	James Vaughn
Sun	20-Mar	3pm-11pm	Rebecca Karas
Sun-Mon	3/20-3/21	11pm - 7am	Mark Resner
Mon	21-Mar	7am - 3pm	Hector Rodriguez-Luccioni
Mon	21-Mar	3pm-11pm	Rebecca Karas

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE
MARCH 18-26

Mon-Tues	3/21-3/22	11pm - 7am	Thomas Scarbrough
Tues	22-Mar	7am - 3pm	Hector Rodriguez-Luccioni
Tues	22-Mar	3pm-11pm	Rebecca Karas
Tues-Wed	3/22-3/23	11pm - 7am	Thomas Scarbrough
Wed	23-Mar	7am - 3pm	James Vaughn
Wed	23-Mar	3pm-11pm	Rebecca Karas
Wed-Thur	3/23-3/24	11pm - 7am	Nick Ballam
Thur	24-Mar	7am - 3pm	Hector Rodriguez-Luccioni
Thur	24-Mar	3pm-11pm	Rebecca Karas
Thur-Fri	3/24-3/25	11pm - 7am	Thomas Scarbrough
Fri	25-Mar	7am - 3pm	Hector Rodriguez-Luccioni
Fri	25-Mar	3pm-11pm	Rebecca Karas
Fri-Sat	3/25-3/26	11pm-7am	Thomas Scarbrough
EST Response Ops Mgr			
Fri-Sat	3/18-3/19	11pm-7am	Omar Khan
Sat	19-Mar	7am - 3pm	Cris Brown
Sat	19-Mar	3pm-11pm	Bob Stransky
Sat-Sun	3/19-3/20	11pm - 7am	Jean Trefethan
Sun	20-Mar	7am - 3pm	Karen Jackson
Sun	20-Mar	3pm-11pm	Roberto Figueroa
Sun-Mon	3/20-3/21	11pm - 7am	Jean Trefethan
Mon	21-Mar	7am - 3pm	Bob Stransky
Mon	21-Mar	3pm-11pm	Omar Khan
Mon-Tues	3/21-3/22	11pm - 7am	Cris Brown
Tues	22-Mar	7am - 3pm	Bob Stransky
Tues	22-Mar	3pm-11pm	Karen Jackson
Tues-Wed	3/22-3/23	11pm - 7am	Roberto Figueroa
Wed	23-Mar	7am - 3pm	Bob Stransky
Wed	23-Mar	3pm-11pm	Jean Trefethan
Wed-Thur	3/23-3/24	11pm - 7am	Cris Brown
Thur	24-Mar	7am - 3pm	Karen Jackson
Thur	24-Mar	3pm-11pm	Omar Khan
Thur-Fri	3/24-3/25	11pm - 7am	Roberto Figueroa
Fri	25-Mar	7am - 3pm	Jean Trefethan
Fri	25-Mar	3pm-11pm	Cris Brown
Fri-Sat	3/25-3/26	11pm-7am	Roberto Figueroa
EST Admin. Assistant			
Fri-Sat	3/18-3/19	11pm-7am	Tabitha Howard
Sat	19-Mar	7am - 3pm	Karen Meyer
Sat	19-Mar	3pm-11pm	Amy Salus
Sat-Sun	3/19-3/20	11pm - 7am	Chris Lamb
Sun	20-Mar	7am - 3pm	Karen Meyer
Sun	20-Mar	3pm-11pm	Linda Williamson
Sun-Mon	3/20-3/21	11pm - 7am	Chris Lamb
Mon	21-Mar	7am - 3pm	Karen Meyer
Mon	21-Mar	3pm-11pm	Mary Glenn Crutchley
Mon-Tues	3/21-3/22	11pm - 7am	Andrea Wimbush
Tues	22-Mar	7am - 3pm	Cynthia Dorsey
Tues	22-Mar	3pm-11pm	Mary Glenn Crutchley
Tues-Wed	3/22-3/23	11pm - 7am	Michelle Manahan

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE
MARCH 18-26

Wed	23-Mar	7am - 3pm	Karen Meyer
Wed	23-Mar	3pm-11pm	Mary Glenn Crutchley
Wed-Thur	3/23-3/24	11pm - 7am	Andrea Wimbush
Thur	24-Mar	7am - 3pm	Cynthia Dorsey
Thur	24-Mar	3pm-11pm	Mary Glenn Crutchley
Thur-Fri	3/24-3/25	11pm - 7am	Tabitha Howard
Fri	25-Mar	7am - 3pm	Karen Meyer
Fri	25-Mar	3pm-11pm	Michelle Manahan
Fri-Sat	3/25-3/26	11pm-7am	Linda Williamson

Liaison Team

LT Director			
Fri-Sat	3/18-3/19	11pm-7am	Tom Blount
Sat	19-Mar	7am - 3pm	Tom Bergman
Sat	19-Mar	3pm-11pm	Bob Webber
Sat-Sun	3/19-3/20	11pm - 7am	John Adams
Sun	20-Mar	7am - 3pm	Tom Bergman
Sun	20-Mar	3pm-11pm	Bob Webber
Sun-Mon	3/20-3/21	11pm - 7am	John Adams
Mon	21-Mar	7am - 3pm	Tom Bergman
Mon	21-Mar	3pm-11pm	Bob Webber
Mon-Tues	3/21-3/22	11pm - 7am	John Adams
Tues	22-Mar	7am - 3pm	Tom Bergman
Tues	22-Mar	3pm-11pm	Bob Webber
Tues-Wed	3/22-3/23	11pm - 7am	John Adams
Wed	23-Mar	7am - 3pm	Michael Tschiltz
Wed	23-Mar	3pm-11pm	Rich Correia
Wed-Thur	3/23-3/24	11pm - 7am	Jake Zimmerman
Thur	24-Mar	7am - 3pm	Michael Tschiltz
Thur	24-Mar	3pm-11pm	Rich Correia
Thur-Fri	3/24-3/25	11pm - 7am	Jake Zimmerman
Fri	25-Mar	7am - 3pm	Michael Tschiltz
Fri	25-Mar	3pm-11pm	Rich Correia
Fri-Sat	3/25-3/26	11pm-7am	Jake Zimmerman

LT Coordinator			
Fri-Sat	3/18-3/19	11pm-7am	Janelle Jessie
Sat	19-Mar	7am - 3pm	Jeff Temple
Sat	19-Mar	3pm-11pm	Rani Franovich
Sat-Sun	3/19-3/20	11pm - 7am	Janelle Jessie
Sun	20-Mar	7am - 3pm	Jeff Temple
Sun	20-Mar	3pm-11pm	Nathan Sanfilippo
Sun-Mon	3/20-3/21	11pm - 7am	Milt Murray
Mon	21-Mar	7am - 3pm	Jeff Temple
Mon	21-Mar	3pm-11pm	Nathan Sanfilippo
Mon-Tues	3/21-3/22	11pm - 7am	Milt Murray
Tues	22-Mar	7am - 3pm	Rani Franovich
Tues	22-Mar	3pm-11pm	Nathan Sanfilippo
Tues-Wed	3/22-3/23	11pm - 7am	Milt Murray
Wed	23-Mar	7am - 3pm	Rani Franovich
Wed	23-Mar	3pm-11pm	Jeff Temple

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE
MARCH 18-26

Wed-Thur	3/23-3/24	11pm - 7am	Milt Murray
Thur	24-Mar	7am - 3pm	Rani Franovich
Thur	24-Mar	3pm-11pm	Jeff Temple
Thur-Fri	3/24-3/25	11pm - 7am	Milt Murray
Fri	25-Mar	7am - 3pm	Janelle Jessie
Fri	25-Mar	3pm-11pm	Rani Franovich
Fri-Sat	3/25-3/26	11pm-7am	Milt Murray
LT State Liaison			
Thur-Fri	3/17-3/18	9pm-7am	Ryan/Turttil (ON CALL ONLY)
Fri	18-Mar	7am-2pm	Lukes/Flannery
Fri	18-Mar	2pm-9pm	Turttil/Maupin
Fri-Sat	3/18-3/19	9pm-7am	Ryan/Turttil (ON CALL ONLY)
Sat	19-Mar	7am-2pm	Ryan/Turttil (ON CALL ONLY)
Sat	19-Mar	2pm-9pm	Ryan/Turttil (ON CALL ONLY)
Sat-Sun	3/19-3/20	9pm-7am	Ryan/Turttil (ON CALL ONLY)
Sun	20-Mar	7am-2pm	Ryan/Turttil (ON CALL ONLY)
Sun	20-Mar	2pm-9pm	Ryan/Turttil (ON CALL ONLY)
Sun-Mon	3/20-3/21	9pm-7am	Ryan/Turttil (ON CALL ONLY)
Mon	21-Mar	7am-2pm	Flannery (Riveria-On Call)
Mon	21-Mar	2pm-9pm	Easson (Turttil-On Call)
Mon-Tue	3/21-3/22	9pm-7am	Ryan/Turttil
Tue	22-Mar	7am-2pm	Flannery (Riveria-On Call)
Tue	22-Mar	2pm-9pm	Easson (Turttil-On Call)
Tue-Wed	3/22-3/23	9pm-7am	Ryan/Turttil
Wed	23-Mar	7am-2pm	Maupin (Lukes-On Call)
Wed	23-Mar	2pm-9pm	Rivera (Easson-On Call)
Wed-Thur	3/23-3/24	9pm-7am	Ryan/Turttil
Thur	24-Mar	7am-2pm	Lukes (Flannery-On Call)
Thur	24-Mar	2pm-9pm	Maupin (Riveria-On Call)
Thur-Fri	3/24-3/25	9pm-7am	Ryan/Turttil
Fri	25-Mar	7am-2pm	Ryan (Maupin-On Call)
Fri	25-Mar	2pm-9pm	Turttil (Riveria-On Call)
Fri-Sat	3/25-3/26	9pm-7am	Ryan/Turttil (ON CALL ONLY)
LT Federal Liaison (2)			
Fri-Sat	3/18-3/19	11pm-7am	Scott Sloan
Sat	19-Mar	7am - 3pm	Russ Chazell
Sat	19-Mar	3pm-11pm	Jeff Lynch
Sat-Sun	3/19-3/20	11pm - 7am	Scott Sloan
Sun	20-Mar	7am - 3pm	Ned Wright
Sun	20-Mar	3pm-11pm	Jerry Hale
Sun-Mon	3/20-3/21	11pm - 7am	Lisa Wright
Mon	21-Mar	7am - 3pm	Beth Reed/Ted Smith
Mon	21-Mar	3pm-11pm	Ned Wright
Mon-Tues	3/21-3/22	11pm - 7am	Lisa Wright
Tues	22-Mar	7am - 3pm	Beth Reed/Ted Smith
Tues	22-Mar	3pm-11pm	Ned Wright
Tues-Wed	3/22-3/23	11pm - 7am	Lisa Wright
Wed	23-Mar	7am - 3pm	Jerry Hale/Ted Smith
Wed	23-Mar	3pm-11pm	Ned Wright
Wed-Thur	3/23-3/24	11pm - 7am	Lisa Wright

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE
MARCH 18-26

Thur	24-Mar	7am - 3pm	Ted Smith/Bethany Cecere
Thur	24-Mar	3pm-11pm	Jerry Hale
Thur-Fri	3/24-3/25	11pm - 7am	Scott Sloan
Fri	25-Mar	7am - 3pm	Ted Smith/Bethany Cecere
Fri	25-Mar	3pm-11pm	Jerry Hale
Fri-Sat	3/25-3/26	11pm-7am	Scott Sloan
LT Congressional Liaison (2)			
Sat	19-Mar	7am - 2pm	Spiros Droggitis
	19-Mar	2pm-9pm	Tim Riley
Sun	20-Mar	7am - 2pm	Rebecca Schmidt
	20-Mar	2pm-9pm	Reanne Shane
Mon	21-Mar	7am - 2pm	Spiros Droggitis
	21-Mar	2pm-9pm	Tim Riley
Tues	22-Mar	7am - 2pm	Tim Riley
	22-Mar	2pm-9pm	Spiros Droggitis
Wed	23-Mar	7am - 2pm	Gene Dacus
	23-Mar	2pm-9pm	Raeann Shane
Thur	24-Mar	7am - 2pm	Spiros Droggitis
	24-Mar	2pm-9pm	Raeann Shane
Fri	25-Mar	7am - 2pm	Gene Dacus
	25-Mar	2pm-9pm	Amy Powell
LT International Liaison (2)			
Fri-Sat	3/18-3/19	11pm-7am	Elizabeth Smirolido/Danielle Emche
Sat	19-Mar	7am - 3pm	Lance English/Steve Bloom
Sat	19-Mar	3pm-11pm	Jenny Tobin/Jill Shephard
Sat-Sun	3/19-3/20	11pm - 7am	Elizabeth Smirolido/Danielle Emche
Sun	20-Mar	7am - 3pm	Karen Henderson/Steve Baker
Sun	20-Mar	3pm-11pm	Eric Stahl/Nancy Fragoyanis
Sun-Mon	3/20-3/21	11pm - 7am	Elizabeth Smirolido/Jenny Tobin
Mon	21-Mar	7am - 3pm	Jen Schwartzman/Charlotte Abrams/Nancy (12-3)
Mon	21-Mar	3pm-11pm	Danielle Emche/Lauren Mayros
Mon-Tues	3/21-3/22	11pm - 7am	Eric Stahl/Mugeh Afshar-Tous
Tues	22-Mar	7am - 3pm	Jen Schwartzman/Charlotte Abrams/Nancy (12-3)
Tues	22-Mar	3pm-11pm	Danielle Emche/Lauren Mayros
Tues-Wed	3/22-3/23	11pm - 7am	Eric Stahl/Mugeh
Wed	23-Mar	7am - 3pm	Jen Schwartzman/Charlotte Abrams/Nancy (12-3)
Wed	23-Mar	3pm-11pm	Danielle Emche/Lauren Mayros
Wed-Thur	3/23-3/24	11pm - 7am	Eric Stahl/Mugeh
Thur	24-Mar	7am - 3pm	Steve Bloom/Lance English
Thur	24-Mar	3pm-11pm	Janice/Jenny Tobin
Thur-Fri	3/24-3/25	11pm - 7am	Andrea/Elizabeth Smirolido
Fri	25-Mar	7am - 3pm	Steve Bloom/Lance English
Fri	25-Mar	3pm-11pm	Janice/Jenny Tobin
Fri-Sat	3/25-3/26	11pm-7am	Andrea/Elizabeth Smirolido
Protective Measures Team			
PMTR Director			
Fri-Sat	3/18-3/19	11pm-7am	Kathy Gibson
Sat	19-Mar	7am - 3pm	John Lubinski

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE
MARCH 18-26

Sat	19-Mar	3pm-11pm	Don Cool
Sat-Sun	3/19-3/20	11pm - 7am	Kathy Gibson
Sun	20-Mar	7am - 3pm	John Lubinski
Sun	20-Mar	3pm-11pm	Don Cool
Sun-Mon	3/20-3/21	11pm - 7am	Kathy Gibson
Mon	21-Mar	7am - 3pm	John Lubinski
Mon	21-Mar	3pm-11pm	Don Cool
Mon-Tues	3/21-3/22	11pm - 7am	John Tappert
Tues	22-Mar	7am - 3pm	John Lubinski
Tues	22-Mar	3pm-11pm	Don Cool
Tues-Wed	3/22-3/23	11pm - 7am	John Tappert
Wed	23-Mar	7am - 3pm	Terry Reis
Wed	23-Mar	3pm-11pm	Cindy Jones
Wed-Thur	3/23-3/24	11pm - 7am	Randy Sullivan
Thur	24-Mar	7am - 3pm	Terry Reis
Thur	24-Mar	5pm-11pm	Cindy Jones
Thur-Fri	3/24-3/25	11pm - 7am	Randy Sullivan
Fri	25-Mar	7am - 3pm	Terry Reis
Fri	25-Mar	5pm-11pm	Cindy Jones
Fri-Sat	3/25-3/26	11pm-7am	Randy Sullivan
PMTR Coordinator			
Fri-Sat	3/18-3/19	11pm-7am	Mike Norris
Sat	19-Mar	7am - 3pm	Duane Hardesty
Sat	19-Mar	3pm-11pm	Jay Patel
Sat-Sun	3/19-3/20	11pm - 7am	Lou Brandon
Sun	20-Mar	7am - 3pm	Nima Ashkeboussi
Sun	20-Mar	3pm-11pm	Jay Patel
Sun-Mon	3/20-3/21	11pm - 7am	Lou Brandon
Mon	21-Mar	7am - 3pm	Prosanta Chowdhury (8 am)
Mon	21-Mar	3pm-11pm	Jay Patel
Mon-Tues	3/21-3/22	11pm - 7am	Lou Brandon
Tues	22-Mar	7am - 3pm	Prosanta Chowdhury (8 am)
Tues	22-Mar	3pm-11pm	Nima Ashkeboussi
Tues-Wed	3/22-3/23	11pm - 7am	Mike Norris
Wed	23-Mar	7am - 3pm	John Wray
Wed	23-Mar	3pm-11pm	Nima Ashkeboussi
Wed-Thur	3/23-3/24	11pm - 7am	Mike Norris
Thur	24-Mar	7am - 3pm	John Wray
Thur	24-Mar	3pm-11pm	Nima Ashkeboussi
Thur-Fri	3/24-3/25	11pm - 7am	Mike Norris
Fri	25-Mar	7am - 3pm	Duane Hardesty
Fri	25-Mar	3pm-11pm	Jay Patel
Fri-Sat	3/25-3/26	11pm-7am	Lou Brandon
PMTR Prot Actions Asst Dir			
Fri-Sat	3/18-3/19	11pm-7am	Greg Casto
Sat	19-Mar	7am - 3pm	Kathryn Brock
Sat	19-Mar	3pm-11pm	Kevin Williams
Sat-Sun	3/19-3/20	11pm - 7am	Greg Casto
Sun	20-Mar	7am - 3pm	Kathryn Brock
Sun	20-Mar	3pm-11pm	Tim Harris

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE
MARCH 18-26

Sun-Mon	3/20-3/21	11pm - 7am	Greg Casto (Jessica Kratchman - to shadow)
Mon	21-Mar	7am - 3pm	Kathryn Brock
Mon	21-Mar	3pm-11pm	Dan Barss
Mon-Tues	3/21-3/22	11pm - 7am	Jessica Kratchman
Tues	22-Mar	7am - 3pm	Kathryn Brock
Tues	22-Mar	3pm-11pm	Tim Harris
Tues-Wed	3/22-3/23	11pm - 7am	Jessica Kratchman
Wed	23-Mar	7am - 3pm	Sandra Wastler
Wed	23-Mar	3pm-11pm	Vince Holahan
Wed-Thur	3/23-3/24	11pm - 7am	Jessica Kratchman
Thur	24-Mar	7am - 3pm	Sandra Wastler
Thur	24-Mar	3pm-11pm	Stacey Rosenberg
Thur-Fri	3/24-3/25	11pm - 7am	Jessica Kratchman
Fri	25-Mar	7am - 3pm	Kathryn Brock
Fri	25-Mar	3pm-11pm	Vince Holahan
Fri-Sat	3/25-3/26	11pm-7am	Greg Casto
PMTR RAAD			
Fri-Sat	3/18-3/19	11pm-7am	Randy Sullivan
Sat	19-Mar	7am - 3pm	Bruce Watson
Sat	19-Mar	3pm-11pm	Michelle Hart
Sat-Sun	3/19-3/20	11pm - 7am	Patricia Milligan
Sun	20-Mar	7am - 3pm	Eric Schrader
Sun	20-Mar	3pm-11pm	Steve LaVie
Sun-Mon	3/20-3/21	11pm - 7am	Mike Norris
Mon	21-Mar	7am - 3pm	Michelle Hart
Mon	21-Mar	3pm-11pm	Steve Lavie
Mon-Tues	3/21-3/22	11pm - 7am	Boby Abu-Eid
Tues	22-Mar	7am - 3pm	Bruce Watson
Tues	22-Mar	3pm-11pm	Steve LaVie
Tues-Wed	3/22-3/23	11pm - 7am	Boby Abu-Eid
Wed	23-Mar	7am - 3pm	Bruce Watson
Wed	23-Mar	3pm-11pm	Michelle Hart
Wed-Thur	3/23-3/24	11pm - 7am	Patricia Milligan
Thur	24-Mar	7am - 3pm	Bruce Watson
Thur	24-Mar	3pm-11pm	Steve LaVie
Thur-Fri	3/24-3/25	11pm - 7am	Cynthia Barr
Fri	25-Mar	7am - 3pm	Randy Sullivan
Fri	25-Mar	3pm-11pm	Michelle Hart
Fri-Sat	3/25-3/26	11pm-7am	Cynthia Barr
PMTR Dose Assessment (RASCAL)			
Fri-Sat	3/18-3/19	11pm-7am	Duane Schmidt/Tony Huffert
Sat	19-Mar	7am - 3pm	Casper Sun / Joe DeCicco (10am arrive)
Sat	19-Mar	3pm-11pm	Margaret Cervera / Joe DeCicco
Sat-Sun	3/19-3/20	11pm - 7am	Kimberly Gambone/John Parillo
Sun	20-Mar	7am - 3pm	Casper Sun / Duane Schmidt
Sun	20-Mar	3pm-11pm	Margaret Cervera / Tony Huffert
Sun-Mon	3/20-3/21	11pm - 7am	Kimberly Gambone/John Parillo
Mon	21-Mar	7am - 3pm	Eric Schrader/Rich Clement
Mon	21-Mar	3pm-11pm	Margaret Cervera/Tony Huffert
Mon-Tues	3/21-3/22	11pm - 7am	John Parillo / Bernie White

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE
MARCH 18-26

Tues	22-Mar	7am - 3pm	Eric Schrader/Rich Clement
Tues	22-Mar	3pm-11pm	Gary Purdy/Casper Sun
Tues-Wed	3/22-3/23	11pm - 7am	Margaret Cervera/Tony Huffert
Wed	23-Mar	7am - 3pm	Eric Schrader/Rich Clement
Wed	23-Mar	3pm-11pm	Kimberly Gambone/Casper Sun
Wed-Thur	3/23-3/24	11pm - 7am	Tony Huffert/John Parillo
Thur	24-Mar	7am - 3pm	Eric Schrader/Rich Clement
Thur	24-Mar	3pm-11pm	Kimberly Gambone/Casper Sun
Thur-Fri	3/24-3/25	11pm - 7am	Tony Huffert/John Parillo
Fri	25-Mar	7am - 3pm	Eric Schrader/Rich Clement
Fri	25-Mar	3pm-11pm	Gary Purdy/Casper Sun
Fri-Sat	3/25-3/26	11pm-7am	John Parillo / Bernie White
PMTR GIS Analyst			
Fri-Sat	3/18-3/19	11pm-7am	Stephanie Devlin
Sat	19-Mar	7am - 3pm	Nebiyu Tiruneh
Sat	19-Mar	3pm-11pm	Yong Li
Sat-Sun	3/19-3/20	11pm - 7am	Alice Stieve
Sun	20-Mar	7am - 3pm	Phil Brandt
Sun	20-Mar	3pm-11pm	Ken See
Sun-Mon	3/20-3/21	11pm - 7am	Alice Stieve
Mon	21-Mar	7am - 3pm	Nebiyu Tiruneh
Mon	21-Mar	3pm-11pm	Stephanie Devlin
Mon-Tues	3/21-3/22	11pm - 7am	Alice Stieve
Tues	22-Mar	7am - 3pm	Yong Li
Tues	22-Mar	3pm-11pm	Stephanie Devlin
Tues-Wed	3/22-3/23	11pm - 7am	Alice Stieve
Wed	23-Mar	7am - 3pm	Allen Gross
Wed	23-Mar	3pm-11pm	Stephanie Devlin
Wed-Thur	3/23-3/24	11pm - 7am	Phil Brandt
Thur	24-Mar	7am - 3pm	Yong Li
Thur	24-Mar	3pm-11pm	Stephanie Devlin
Thur-Fri	3/24-3/25	11pm - 7am	Dogan Seber
Fri	25-Mar	7am - 3pm	Hosang Ahn
Fri	25-Mar	3pm-11pm	Stephanie Devlin
Fri-Sat	3/25-3/26	11pm-7am	Phil Brandt
PMTR Meteorologist			
Fri-Sat	18-Mar	3pm-11pm	Mike Mazaika
Sat	3/18-3/19	11pm-7am	Dave Brown
Sat	19-Mar	7am - 3pm	Kevin Quinlan
Sat-Sun	19-Mar	3pm-11pm	Mike Mazaika
Sun	3/19-3/20	11pm - 7am	David Brown
Sun	20-Mar	7am - 3pm	Kevin Quinlan
Sun	20-Mar	3pm-11pm	Mike Mazaika
Sun-Mon	3/20-3/21	11pm - 7am	David Brown
Mon	21-Mar	7am - 3pm	Mike Mazaika
Mon	21-Mar	3pm-11pm	Brad Harvey
Mon-Tues	3/21-3/22	11pm - 7am	Kevin Quinlan
Tues	22-Mar	7am - 3pm	David Brown
Tues	22-Mar	3pm-11pm	Brad Harvey
Tues-Wed	3/22-3/23	11pm - 7am	Andy Imboden/Kevin Quinlan

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE
MARCH 18-26

Wed	23-Mar	7am - 3pm	Mike Mazaika
Wed	23-Mar	3pm-11pm	Brad Harvey
Wed-Thur	3/23-3/24	11pm - 7am	Kevin Quinlan
Thur	24-Mar	7am - 3pm	David Brown
Thur	24-Mar	3pm-11pm	Brad Harvey
Thur-Fri	3/24-3/25	11pm - 7am	Kevin Quinlan
Fri	25-Mar	7am - 3pm	Mike Mazaika
Fri	25-Mar	3pm-11pm	Brad Harvey
Fri-Sat	3/25-3/26	11pm-7am	Kevin Quinlan

Reactor Safety Team

RST Director			
Fri-Sat	3/18-3/19	11pm-7am	Jennifer Uhle
Sat	19-Mar	7am - 3pm	Laura Dudes
Sat	19-Mar	3pm-11pm	Dave Skeen
Sat-Sun	3/19-3/20	11pm - 7am	Jennifer Uhle
Sun	20-Mar	7am - 3pm	Laura Dudes
Sun	20-Mar	3pm-11pm	Dave Skeen
Sun-Mon	3/20-3/21	11pm - 7am	Jennifer Uhle
Mon	21-Mar	7am - 3pm	Fred Brown
Mon	21-Mar	3pm-11pm	Dave Skeen
Mon-Tues	3/21-3/22	11pm - 7am	Jennifer Uhle
Tues	22-Mar	7am - 3pm	Fred Brown
Tues	22-Mar	3pm-11pm	Dave Skeen
Tues-Wed	3/22-3/23	11pm - 7am	Brian Holian
Wed	23-Mar	7am - 3pm	Fred Brown
Wed	23-Mar	3pm-11pm	Bill Ruland
Wed-Thur	3/23-3/24	11pm - 7am	Brian Holian
Thur	24-Mar	7am - 3pm	Fred Brown
Thur	24-Mar	3pm-11pm	Bill Ruland
Thur-Fri	3/24-3/25	11pm - 7am	Brian Holian
Fri	25-Mar	7am - 3pm	Pat Hiland
Fri	25-Mar	3pm-11pm	Bill Ruland
Fri-Sat	3/25-3/26	11pm-7am	Brian Holian
Sat	26-Mar	7am - 3pm	Pat Hiland
Sat	26-Mar	3pm-11pm	Bill Ruland
Sat	3/26-27/2011	11pm - 7am	Mike Case

RST Coordinator			
Fri-Sat	3/18-3/19	11pm-7am	Rollie Berry
Sat	19-Mar	7am - 3pm	Scott Sloan
Sat	19-Mar	3pm-11pm	Oleg Bukharin
Sat-Sun	3/19-3/20	11pm - 7am	Frank Collins
Sun	20-Mar	7am - 3pm	Peter Alter
Sun	20-Mar	3pm-11pm	Eric Thomas
Sun-Mon	3/20-3/21	11pm - 7am	Mike Morlang
Mon	21-Mar	7am - 3pm	Peter Alter
Mon	21-Mar	3pm-11pm	Greg Schoenebeck
Mon-Tues	3/21-3/22	11pm - 7am	Frank Collins
Tues	22-Mar	7am - 3pm	Rick Hasselberg
Tues	22-Mar	3pm-11pm	Mike Morlang

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE
MARCH 18-26

Tues-Wed	3/22-3/23	11pm - 7am	Oleg Bukharin
Wed	23-Mar	7am - 3pm	Eric Thomas
Wed	23-Mar	3pm-11pm	Greg Schoenebeck
Wed-Thur	3/23-3/24	11pm - 7am	Frank Collins
Thur	24-Mar	7am - 3pm	Rick Hasselberg
Thur	24-Mar	3pm-11pm	Brett Rini
Thur-Fri	3/24-3/25	11pm - 7am	Tom Boyce (RES)
Fri	25-Mar	7am - 3pm	Eric Thomas
Fri	25-Mar	3pm-11pm	Brett Rini
Fri-Sat	3/25-3/26	11pm-7am	Frank Collins
Severe Accident/PRA			
Fri-Sat	3/18-3/19	11pm - 7am	Don Marksberry
Sat	19-Mar	7am - 3pm	Len Ward
Sat	19-Mar	3pm-11pm	Ed Fuller
Sat-Sun	3/19-3/20	11pm - 7am	Mike Salay
Sun	20-Mar	7am - 3pm	John Lane
Sun	20-Mar	3pm-11pm	Jim Gilmer
Sun-Mon	3/20-3/21	11pm - 7am	Don Dube
Mon	21-Mar	7am - 3pm	Jeff Circle
Mon	21-Mar	3pm-11pm	Hossein Esmaili
Mon-Tues	3/21-3/22	11pm - 7am	Jim Gilmer
Tues	22-Mar	7am - 3pm	Ed Fuller
Tues	22-Mar	3pm-11pm	Len Ward
Tues-Wed	3/22-3/23	11pm - 7am	Hossein Esmaili
Wed	23-Mar	7am - 3pm	Jeff Circle
Wed	23-Mar	3pm-11pm	Sam Miranda
Wed-Thur	3/23-3/24	11pm - 7am	Mike Salay
Thur	24-Mar	7am - 3pm	Jeff Circle
Thur	24-Mar	3pm-11pm	Steve Laur
Thur-Fri	3/24-3/25	11pm - 7am	Don Helton
Fri	25-Mar	7am - 3pm	Steven Arndt
Fri	25-Mar	3pm-11pm	Steve Laur
Fri-Sat	3/25-3/26	11pm-7am	Don Helton
BWR Expertise			
Fri-Sat	3/18-3/19	11pm-7am	Mike Brown
Sat	19-Mar	7am - 3pm	Peter Alter
Sat	19-Mar	3pm-11pm	Chuck Norton
Sat-Sun	3/19-3/20	11pm - 7am	John Kauffman
Sun	20-Mar	7am - 3pm	Larry Vick
Sun	20-Mar	3pm-11pm	Chuck Norton
Sun-Mon	3/20-3/21	11pm - 7am	Mike Brown
Mon	21-Mar	7am - 3pm	Bob Summers
Mon	21-Mar	3pm-11pm	Chuck Norton
Mon-Tues	3/21-3/22	11pm - 7am	Mike Brown
Tues	22-Mar	7am - 3pm	Tom Boyce (RES)
Tues	22-Mar	3pm-11pm	Chuck Norton
Tues-Wed	3/22-3/23	11pm - 7am	Mike Brown
Wed	23-Mar	7am - 3pm	Larry Vick
Wed	23-Mar	3pm-11pm	Chuck Norton
Wed-Thur	3/23-3/24	11pm - 7am	Eva Brown

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE
MARCH 18-26

Thur	24-Mar	7am - 3pm	Peter Alter
Thur	24-Mar	3pm-11pm	Chuck Norton
Thur-Fri	3/24-3/25	11pm - 7am	Eva Brown
Fri	25-Mar	7am - 3pm	Bob Summers
Fri	25-Mar	3pm-11pm	Chuck Norton
Fri-Sat	3/25-3/26	11pm-7am	Eva Brown
RST Comm/ERDS Operator			
Fri-Sat	3/18-3/19	11pm-7am	Andy Kugler
Sat	19-Mar	7am - 3pm	Joseph Williams
Sat	19-Mar	3pm-11pm	John Thorp
Sat-Sun	3/19-3/20	11pm - 7am	Ujagar Bhachu
Sun	20-Mar	7am - 3pm	Denise McGovern
Sun	20-Mar	3pm-11pm	Donna Williams
Sun-Mon	3/20-3/21	11pm - 7am	Ujagar Bhachu
Mon	21-Mar	7am - 3pm	Joseph Williams
Mon	21-Mar	3pm-11pm	John Thorp
Mon-Tues	3/21-3/22	11pm - 7am	Bill Roggenbrodt
Tues	22-Mar	7am - 3pm	Steve Bloom
Tues	22-Mar	3pm-11pm	Jim Isom
Tues-Wed	3/22-3/23	11pm - 7am	Bill Roggenbrodt
Wed	23-Mar	7am - 3pm	Joseph Williams
Wed	23-Mar	3pm-11pm	Ken Hart
Wed-Thur	3/23-3/24	11pm - 7am	Bill Roggenbrodt
Thur	24-Mar	7am - 3pm	Andrew Kugler
Thur	24-Mar	3pm-11pm	John Thorp
Thur-Fri	3/24-3/25	11pm - 7am	Bill Roggenbrodt
Fri	25-Mar	7am - 3pm	Donna Williams
Fri	25-Mar	3pm-11pm	Jim Isom
Fri-Sat	3/25-3/26	11pm-7am	David Solorio
RST Support (Seismology Q&A)			
Fri-Sat	3/18-3/19	11pm-7am	Off (On Call)
Sat	19-Mar	7am - 3pm	Off (On Call)
Sat	19-Mar	3pm-11pm	Off (On Call)
Sat-Sun	3/19-3/20	11pm - 7am	Alice Stieve (On Call) Working as PMT GIS
Sun	20-Mar	7am - 3pm	Cliff Munson (On Call)
Sun	20-Mar	3pm-11pm	Annie Kammerer (On Call)
Sun-Mon	3/20-3/21	11pm - 7am	Stephanie Devlin (On Call)
Mon	21-Mar	7am - 3pm	Cliff Munson (On Call)
Mon	21-Mar	3pm-11pm	A. Kammerer 3-11; M. Bensi 3-6 (On Call)
Mon-Tues	3/21-3/22	11pm - 7am	Dogan Seber (On Call)
Tues	22-Mar	7am - 3pm	Nilesh Chokchi On Call)
Tues	22-Mar	3pm-11pm	S. Devlin 3-11; M. Bensi 3-6 (On Call)
Tues-Wed	3/22-3/23	11pm - 7am	Cliff Munson (On Call)
Wed	23-Mar	7am - 3pm	Nilesh Chokchi On Call)
Wed	23-Mar	3pm-11pm	A. Kammerer 3-11, M. Bensi 3-6 (On Call)
Wed-Thur	3/23-3/24	11pm - 7am	Annie Kammerer (On Call)
Thur	24-Mar	7am - 3pm	Cliff Munson (On Call)
Thur	24-Mar	3pm-11pm	A. Kammerer 3-11, M. Bensi 3-6 (On Call)
Thur-Fri	3/24-3/25	11pm - 7am	Dogan Seber (On Call)
Fri	25-Mar	7am - 3pm	Dogan Seber (On Call)

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE
MARCH 18-26

Fri	25-Mar	3pm-11pm	A.Kammerer 3-11, M. Bensi 3-6 (On Call)
Fri-Sat	3/25-3/26	11pm-7am	Dogan Seber (On Call)
RST Support (Structural)			
Fri-Sat	3/18-3/19	11pm-7am	Off (On Call)
Sat	19-Mar	7am - 3pm	Off (On Call)
Sat	19-Mar	3pm-11pm	Off (On Call)
Sat-Sun	3/19-3/20	11pm - 7am	Off (On Call)
Sun	20-Mar	7am - 3pm	Off (On Call)
Sun	20-Mar	3pm-11pm	Off (On Call)
Sun-Mon	3/20-3/21	11pm - 7am	Off (On Call)
Mon	21-Mar	7am - 3pm	Off (On Call)
Mon	21-Mar	3pm-11pm	Bret Tegeler (On Call)
Mon-Tues	3/21-3/22	11pm - 7am	Bret Tegeler (On Call)
Tues	22-Mar	7am - 3pm	Pravin Patel (On Call)
Tues	22-Mar	3pm-11pm	Bret Tegeler (On Call)
Tues-Wed	3/22-3/23	11pm - 7am	Bret Tegeler (On Call)
Wed	23-Mar	7am - 3pm	Pravin Patel (On Call)
Wed	23-Mar	3pm-11pm	Samir Chakrabart (On Call)
Wed-Thur	3/23-3/24	11pm - 7am	Samir Chakrabart (On Call)
Thur	24-Mar	7am - 3pm	Pravin Patel (On Call)
Thur	24-Mar	3pm-11pm	Jerry Chung (On Call)
Thur-Fri	3/24-3/25	11pm - 7am	Jerry Chung(On Call)
Fri	25-Mar	7am - 3pm	Pravin Patel (On Call)
Fri	25-Mar	3pm-11pm	Manas Chakravorty (On Call)
Fri-Sat	3/25-3/26	11pm-7am	Manas Chakravorty (On Call)

From: Sheehan, Neil
To: Harrington, Holly; Screnci, Diane; Dean, Bill
Subject: RE: Blog post up -- hope it helps
Date: Tuesday, March 22, 2011 3:45:05 PM

Terrific. Thanks!

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 3:18 PM
To: Sheehan, Neil; Screnci, Diane; Dean, Bill
Subject: Blog post up -- hope it helps

RRRR-272

From: Harrington, Holly
To: Hoc, PMT12; PMT03 Hoc
Subject: RE: Assumed plant conditions supporting March 16, 2011 NRC press release.docx
Date: Tuesday, March 22, 2011 3:48:00 PM

Sorry, my boss had some questions about the content. They are in red below:

Details Behind our March 16th Announcement

We're getting follow-up questions from the public on how the NRC reached the conclusions that prompted out the direction march 16 from the U.S. Embassy in Tokyo that U.S. citizens within 50 miles of the Fukushima reactors evacuate the area. I reached out to some of the technical experts to provide additional information about what went into two sets of computer calculations that were run.

Here is what they say:

Both assessments are hypothetical, stylized analyses of consequences of releases from the Fukushima nuclear power plant Units 2, 3 and 4. WHAT HAPPENED WITH UNIT 1 IN THESE CALCULATIONS?

The first assessment assumed release from one reactor unit, specifically Unit 2. It assumed all fuel melted and escaped from the reactor core, that containment failed, and it used actual meteorological conditions during early morning hours. The low dispersion characteristics included low wind speeds, relatively stable air, and light precipitation.

The assessment considered the conditions of the plant at the time and possible degrading conditions. The assumptions included total failure, sprays off, no removal mechanism (e.g., scrubbing), no mitigation by the operator. A ground level release was assumed with release duration of 16 hours.

The second assessment represented multiple unit failures, in this case Units 2 and 3 and the spent fuel pool (SFP) of Unit 4. Specifically, it assumed 30 percent core damage at Units 2 and 3, and 100 percent fuel damage for the Unit 4 spent fuel pool. The Unit 4 spent fuel pool was assumed to include only a full core offload from the current outage. To account for the combined inventories of the three units sources (i.e., from Units 2 and 3 and Unit 4 spent fuel pool), the staff adjusted the reactor power level, fuel burn up and number of assemblies, and included that in one calculation. This resulted in 917 assemblies in the core. (I do not understand that last sentence. If it read cores (plural) it might make sense)

The assumptions included total failure, sprays off, no removal mechanism (e.g., scrubbing), no mitigation by the operator. The meteorological conditions for the second assessment also assumed actual conditions with light precipitation, fairly stable wind conditions with occasional higher wind speeds and less stable atmospheric conditions, resulting in greater atmospheric dispersion. A ground level release was assumed with release duration of 15 hours.

RRRR-273

I hope this explanation is helpful.

Eliot Brenner
Public Affairs Director

From: Hoc, PMT12
Sent: Tuesday, March 22, 2011 3:10 PM
To: PMT03 Hoc; Harrington, Holly
Subject: RE: Assumed plant conditions supporting March 16, 2011 NRC press release.docx

Looks good

From: PMT03 Hoc
Sent: Tuesday, March 22, 2011 2:58 PM
To: Hoc, PMT12
Subject: FW: Assumed plant conditions supporting March 16, 2011 NRC press release.docx

FYI and action, if any.

Prosanta

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 2:56 PM
To: PMT03 Hoc; Shoop, Undine; Riley (OCA), Timothy
Subject: RE: Assumed plant conditions supporting March 16, 2011 NRC press release.docx

Thank you all for this information. We decided it might be useful to make this a blog post, as there were many commenters to the blog who posed a similar question. Please see attached. I'm assuming this was blessed by whomever needed to? (PMT?)

We'll run this tomorrow.

From: PMT03 Hoc
Sent: Tuesday, March 22, 2011 1:10 PM
To: Shoop, Undine; Harrington, Holly; Riley (OCA), Timothy
Subject: Assumed plant conditions supporting March 16, 2011 NRC press release.docx

From: [Brenner, Eliot](#)
To: [Harrington, Holly](#)
Subject: RE: blog post for tomorrow sometime; approved by PMT. OK?
Date: Tuesday, March 22, 2011 3:29:50 PM

See my questions and slight rewrites. I would run this past the techies first before it goes any farther.

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 3:15 PM
To: Brenner, Eliot
Subject: blog post for tomorrow sometime; approved by PMT. OK?

Details Behind our March 16th Announcement

We're getting follow-up questions from the public on how the NRC reached the conclusions that prompted out the direction march 16 from the U.S. Embassy in Tokyo that U.S. citizens within 50 miles of the Fukushima reactors evacuate the area. I reached out to some of the technical experts to provide additional information about what went into two sets of computer calculations that were run.

Here is what they say:

Both assessments are hypothetical, stylized analyses of consequences of releases from the Fukushima nuclear power plant Units 2, 3 and 4. WHAT HAPPENED WITH UNIT 1 IN THESE CALCULATIONS?

The first assessment assumed release from one reactor unit, specifically Unit 2. It assumed all fuel melted and escaped from the reactor core, that containment failed, and it used actual meteorological conditions during early morning hours. The low dispersion characteristics included low wind speeds, relatively stable air, and light precipitation.

The assessment considered the conditions of the plant at the time and possible degrading conditions. The assumptions included total failure, sprays off, no removal mechanism (e.g., scrubbing), no mitigation by the operator. A ground level release was assumed with release duration of 16 hours.

The second assessment represented multiple unit failures, in this case Units 2 and 3 and the spent fuel pool (SFP) of Unit 4. Specifically, it assumed 30 percent core damage at Units 2 and 3, and 100 percent fuel damage for the Unit 4 spent fuel pool. The Unit 4 spent fuel pool was assumed to include only a full core offload from the current outage. To account for the combined inventories of the three units sources (i.e., from Units 2 and 3 and Unit 4 spent fuel pool), the staff adjusted the reactor power level, fuel burn up and number of assemblies, and included that in one calculation. This resulted in 917 assemblies in the core. (I do not understand that last sentence. If it read cores (plural) it might make sense)

The assumptions included total failure, sprays off, no removal mechanism (e.g., scrubbing), no mitigation by the operator. The meteorological conditions for the second assessment also assumed actual conditions with light precipitation, fairly stable wind

RRRR-274

conditions with occasional higher wind speeds and less stable atmospheric conditions, resulting in greater atmospheric dispersion. A ground level release was assumed with release duration of 15 hours.

I hope this explanation is helpful.

Eliot Brenner
Public Affairs Director

From: Harrington, Holly
To: Sheehan, Neil; Screnci, Diane; Dean, Bill
Subject: Blog post up -- hope it helps
Date: Tuesday, March 22, 2011 3:17:00 PM

RRRR-275

From: Hoc, PMT12
To: PMT03 Hoc; Harrington, Holly
Subject: RE: Assumed plant conditions supporting March 16, 2011 NRC press release.docx
Date: Tuesday, March 22, 2011 3:09:57 PM

Looks good

From: PMT03 Hoc
Sent: Tuesday, March 22, 2011 2:58 PM
To: Hoc, PMT12
Subject: FW: Assumed plant conditions supporting March 16, 2011 NRC press release.docx

FYI and action, if any.

Prosanta

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 2:56 PM
To: PMT03 Hoc; Shoop, Undine; Riley (OCA), Timothy
Subject: RE: Assumed plant conditions supporting March 16, 2011 NRC press release.docx

Thank you all for this information. We decided it might be useful to make this a blog post, as there were many commenters to the blog who posed a similar question. Please see attached. I'm assuming this was blessed by whomever needed to? (PMT?)

We'll run this tomorrow.

From: PMT03 Hoc
Sent: Tuesday, March 22, 2011 1:10 PM
To: Shoop, Undine; Harrington, Holly; Riley (OCA), Timothy
Subject: Assumed plant conditions supporting March 16, 2011 NRC press release.docx

RRRR-276

Details Behind our March 16th Announcement

We're getting follow-up questions from the public on how we reached the conclusions that prompted our March 16th press release recommending that U.S. residents within 50 miles of the Fukushima reactors to evacuate. I reached out to some of the technical folks to provide you with some additional information on the two sets of computer calculations used to support the NRC recommendations.

Here is what they say:

Both assessments are hypothetical, stylized analyses of consequences of releases from the Fukushima nuclear power plant Units 2, 3 and 4.

The first assessment assumed release from one reactor unit, specifically Unit 2. It assumed an ex-vessel, unfiltered release from a totally failed containment, 100 percent fuel damage, and actual meteorological conditions during early morning hours. The low dispersion characteristics included low wind speeds, relatively stable air, and light precipitation.

The assessment considered the conditions of the plant at the time and possible degrading conditions. The assumptions included total failure, sprays off, no removal mechanism (e.g., scrubbing), no mitigation by the operator. A ground level release was assumed with release duration of 16 hours.

The second assessment represented multiple unit failures, in this case Units 2 and 3 and the spent fuel pool (SFP) of Unit 4. Specifically, it assumed 30 percent core damage at Units 2 and 3, and 100 percent fuel damage for the Unit 4 spent fuel pool. The Unit 4 spent fuel pool was assumed to include only a full core offload from the current outage. To account for the combined inventories of the three units sources (i.e., from Units 2 and 3 and Unit 4 spent fuel pool), the staff adjusted the reactor power level, fuel burnup and number of assemblies, and included that in one calculation. This resulted in 917 assemblies in the core.

The assumptions included total failure, sprays off, no removal mechanism (e.g., scrubbing), no mitigation by the operator. The meteorological conditions for the second assessment also assumed actual conditions with light precipitation, fairly stable wind conditions with occasional higher wind speeds and less stable atmospheric conditions, resulting in greater atmospheric dispersion. A ground level release was assumed with release duration of 15 hours.

I hope this explanation is helpful.

Eliot Brenner
Public Affairs Director

From: Harrington, Holly
To: Milligan, Patricia
Subject: RE: a new angle on the japan situation
Date: Tuesday, March 22, 2011 3:08:00 PM

Could be a whole new career avenue for you!

From: Milligan, Patricia
Sent: Tuesday, March 22, 2011 2:49 PM
To: Harrington, Holly
Subject: RE: a new angle on the japan situation

....have 'em take KI

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 2:34 PM
To: Milligan, Patricia
Subject: a new angle on the japan situation

<http://www.thehorse.com/ViewArticle.aspx?ID=17971>

RRRR-277

From: Harrington, Holly
To: Brenner, Eliot
Subject: RE: EPZ Blog
Date: Tuesday, March 22, 2011 2:46:00 PM

No waiting. It's up

From: Brenner, Eliot
Sent: Tuesday, March 22, 2011 2:46 PM
To: Harrington, Holly
Subject: RE: EPZ Blog

And you are waiting on what?

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 2:23 PM
To: Brenner, Eliot
Subject: EPZ Blog

Post is approved by PMT and Neil and I discussed and took out the question about FEMA and now we don't feel it needs to be looked at by FEMA. All my usual helpers are not in the office, so it would be considerable delay IMHO.

RRRR-278

From: Harrington, Holly
To: Milligan, Patricia
Subject: a new angle on the japan situation
Date: Tuesday, March 22, 2011 2:34:00 PM

<http://www.thehorse.com/ViewArticle.aspx?ID=17971>

RRRR-279

From: Harrington, Holly
To: Mroz (Sahm), Sara
Subject: Neil sent ahead and drafted a blog post
Date: Tuesday, March 22, 2011 2:29:00 PM

Sara – I'm sorry to have asked you to do this and then have it overtaken by events. This has been approved by PMT and Region 1 and we're ready to go up. We do not feel it needs FEMA OK since it only barely mentions FEMA and in a consistent way with other documents.

In other news, I have a question for you, so call when you have a minute 415-8203

DRAFT Blog Post

Whether by virtue of regular testing of sirens, mailings about emergency plans or possibly the receipt of potassium iodide (KI) pills, there are frequent reminders for those who live within a 10-mile radius of a U.S. nuclear power plant of the need to be ready should a significant event occur at the facility.

This area is known as the 10-mile Emergency Planning Zone (EPZ), and it is well established in federal regulations as the focal point of preparing for a severe accident at a reactor.

Some confusion has cropped up in the media and elsewhere recently regarding the size of EPZs in the wake of developments involving four of the six Fukushima Daiichi reactors in Japan. The source of this confusion appears to stem from the NRC advisory on March 16th for American citizens who were within 50 miles of the plant to evacuate:

<http://pbadupws.nrc.gov/docs/ML1108/ML110800133.pdf>.

The advisory to evacuate to 50 miles was based on calculations done by NRC experts indicating releases from the four hobbled Japanese reactors and two fuel pools could – and a key word here is *could* – possibly exceed conservatively set safe radiation-exposure limits for the public. This advisory was made using limited data and conservative assumptions.

On its face, this recommendation seems to be at odds with the size used for American EPZs. In fact, it was consistent with the same kind of approach that would be used in the United States should a comparable, although extremely unlikely, event take place here.

In November 1976, a federal task force was formed to look at salient emergency planning issues for U.S. nuclear power plants. Out of that comprehensive evaluation came a recommendation that a 10-mile-radius EPZ would assure that “prompt and effective actions can be taken to protect the public in the event of an accident” at a plant. This was based on research showing the most significant impacts of an accident would be expected in the immediate vicinity of a plant and therefore any initial protective actions, such as evacuations or sheltering in place, should be focused there.

RRRR - 280

Put another way, the projected radiation levels would not be expected to exceed EPA protective action dose guidelines (1 to 5 rems) beyond 10 miles under most accident scenarios.

That does not mean the protective actions could not expand beyond the 10-mile radius. Rather, emergency planners have always known such actions could be necessary if the situation warranted it. Indeed, U.S. nuclear power plants are required to consider and drill for the possibility of radiation releases that could have impacts up to 50 miles away, in addition to the required biennial exercises conducted in the vicinity of each nuclear power plant to assess implementation of the emergency plan within the 10-mile EPZ. Once every six years, each plant takes part in an exercise graded by the NRC and FEMA to demonstrate how it would handle such an event.

As a key NRC/FEMA report (NUREG 0654) <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0654/> on emergency planning states "In a particular emergency, protective actions might well be restricted to a small part of the planning zone. On the other hand, for the worst possible accidents, protective actions would need to be taken outside the planning zones."

The Japanese have been confronted with extremely challenging circumstances wrought by a record earthquake followed by a massive tsunami. As the NRC carefully monitored developments there, the agency used the best information available to it to make a protective action recommendation to the U.S. Embassy in Tokyo for Americans within 50 miles of the six-reactor Japanese site; which was experiencing problems in four reactors and two spent fuel pools.

Were a similar accident to occur in the U.S., the response would be guided by the same considerations. But it is worth noting the United States has no nuclear complexes of this size.

Once the salient facts regarding the events at Fukushima Daiichi are made clear to the NRC, it intends to assess its own regulations and practices for any pertinent lessons learned that can be applied here. This will include an assessment of current emergency planning guidance and policy.

As the NRC carefully monitored developments there, the agency used the best information available to it to make a protective action recommendation

More information on emergency planning for U.S. nuclear power plants is available on the NRC web site at: <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/fs-emerg-plan-prep-nuc-power.html> .

From: Harrington, Holly
To: OS Secretarys Operations Center
Subject: Tentative: 2011 Pacific Basin Earthquake/Tsunami ESF-8 Conference Call

RRRR-281

From: [Harrington, Holly](#)
To: [McIntyre, David](#)
Subject: FW: Plume
Date: Tuesday, March 22, 2011 2:26:00 PM

From: Wood, Chad [<mailto:Chad.R.Wood@dhs.gov>]
Sent: Thursday, March 17, 2011 4:20 PM
To: Harrington, Holly
Subject: RE: Plume

202 586 4940

From: prvs=0505cd20e=Holly.Harrington@nrc.gov [<mailto:prvs=0505cd20e=Holly.Harrington@nrc.gov>]
On Behalf Of Harrington, Holly
Sent: Thursday, March 17, 2011 3:29 PM
To: Wood, Chad
Subject: RE: Plume

Got a good number?

From: Wood, Chad [<mailto:Chad.R.Wood@dhs.gov>]
Sent: Thursday, March 17, 2011 2:24 PM
To: Harrington, Holly
Subject: Plume

Talked to EPA. Plume calls should go to DOE. That's where EPA is referring them now.

RRRR-282

From: [Harrington, Holly](#)
To: [OPA Resource](#)
Subject: RE: Westinghouse submitted Rev 18
Date: Tuesday, March 22, 2011 2:21:00 PM

Send to scott

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

From: Janbergs, Holly On Behalf Of OPA Resource
Sent: Tuesday, March 22, 2011 2:08 PM
To: Harrington, Holly
Subject: FW: Westinghouse submitted Rev 18

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

From: Totju Totev [<mailto:totev@anl.gov>]
Sent: Tuesday, March 22, 2011 2:05 PM
To: OPA Resource
Subject: Westinghouse submitted Rev 18

Below is the result of your feedback form. It was submitted by

Totju Totev (totev@anl.gov) on Tuesday, March 22, 2011 at 14:04:30

comments: On December 1, 2010, Westinghouse submitted Revision 18 to the AP1000 DCD.

Has this submittal been approved?

If not when it will be approved. Is it this submittal presents substantial change in reactor design? Is this submittal connected to seismic protection of AP1000 component and plant structures.

Thank you in advance.

Totju Totev

organization: Argonne National Laboratory

address1: 9700 S. Cass Avenue

address2:

city: Argonne

state: IL

zip: 60439

country: USA

phone: (630) 363 2094

RRRR-283

From: LIA08 Hoc
Sent: Thursday, March 24, 2011 11:21 AM
To: LIA02 Hoc; LIA03 Hoc; RST01 Hoc; LIA06 Hoc
Subject: RE: PLEASE PASS TO OPCEN PMT

This request is identified as Task Tracker Record 2536 and is currently assigned to the OST...
Rani

From: LIA02 Hoc
Sent: Thursday, March 24, 2011 10:41 AM
To: LIA03 Hoc; RST01 Hoc; LIA06 Hoc; LIA08 Hoc
Subject: FW: PLEASE PASS TO OPCEN PMT

Do we have any information about decommissioning. Did we do something for Three Mile Island.

From: Scott, Michael
Sent: Thursday, March 24, 2011 10:29 AM
To: LIA02 Hoc
Subject: PLEASE PASS TO OPCEN PMT

This afternoon I conveyed, through the PMT, a request from NISA for information on long-term decommissioning activities for damaged reactors. This is a broad request that will undoubtedly take some time to put together. If NRC could provide an initial response to support a Sunday meeting here with NISA, that would be helpful.

Thanks

RTR/284

Allen, Linda

From: Silva, Patricia
Sent: Thursday, March 17, 2011 11:44 AM
To: Collins, Douglas; DeJesus, Jonathan; Fisher, Christian; Henson, Jay; Jenifer, Phyllis; Marenchin, Thomas; Morey, Dennis; Tripp, Christopher; Whaley, Sheena
Subject: FW: FOR OFFICIAL USE ONLY : 0700 Talking Points Update
Attachments: Talking Points Two Pager. 031711. 0700 EDT.docx

From: Tschiltz, Michael
Sent: Thursday, March 17, 2011 8:23 AM
To: Smith, Brian; Habighorst, Peter; Hiltz, Thomas; Silva, Patricia; Bailey, Marissa; Johnson, Robert; Campbell, Larry
Subject: FOR OFFICIAL USE ONLY : 0700 Talking Points Update

Attached .. please feel free to share with your staff with the precaution that this is OOU.. Also, inquiries from outside the agency should be referred to the Office of Public Affairs.

Thanks, Mike

From: LIA07 Hoc
Sent: Thursday, March 17, 2011 7:27 AM
To: LIA07 Hoc; Borchardt, Bill; Virgilio, Martin; Weber, Michael; Jaczko, Gregory; Pace, Patti; Speiser, Herald; Gibbs, Catina; Leeds, Eric; Haney, Catherine; Sheron, Brian; Johnson, Michael; Walker, Dwight; Flory, Shirley; Ostendorff, William; Svinicki, Kristine; Apostolakis, George; Magwood, William
Subject: 0700 Talking Points Update

Please find attached a 0700 NRC talking points. This update corrects a statement in the 0600 talking points regarding the US State Department's actions for its employees in Japan.

Please let me know if you have any questions or concerns.

Thank you,

-Jim

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

RRR/285

NRC "Talking Points" – Current as of March 17, 2011, 0600 EDT

Reactor Status

- Fukushima Daiichi Units 1 - 6
 - TEPCO is working to restore site power and anticipates restoration to Units 2, 5, and 6 today and Units 1, 3, and 4 tomorrow.

Unit 1

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- As of 2200 JST (0900 EDT) on March 14, it is reported that sea water is being injected with reported stable cooling
- Containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- The spent fuel pool level is unknown
- Radiation levels 150-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate. (Site gate is same for each unit.)
- Core cooling is via the core spray header.

Unit 2

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Reactor Core Isolation Cooling (RCIC) has failed
- Secondary containment: Cut hole in the side of the reactor building superstructure to reduce likelihood of hydrogen gas buildup
- Sea water injection restarted with core cooling reported as not stable
- Primary containment is intact
- Radiation levels 150-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate. (Site gate is same for each unit.)
- The spent fuel pool level is unknown. Some water is available as evidenced by steam emanating from hole.

Unit 3

- Core damage due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Sea water is being injected with reported stable cooling
- Hydrogen explosion from overheated fuel-water reaction has severely damaged reactor building (secondary containment)
- Primary containment described as "functional"
- The spent fuel pool level is possibly drained – some evidence of steam.
- Radiation levels 150-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate. (Site gate is same for each unit.)
- Unit 3 is currently TEPCO's priority (unclear whether reactor or spent fuel pool)
- Water cannon should be onsite soon (as of 0400 EDT)

Unit 4

- Unit was in a refueling outage at the time of the event and core was off loaded to the SFP
- First fire in the reactor building was a small generator lube oil fire. IAEA reports that fire was put out at 2200 EDT, March 14.
- Radiation levels 150-1000 mrem/hour at 1000 EDT on March 16, 2011, at site gate. (Site gate is same for each unit.)
- Second fire began at 1645 EDT, March 15, 2011 in reactor building. Fuel reported to be uncovered.
- Radiation level outside Unit 4 reported to be 30R/hour following second fire.

- High radiation dose rates measured between Units 3 and 4, source is suspected to be the Unit 4 spent fuel pool.
- The spent fuel pool's ability to retain water is in doubt, no steam – likely dry.

Unit 5

- The reactor is defueled.
- IAEA Reports Temperature of pool at 64.5 degrees C at 1500 EDT, March 16, 2011.
- Unit 5 diesel generator is providing power to cool Units 5 and 6 spent fuel pools.

Unit 6

- The reactor is defueled.
- IAEA Reports Temperature of pool at 61.0 degrees C at 1300 EDT, March 16, 2011.
- Power to cool the Unit 6 spent fuel pool is being provided by the Unit 5 diesel generator.

Other Japanese Nuclear Sites:

- Fukushima Daiichi Units 1 - 4: As of 7:15 am on March 15 (Japan), Tepco press release reports reactors in cold shutdown and offsite power available.
- Onagawa Units 1 - 3: shutdown, stable, turbine building basement fire extinguished.
- Kashiwazaki Kariwa Nuclear Power Station (Advanced Reactors): Units 1, 5, 6, 7: normal operation / Units 2 to 4: regular outage
- Rokkasho: all units continue safe operations without malfunctions, impacts from earthquake quickly mitigated (emergency diesel generators used, spilt SFP liquid drained and recovered in liquid waste treatment)

Protective Action Recommendations

- For Fukushima Daiichi site, Japanese national government issued a protective action recommendation that instructed evacuation for local residents within a 20km radius of the site boundary and sheltering in place out to 30km for residents who stayed behind
- Japan has imposed no-fly zone (30km radius, altitude unlimited) over Daiichi plants.
- A RASCAL run at 06:54AM (EDT) on March 16, 2011 for hypothetical combined core based on the following assumptions: Units 2 & 3 each, 33% core melt & no containment; Unit 4, full core offload 100% melt in the Spent Fuel Pool (SFP) with no roof; wind direction from West Northwest blowing out to the ocean. Results: PAG exceeded at 50 miles (80.5 km) with TEDE of 24.0 rem, and CDE thyroid of 130 rem.
- Based upon the degrading situation at the Daiichi plant, the US NRC recommends that Americans within 50 miles of the Daiichi plant to evacuate the area.
- The US State Department has approved voluntary authorized departure of family members at the U.S. Embassy in Tokyo, the U.S. Consulate in Nagoya and the Foreign Service Institute in Yokohama.

Meteorological Conditions:

Forecast meteorological data for the 24 hour period (until 1200 EDT on March 17, 2011) indicates wind headed offshore (from NW).

General Talking Points

- TEPCO and US Forces in Japan (USFJ) are working together to allocate firefighting and heavy equipment capable of pumping seawater from the ocean into containment.
 - TEPCO appears to be supplying water by helicopter and water cannon.
 - A list of additional equipment to provide for accident mitigation has been developed by NRC and provided to USAID.
 - Five portable pumps arrived at the Daiichi facility Thursday (1130 SST) from Yokota Air Force Base. Additional equipment to connect pumps is being coordinated.
- Disaster Assistance Response Team arrived Sunday:

- 11 NRC staff are in Tokyo with the Ambassador and getting information from Japanese officials.
- NRC continues to develop projections of the accident's progression, dose estimates and Q&As, including those addressing the safety of reactors in operation in the US.
- Government of Japan has accepted US offer to conduct aerial/ground monitoring and also requested potassium iodide tablets. DOE Aerial Measurement Teams have completed fly over the Daiichi site. Awaiting results.
- The NRC has been asked to provide recommendations for solutions to the spent fuel pool issues during conference call with NISA and TEPCO.

From: LIA06 Hoc
Sent: Thursday, March 24, 2011 8:57 PM
To: RST01 Hoc
Subject: FW: Ambassador Fujisake call

Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

From: Borchardt, Bill
Sent: Thursday, March 24, 2011 6:28 PM
To: HOO Hoc; Zimmerman, Roy; LIA06 Hoc
Cc: Doane, Margaret; Mamish, Nader
Subject: FW: Ambassador Fujisake call

ET: please provide input to OIP by 8:30.

From: Batkin, Joshua
Sent: Thursday, March 24, 2011 6:18 PM
To: Borchardt, Bill; Doane, Margaret
Cc: Bradford, Anna; Coggins, Angela
Subject: Ambassador Fujisake call

Can you please have your staffs work together to provide more detailed information than he has now for his call tomorrow morning? The Chairman is interested in more detail on the status of the cooperative effort between our team and the Japanese, any challenges or concerns about that coordination, specific requests he should make of the Ambassador, any knowledge you might have about what the Ambassador may ask him, and any other information you think is relevant.

It's at 11 and he'll need it at least 30 minutes in advance to review.

Thank you,
Josh

RRR/286

From:

OST02 HOC

To:

Abrams, Charlotte; Abu-Eid, Bobby; Adams, John; Afshar-Tous, Mugeh; Ahn, Hosung; Alemu, Bezakulu; Alter, Peter; Anderson, Brian; Anderson, James; Arribas-Colon, Maria; Ashkebousi, Nima; Athey, George; Baker, Stephen; Ballam, Nick; Barnhurst, Daniel; Barr, Cynthia; Barss, Dan; Bazian, Samuel; Bensi, Michelle; Bergman, Thomas; Berry, Rollie; Bhachu, Ujagar; Bloom, Steven; Blount, Tom; Boger, Bruce; Bonnette, Cassandra; Borchardt, Bill; Bowers, Anthony; Bowman, Gregory; Boyce, Tom (RES); Brandon, Lou; Brandt, Phillip; Brenner, Eliot; Brock, Kathryn; Brown, Cris; Brown, David; Brown, Eva; Brown, Frederick; Brown, Michael; Bukharin, Oleg; Burnell, Scott; Bush-Goddard, Stephanie; Campbell, Stephen; Camper, Larry; Carpenter, Cynthia; Carter, Mary; Case, Michael; Casto, Greg; Cecere, Bethany; Cervera, Margaret; Chazell, Russell; Chen, Yen-Ju; Cheok, Michael; Chokshi, Nilesh; Chowdhury, Prosanta; Circle, Jeff; Clement, Richard; Clinton, Rebecca; Coggins, Angela; Collins, Frank; Cool, Donald; Correia, Richard; Costa, Arlon; Couret, Ivonne; Crutchley, Mary Glenn; Cruz, Zahir; Cuadrado, Leira; Dacus, Eugene; DeCicco, Joseph; Decker, David; Dembek, Stephen; Devlin, Stephanie; Dimmick, Lisa; Doane, Margaret; Dorman, Dan; Dorsey, Cynthia; Dozier, Jerry; Drake, Margaret; Droogitis, Spiros; Dube, Donald; Dudes, Laura; Eads, Johnny; Emche, Danielle; English, Lance; Erlanger, Craig; Esmaili, Hossein; Figueroa, Roberto; Fiske, Jonathan; Flannery, Cindy; Floyd, Daphene; Foggie, Kirk; Foster, Jack; Fragoyannis, Nancy; Franovich, Rani; Frazier, Alan; Freshman, Steve; Fuller, Edward; Galletta, Thomas; Gambone, Kimberly; Gibson, Kathy; Giltner, Joseph; Gilmer, James; Gordon, Dennis; Gott, William; Grant, Jeffery; Greenwood, Carol; Grimes, Kelly; Grobe, Jack; Gross, Allen; Gulla, Gerald; Hale, Jerry; Hardesty, Duane; Harrington, Holly; Harris, Tim; Hart, Ken; Hart, Michelle; Harvey, Brad; Hasselberg, Rick; Hayden, Elizabeth; Helton, Donald; Henderson, Karen; Hiland, Patrick; Holahan, Patricia; Holahan, Vincent; Holian, Brian; Howard, Tabitha; Huffert, Anthony; Hurd, Sapna; Huyck, Doug; Imboden, Andy; Isom, James; Jackson, Karen; Jacobson, Jeffrey; Jervy, Richard; Jessie, Janelle; Johnson, Michael; Jolicoeur, John; Jones, Andrea; Jones, Cynthia; Jones, Henry; Kahler, Carolyn; Kammerer, Annie; Karas, Rebecca; Kauffman, John; Khan, Omar; Kolb, Timothy; Kotzalas, Margie; Kowalczyk, Jeffrey; Kratchman, Jessica; Kugler, Andrew; Lamb, Christopher; Lane, John; Larson, Emily; Laur, Steven; LaVie, Steve; Lewis, Robert; Li, Yong; Lichtz, Taylor; Lising, Jason; Lombard, Mark; Lubinski, John; Lui, Christiana; Lukes, Kim; Lynch, Jeffery; Ma, John; Mamish, Nader; Manahan, Michelle; Marksberry, Don; Marshall, Jane; Masao, Nagai; Maupin, Cardelia; Mayros, Lauren; Mazaika, Michael; McConnell, Keith; McCoppin, Michael; McDermott, Brian; McGinty, Tim; McGovern, Denise; McIntyre, David; McMurtry, Anthony; Merritt, Christina; Meyer, Karen; Miller, Charles; Miller, Chris; Milligan, Patricia; Miranda, Samuel; Mohseni, Aby; Moore, Scott; Morlang, Gary; Morris, Scott; Mroz (Sahm), Sara; Munson, Clifford; Murray, Charles; Nerret, Amanda; Nguyen, Caroline; Norris, Michael; Norton, Charles; Ordaz, Vonna; Owens, Janice; Padovan, Mark; Parillo, John; Patel, Jay; Patel, Pravin; Patrick, Mark; Perin, Vanice; Pope, Tia; Powell, Amy; Purdy, Gary; Quinlan, Kevin; Raddatz, Michael; Ragland, Robert; Ralph, Melissa; Ramsey, Jack; Reed, Elizabeth; Reed, Sara; Reed, Wendy; Reis, Terrence; Resner, Mark; Riley (OCA), Timothy; Riner, Kelly; Rini, Brett; Robinson, Edward; Rodriguez-Luccioni, Hector; Roggenbrodt, William; Ronon, Kimberly; Rosenberg, Stacey; Ross-Lee, MarvJane; Roundtree, Amy; Ruland, William; Ryan, Michelle; Salay, Michael; Salter, Susan; Salus, Amy; Sanfilippo, Nathan; Scarbrough, Thomas; Schaperow, Jason; Schmidt, Duane; Schmidt, Rebecca; Schoenebeck, Greg; Schrader, Eric; Schwartzman, Jennifer; Seber, Dogan; See, Kenneth; Shane, Raeann; Shea, James; Shepherd, Jill; Sheron, Brian; Skarda, Raymond; Skeen, David; Sloan, Scott; Smiroldo, Elizabeth; Smith, Brooke; Smith, Stacy; Smith, Theodore; Stahl, Eric; Stang, Annette; Steger (Tucci), Christine; Stieve, Alice; Stone, Rebecca; Stransky, Robert; Sturz, Fritz; Sullivan, Randy; Summers, Robert; Sun, Casper; Tappert, John; Tegeler, Bret; Temple, Jeffrey; Thagard, Mark; Thomas, Eric; Thorp, John; Tiruneh, Nebiyu; Tobin, Jennifer; Trefethen, Jean; Tschiltz, Michael; Turtill, Richard; Uhle, Jennifer; Valencia, Sandra; Vaughn, James; Versluis, Robert; Vick, Lawrence; Virgilio, Martin; Virgilio, Rosetta; Ward, Leonard; Ward, William; Wastler, Sandra; Watson, Bruce; Webber, Robert; Weber, Michael; White, Bernard; Wiggins, Jim; Williams, Donna; Williams, Joseph; Williamson, Linda; Willis, Dori; Wimbush, Andrea; Wittick, Brian; Wray, John; Wright, Lisa (Gibney); Wright, Ned; Wunder, George; Young, Francis; Zimmerman, Jacob; Zimmerman, Roy

Subject: Japanese Earthquake ERO Staffing March 18-26, 2011**Date:** Tuesday, March 22, 2011 12:03:30 PM**Attachments:** Staffing Schedule March 18-26 JAPAN EARTHQUAKE - Different Format.docx

Good Afternoon,

Attached is the OPS Center watchbill for March 18-26th, you will be receiving the watchbill for the week of March 26-April 2nd, in the future. If you need to change the schedule, please send an email to OST02 HOC.

RRRR-287

JAPAN EARTHQUAKE - ERO STAFFING SCHEDULE
MARCH 19 - 26

[illegible]

David Decker

From: Schmidt, Rebecca
Sent: Friday, March 11, 2011 1:49 PM
To: Haynes, Laura (Carper)
Cc: Decker, David
Subject: japan info

Laura,

Raeann is in the Ops center and David just came back from a meeting on it. He will call you Becky

RRR-288

From: Harrington, Holly
To: Brenner, Eliot; Burnell, Scott; Couret, Ivonne; Hayden, Elizabeth; McIntyre, David; Chandrathil, Prema; Dricks, Victor; Hannah, Roger; Ledford, Joey; Mitiyng, Viktoria; Screnci, Diane; Sheehan, Neil; Uselding, Lara
Subject: FW: Information on emergency planning in the U.S.
Date: Tuesday, March 22, 2011 11:38:00 AM
Attachments: Information on emergency planning in the US.docx

FYI – might be helpful to folks

From: PMT03 Hoc
Sent: Tuesday, March 22, 2011 10:54 AM
To: Harrington, Holly
Cc: Hoc, PMT12
Subject: Information on emergency planning in the U.S.

Holly:

Per your request to Kathryn Brock (PMT), attached is the subject information. Should you have questions, please contact Kathryn at PMT12.hoc@nrc.gov, or 301-816-5415.

Prosanta Chowdhury
PMT Coordinator
301-816-5407

RRRR-289

Information on emergency planning in the U.S.

- For domestic events, licensees are responsible for making protective action recommendations (PAR) based on plant conditions and/or dose projection, and emergency plans in place. The State then makes a protective action decision (PAD) to either use the licensee's PAR or to make their own decision. NRC monitors the PAR and the PAD.
- Each licensee has their own emergency procedures; however, most start with a 2-mile radius and 5-mile downwind evacuation. Some licensees recommend initial evacuation out to 10 miles, depending on plant conditions. Dose projections requiring PARs beyond 10 miles are provided to the States for PADs beyond 10 miles. Emergency planning zones are meant to be expanded, as necessary, depending on plant conditions. NRC believes this emergency preparedness basis is appropriate.
- In the US, the NRC has access to plant data via the ERDS network and can easily obtain plant data that may be used in RASCAL calculations to make evaluations of realistic protective actions. In addition, NRC has a detailed understanding of plant design for US plants and would not have to make assumptions, as was done for the Japanese plants and spent fuel pools.
- On March 16th the NRC recommended that American residents within 50 miles of the Fukushima reactors in Japan evacuate. This was based on extremely limited data from Japan that was used to develop two dose assessments using RASCAL. As discussed in the press release, this was based on system conditions for a hypothetical single reactor site (source terms were combined) and is not representative of an actual release.
- If these exact conditions occurred in the US, the State would have made a PAD and the NRC would have expected it to be similar to the PAR issued by NRC in this event. However, if this event were in the US, the NRC would have realistic data from the licensee and would not have to rely on hypothetical and overly conservative assumptions.

From: OST01 HOC
Sent: Thursday, April 14, 2011 6:38 PM
To: LIA08 Hoc
Subject: RE: All Team Major Document Status

thanks

From: LIA08 Hoc
Sent: Thursday, April 14, 2011 6:34 PM
To: OST01 HOC
Subject: RE: All Team Major Document Status

No updates from LT, Cynthia.
Rani

From: OST01 HOC
Sent: Thursday, April 14, 2011 5:14 PM
To: Hoc, PMT12; RST01 Hoc; Boger, Bruce; LIA08 Hoc
Subject: All Team Major Document Status

Requested copy of large task list

Attached "All Teams Major Document Status" last updated April 13, 2011

R&R/290

All Teams Major Document Status
Last Updated: April 13, 2011 @ 0600 EDT

Document Title	Purpose	Team	Current Status	Stakeholders Input to Request	Due Date	Action	Other
Priority 1: Compilation of the 3 Documents into 1 Composite Document							
Comprehensive (Global) Assessment Attach Detailed Supporting Documents	Intended use is "Highest Level" document to subsume all others eventually being the NUREG describing agency activities for this event.	NRC Japan Site Team	Comments to Site team on Mid shift (4/10) RST providing some high level summaries to site team			Mike Hay is working. Chuck envisions taking high level bullets to use as briefing material, some for Sec. Clinton visit. This document could be the "source" document for the slide(s).	This document will be used to help support Sec. State Clinton visit on 4/17. Draft slides developed by Japan Site Team for comment.
Composite Analysis for Daiichi regarding EPZ and Stability	Gain agreement internally (US Govt) on the "3-primary (see Action note)" areas. This document allows DOS/ Ambassador to make recommendations to US citizens using a consensus standard. This document is not principally intended for the Japanese	Lead team on Document: PMT Work with RST on document Trish Milligan has the lead to compile the rollup of the talking points for the comprehensive document	PMT and RST are working on creating and refining the composite document. Looking at infrastructure question NR provided a paper they developed. Marty & Dyer had some comments on structure; PMT working document Talking Points Drafted (~0300EDT 4/12)	Site Team EPA Naval Reactors DOE OSTP Consideration to having a "face-to-face"	IPC Status on 4/12 Next Dep. Mtg. TBD.	Take the following 3 documents and create a composite document with a rollup of talking points. <ul style="list-style-type: none"> - Criteria for Relaxing of 50 mile EPZ (PMT) - Grab & Go criteria in 50-mile EPZ (PMT) - Reactor Stable Conditions (Stability Doc) (RST) Comments provided to NR on policy issue of "dose criteria for return"	Substantive input provided by Trish Milligan, EPA, Naval Reactors, PMT, and RST.

All Teams Major Document Status
Last Updated: April 13, 2011 @ 0600 EDT

Document Title	Purpose	Team	Current Status	Stakeholders Input to Request	Due Date	Action	Other
Simplified Plant Condition Stability determination (supports RST Reactor Safety Assessment – Rev. 2- and PMT Composite documents)	This is a document for NISA (at their request) that captures the information that was also used in the PMT composite document above. It provides a simplified description of the conditions for the Containments, reactors, and spent fuel pools that are required for the Fukushima Daiichi units to be considered "stable." This document is "done" when provided to NISA, but its contents will be incorporated in The Revision 2 of the RST Reactor Safety Assessment document and the PMT Composite document.	RST	NR concur (4/10/11)			Provided to the Site team on 4/10, 1830 EDT. Completed a Revision of this document on 4/13/11 and sent it to the Site Team.	NRC Japan team to use this for interface with Japanese government officials. Other countries have also requested copies, and it will be provided to them once it is given to NISA

All Teams Major Document Status
Last Updated: April 13, 2011 @ 0600 EDT

Document Title	Purpose	Team	Current Status	Stakeholders Input to Request	Due Date	Action	Other
Re-entry into Tokyo	This document is not an NRC product. It is intended to provide guidance to the Embassy for allowing US citizens return to Tokyo and surrounding vicinity from a radiological concern perspective.	State Department Document PMT	PMT provided comments on document	PMT comments, Japan Team Comments, State Dept. comments	N/A	Continue to talk to State Department and review any other drafts of this document. To be discussed at next Deputies meeting.	Embassy sent one page recommendation to DOS.
NOTE: Send the final products of Priority 1 to Vince Holahan when completed at PACOM							
Priority 2: Review/Completion of Documents Below							

All Teams Major Document Status
Last Updated: April 13, 2011 @ 0600 EDT

Document Title	Purpose	Team	Current Status	Stakeholders Input to Request	Due Date	Action	Other
Reactor Safety Assessment	To provide the NRC Reactor Safety Team's assessment and recommendations for the Fukushima-Daiichi reactors to the USNRC team in Japan. This document will incorporate the "action" guides for the SFPs also. This document will be incorporated into the Comprehensive (Global) Assessment. This is a living document that will likely be revised as long as there is a site team.	RST	<p>Under revision (Rev 2)</p> <p>NR has some comments to be incorporated</p> <p>Copy in turnover pile</p> <p>Recommend – maybe this document be turned over to one person in the line organization for getting it done and continually instead of shift to shift</p>	All comments are due on Monday, April 11 th ; INPO/GE-H comments have been received by RST	No driving deadline		The RST has circulated at early draft, and a follow-up draft will be distributed on Mids, 4/11/11.

All Teams Major Document Status
Last Updated: April 13, 2011 @ 0600 EDT

Document Title	Purpose	Team	Current Status	Stakeholders Input to Request	Due Date	Action	Other
Overall SFP Assessment Document (<i>General Discussion of the Desired End State of all Spent Fuel Pools</i>)	This document is prepared to gain alignment/agreement among the reviewers/contributors on what actions should be taken to stabilize and maintain the SFP in long-term. This document will be incorporated in the Rx Safety Assessment (Rev.2), which will be incorporated in the Comprehensive (Global) Assessment Document.	RST	Currently RST is incorporating NR comments(4/10 Swings). Incorporating Site Team comments on mids, 4/11/11	Need site team comments and NR has comments		To be eventually incorporated into the Rx Safety Assessment (document above).	

All Teams Major Document Status
Last Updated: April 13, 2011 @ 0600 EDT

Document Title	Purpose	Team	Current Status	Stakeholders Input to Request	Due Date	Action	Other
SFP - Slurry	This document was initiated at the request of the NRC Japan Team to support a briefing by Chuck Casto of the American Ambassador. It is intended to outline the technical issues associated with addition of a "slurry" to the spent fuel pool for Fukushima Daiichi Unit 4 and provide views based on available information.	RST	Issued	Site Team has it for comment, NR does not have for comment			
Option B Paper	The purpose of this paper is to present measures which may be taken by TEPCO in order to maximize the success of their current strategy.	RST	Issued, on 4-10-2011.	Site Team		Provided to the Site Team On 4/10/2011.	

All Teams Major Document Status
Last Updated: April 13, 2011 @ 0600 EDT

Document Title	Purpose	Team	Current Status	Stakeholders Input to Request	Due Date	Action	Other
DOE's Slurry - Presentation	Provides quantitative numerical heat conduction analysis of SFP to support entombment assessment.	DOE	Issued, Sent to the site team, DOE and NRC papers are aligned that this method should be a last resort				Supports NRC document on SFP-Slurry paper.
Plume Modeling with NOAA	Provide source term information to model the dispersion of radioactive materials in the ocean.	PMT	Plausible realistic V3 source term being provided to NOAA with suggested approach to uniformly distribute release in the ocean over 7 days.	NOAA	TBD	Sent to NOAA, awaiting next steps.	
SFP Structural Assessment #4	This document provides comments on TEPCO's assessment of the structural stability of SFP#4. It was prepared by GE and INPO .	RST	GEH input received 4/9			Send to Site Team	
							See discussion on "Global Assessment" document, from which Chuck will select briefing material.

From: [Deahl, Elizabeth](#)
To: [OPA Resource](#)
Cc: [Harrington, Holly](#); [McGowan, Anna](#); [Nichols, Russell](#)
Subject: info resource for Japan events
Date: Tuesday, March 22, 2011 11:23:49 AM

Hello OPA,

I wanted to share another international information resource related to the events in Japan that we have found that might be useful. Apologies if you already are familiar with it.

ReliefWeb, "serving the information needs of the international humanitarian relief community" <http://www.reliefweb.int/rw/dbc.nsf/doc100?OpenForm>

ReliefWeb is your source for timely, reliable and relevant humanitarian information and analysis.

Our goal is to help you make sense of humanitarian crises worldwide. To do this, we scan the websites of international and non-governmental organizations, governments, research institutions and the media for news, reports, press releases, appeals, policy documents, analysis and maps related to humanitarian emergencies worldwide. We then ensure the most relevant content is available on ReliefWeb, or delivered through your preferred channel ([RSS](#), [e-mail](#), mobile phone, [Twitter](#) or [Facebook](#)).

In addition, ReliefWeb produces maps and infographics to illustrate and explain humanitarian crises. To ensure ReliefWeb is updated around the clock, we maintain offices in three different time zones: Kobe (Japan), Geneva (Switzerland) and New York (USA). Wherever you are in the world, you can follow ReliefWeb on Facebook and Twitter, where we highlight important humanitarian issues, post updates on our operations and outline our staff members' professional activities.

We also welcome your submissions via e-mail at submit@reliefweb.int

Latest Updates section for Japan include Updates by Sector, Key Documents, Appeals for Funding, Maps, and Who is Reporting.

Examples are press statements from the Govt of Japan (less than 12 hrs old) with data on Major Plant parameters (Reactor pressure, CV pressure, water level, Spent Pool Pressure, etc.) for each plant; NASA images showing electricity losses in northeastern Japan; detailed maps and fact sheets from USAID.

Please let me know if you have any questions.

Regards,
Beth

Beth Deahl
Technical Information Center Section
Information and Records Services Division
NRC Office of Information Services
elizabeth.deahl@nrc.gov
301.415.5684

RRRR-291

From: [ET02 Hoc](#)
To: [Burnell, Scott; Harrington, Holly](#)
Subject: WebEOC link
Date: Tuesday, March 22, 2011 11:05:08 AM
Attachments: [WebEOC 7.3 Login.url](#)

RRR-292

Attachment WebEOC 7.3 Login.url (236 Bytes) cannot be converted to PDF format.

Ross, Robin

From: Wertz, Trent on behalf of Leeds, Eric
Sent: Thursday, April 14, 2011 11:27 AM
To: Wertz, Trent
Subject: FW: Fukushima Status March 25 18:00
Attachments: 20110325 18-00 personal translation.pdf

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

From: Cullingford, Michael *NRK*
Sent: Friday, March 25, 2011 1:50 PM
To: Nelson, Robert; Thomas, Eric
Cc: Leeds, Eric; McGinty, Tim; Blount, Tom; Regan, Christopher; Astwood, Heather; Hopkins, Jon; Abrams, Charlotte
Subject: FW: Fukushima Status March 25 18:00

fyi

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

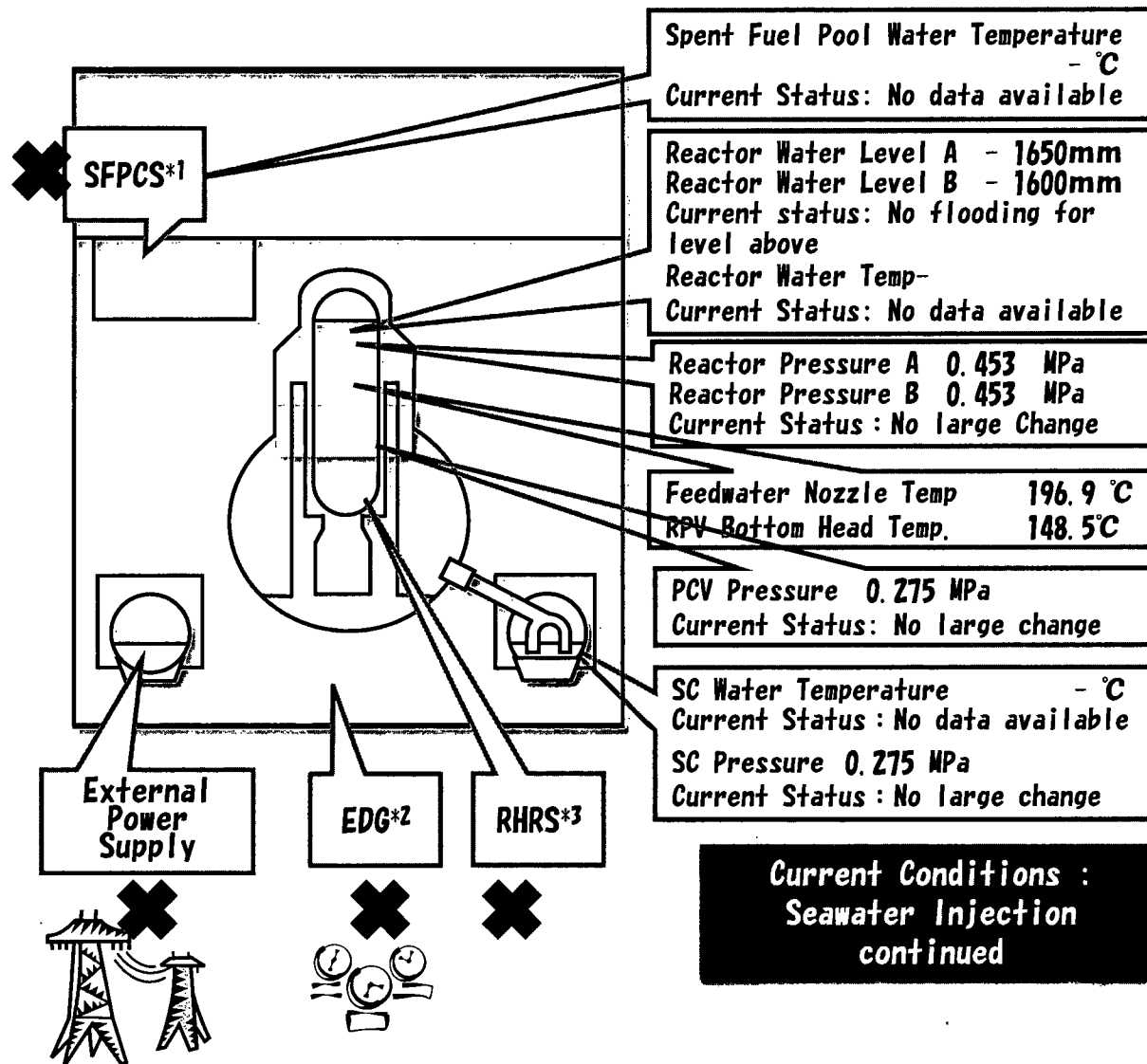
From: 中川air [<mailto:nakagawa@ruby.famille.ne.jp>] *JNES*
Sent: Friday, March 25, 2011 1:07 PM
To: 中川; Foggie, Kirk; marie-pierre.comets@asn.fr
Subject: Fukushima Status March 25 18:00

For your information

- 1) Basically general situation seems settled down though we cannot still be optimistic.
- 2) Unfortunately personnel exposure will be increased because the repair work started to be active. As was reported, three TEPCO workers were exposed.
- 3) Environmental data started to show unfavorable data but this is due to the start of monitoring after long time from the accident and expansion of the monitoring areas. On the same spots readings show lower values.

Nakagawa
JNES

Current Status of Fukushima Dai-ichi Nuclear Power Stations Unit 1 (As of 18:00 March 25th, 2011)

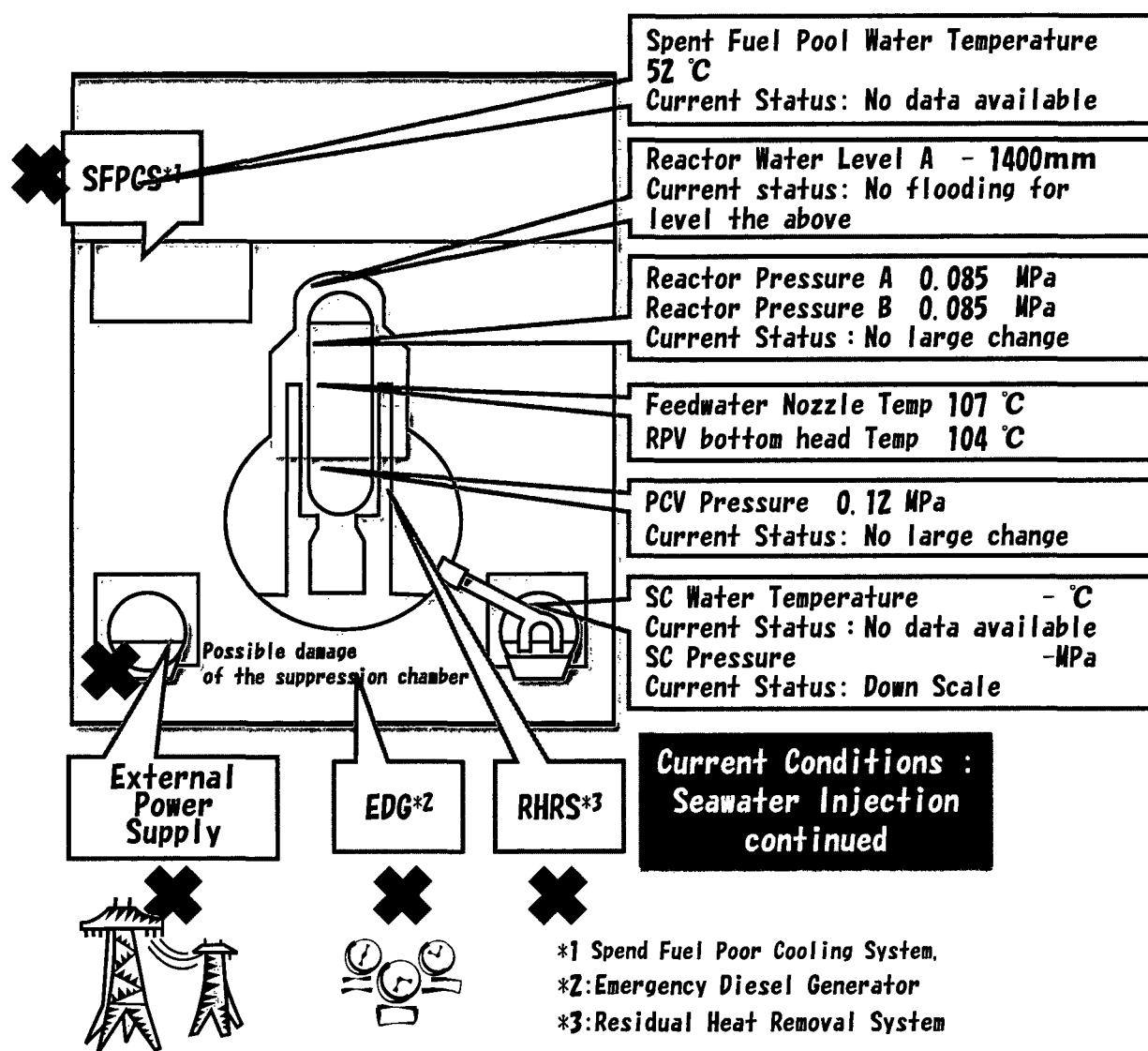


Major Events after the earthquake

- 11th 14:46 : Under operation, Automatic Shutdown by the earthquake
- 11th 15:42 : Report of the Article 10 event (Loss of all A/C Power)
- 11th 16:36: Occurrence of the Article 15 event (Loss of water injection from ECCS)
- 12th 0:49 Occurrence of the Article 15 event (Unusual increase of PCV pressure)
- 12th 14:30 Start to vent
- 12th 15:36 Sound of explosion
- 12th 20:20 Start of injection of seawater and borated water to the core
- 23rd 02:33 Additional water injection by water injection line other than Fire Extinguish Line ((2m³/h → 18m³/h))
- 24th 11:30 Recovery of lightning in the Main Control Room
- 25th Start Injection of fresh Water

PERSONAL TRANSLATION

Current Status of Fukushima Dai-ichi Nuclear Power Stations Unit 2 (As of 18:00 March 25th, 2011)

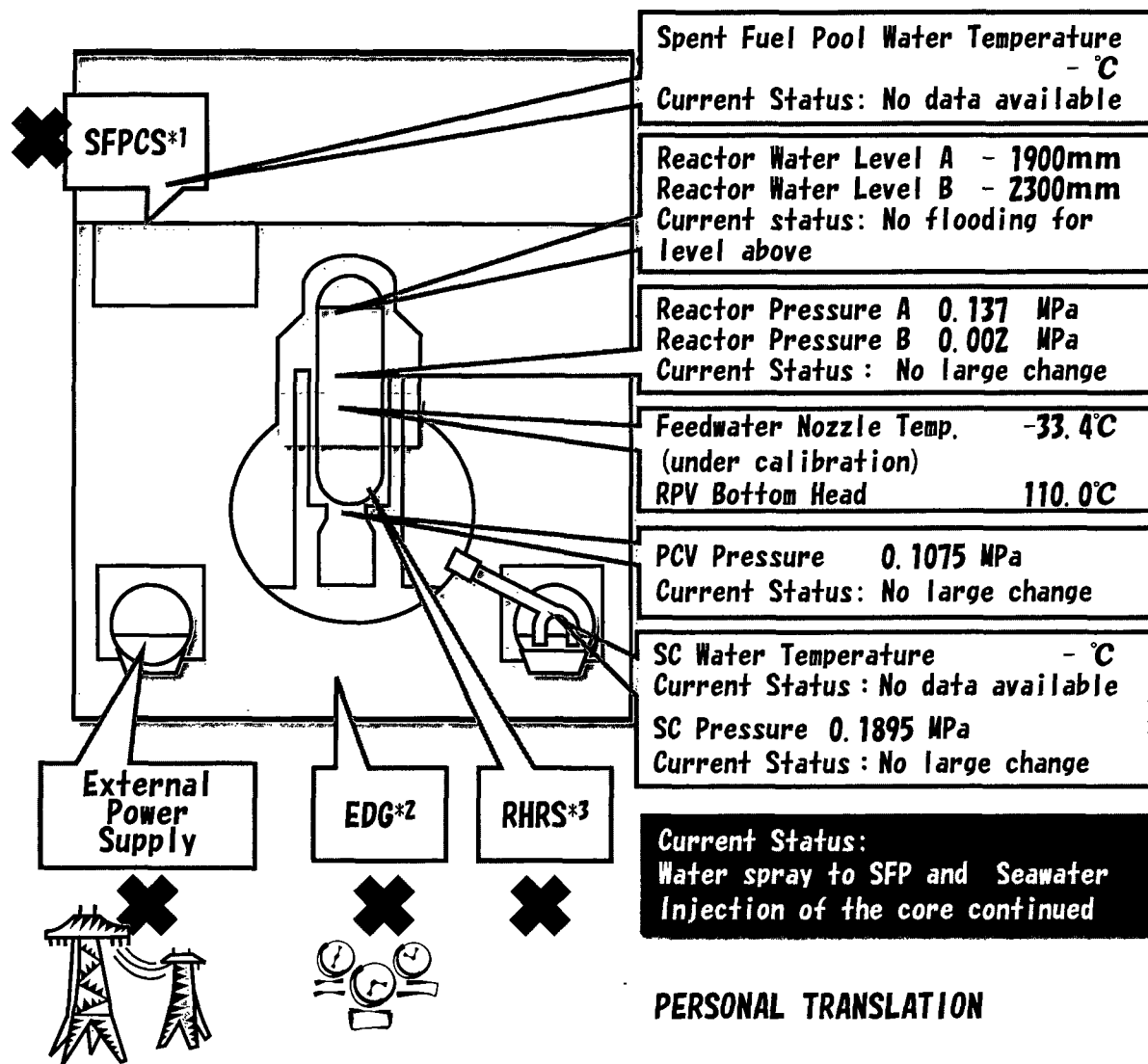


Major Events after the earthquake

11th 14:46 Under operation, Automatic Shutdown by the Earthquake
11th 15:42 Report of the Article 10 event (loss of A/C power)
11th 16:36 Occurrence of the Article 15 event (Loss of water injection function)
14th 13:25 Occurrence of the Article 15 event (Loss of water cooling function) 14th 22:50 Occurrence of the Article 15 event (unusual increase of PCV pressure) 15th 6:10 Sound of explosion
15th about 6:20 Possible damage of the suppression chamber
20th 15:05-17:20 40ton seawater injected to SFP from Fuel Pool Cooling System
20th 15:46 Receiving external power supply at Power Center
21st 18:22 White smoke observed and then faded invisible
22nd 16:07 18 ton seawater injected to SFP
25th 10:30-12:19 Seawater injection to SFP from SFPCS

PERSONAL TRANSLATION

Current Status of Fukushima Dai-ichi Nuclear Power Stations Unit 3 (As of 18:00 March 25th, 2011)

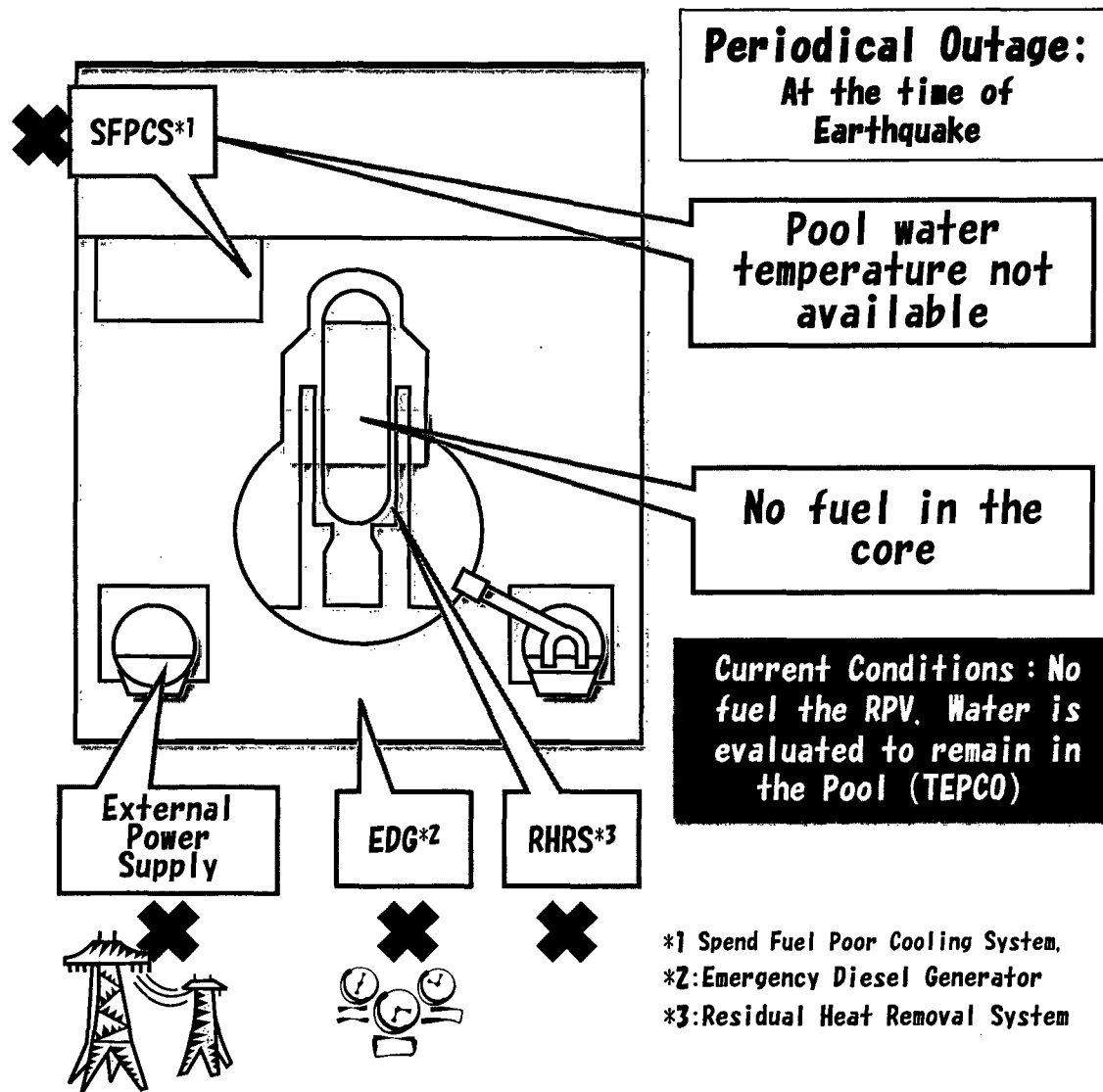


Major Events after the earthquake

11th 14:46 Automatic shutdown by the earthquake
11th 15:42 Report on the Article 10 event (Loss of A/C power)
13th 5:10 Report on the Article 15 event (Loss of water injection function)
13th 8:10 Start to bent
14th 7:44 Occurrence of the Article 15 event (unusual increase of PCV pressure)
11:01 Sound of explosion
16th about 8:30 White smoke observed
17th 9:48~10:01 Water discharge by the helicopters of Self-Defense Force (4 times)
19:05~20:09 Water spray by High pressure water-cannon trucks (Police: 1 time, Self-Defense Force: 5 times)
18th around 14:00~14:38 Water spray by 6 fire engine (Self-Defense Force: 6 times)
14:45 Water spray (US fire engine: 1 time)
19th 0:00~01:00
14:10~20th 03:40 Water spray (Tokyo Fire Department)
20th 11:00 Increase of PCV pressure (320kPa) and decrease
20th 20:39~21th 03:58 Water spray (Tokyo Fire Department)
21st 15:55 Black smoke observed, 17:55 disappeared
22nd 15:10~16:00 Hyper Rescue of Tokyo and Osaka
22nd 22:43 Recovery of Lightning in MCR
23rd 11:03 13:20 Seawater Injection to SFP from SFPCS
23rd 16:20 Black smoke observed, 23:30 and 24th 04:40 disappeared
24th 05:35~16:05 120 ton seawater to SFP
25th 13:28~16:00 Water spray by Kawasaki Fire Agency
25th 18:02 Start Injecting fresh water to the core

PERSONAL TRANSLATION

Current Status of Fukushima Dai-ichi Nuclear Power Stations Unit 4 (As of 18:00 March 25th, 2011)



Major events after the earthquake

Plant under periodical outage at the time of earthquake

11st 15:42 Report on the Article 10 (Loss of all AC Power)

14th 04:08 Water temperature in the Spent Fuel Pool, 84°C

15th 6:14 Damage of wall in the 4th floor observed

15th 9:38 Fire occurred in the 3rd floor (12:25 extinguished)

16th 5:45 Fire occurred, TEPCO couldn't confirm any fire on site. (06:15)

20th 09:43 Spray to SFP by Self Defense Force

20th 18:30-19:46 Spray to SFP by Self Defense Force

21st 06:37-08:41 Spray to SFP by Self Defense Force

21st 15:00 Cable installation to Power Center completed

22nd 10:35 Connected to Power Center

22nd 17:17-20:32 Spray by Concrete injection Truck

23rd 10:00-13:02 ditto

24th 14:36-17:30 ditto

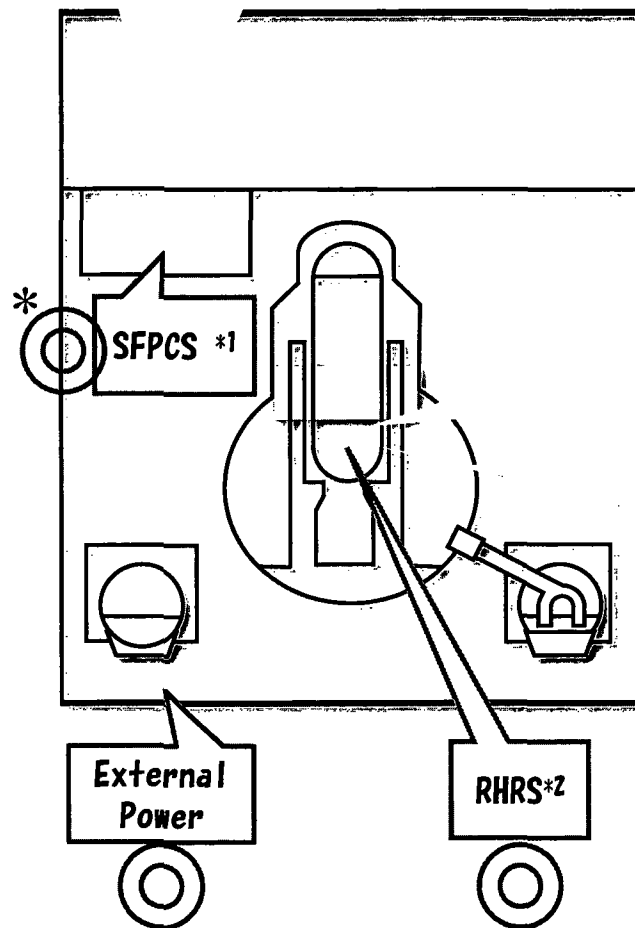
25th 06:05-10:20 Seawater Injection to SFP from SFPCS

25th 18:00 Spray by Concrete Pump Truck

PERSONAL TRANSLATION

Current Status of Fukushima Dai-ichi Nuclear Power Stations Unit 5 (As of 18:00 March 25th, 2011)

Water Temperature in SFP : 37.9 °C
Current Status: Recovery of SFPCS #1



Periodical Outage: At the time of Earthquake

Reactor Pressure :
0.108MPa
Reactor Water Level :
2.288mm
Reactor Water
Temperature :
43.2°C
Current Status: Pressure
etc. under control

PRV Temp. : Monitored by
RPV water

*1: Spent Fuel Pool Cooling
System

*2: Residual Heat Removal System

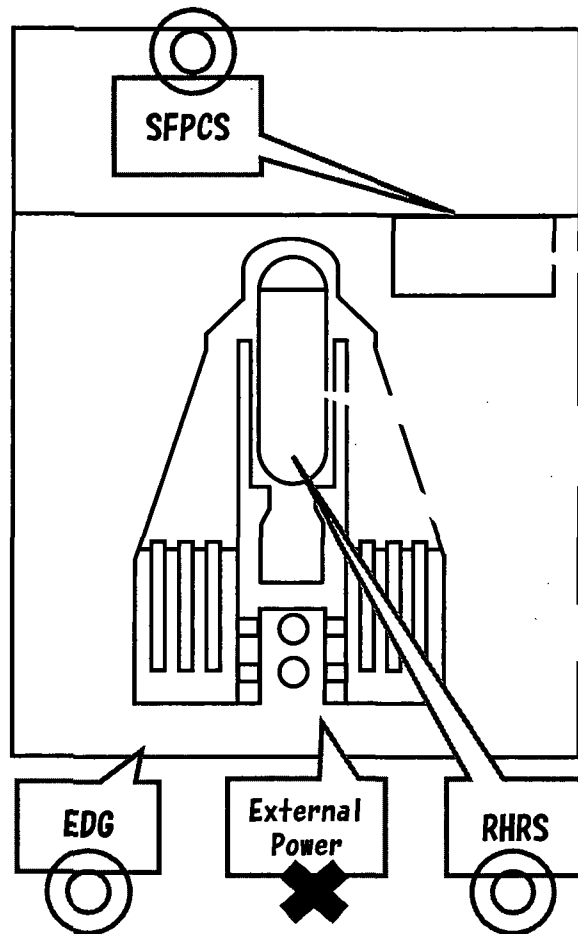
Current Status :

20th 14:30 cold shutdown
21st 11:36 Start receiving
electricity from external
power supply
23rd 17:24 PHR pump
automatically stopped when
switched to permanent power
supply
24th 16:14 Repair of RHR
pump completed
24th 16:35 Start cooling

PERSONAL TRANSLATION

Conditions of Fukushima Dai-ichi Nuclear Power Stations

Unit 6 (As of 18:00 March 25th, 2011)



Periodical Outage:
At the time of Earthquake

Pool Water : 37.9 °C
Current Status : Recovery of
heat removal established

Reactor Pressure : 0.108 MPa
Reactor Water Level : 2.288m
Reactor Water Temp : 43.2°C
Current Status : Pressure
under control

PRV Temp. : Monitored by
RPV water

Current Status :
20th 19:27 cold shutdown
22nd 19:52 Start receiving
electricity at startup
transformer

- *1 Spend Fuel Poor Cooling System,
- *2:Emergency Diesel Generator
- *3:Residual Heat Removal System

PERSONAL TRANSLATION

Arndt, Steven

From: Arndt, Steven
Sent: Tuesday, March 29, 2011 9:28 AM
To: Tinkler, Charles; Marksberry, Don; Schaperow, Jason
Subject: FW: Presentation from Japan Nuclear Technology Institute to NRR today
Attachments: 石川先生寄稿 (電気新聞 英文) .doc; Accident at Fukushima Daiichi (その 1) rev.2 2011.3.24.ppt; Accident at Fukushima Daiichi (その 2) rev.2 2011.3.24.ppt

FYI, in case you have not seen these yet.

Steven

From: Hiland, Patrick
Sent: Tuesday, March 29, 2011 9:19 AM
To: NRR_DE Distribution
Subject: FW: Presentation from Japan Nuclear Technology Institute to NRR today

fyi

From: Brown, Frederick
Sent: Friday, March 25, 2011 5:11 PM
To: RST01 Hoc
Cc: Ruland, William; Skeen, David; Hiland, Patrick; Case, Michael; Dudes, Laura; Uhle, Jennifer; Holian, Brian; Hoc, PMT12
Subject: Presentation from Japan Nuclear Technology Institute to NRR today

RST coordinator – please have these files added to the RST chronology for preservation. PMT may be interested in the second power point presentation.

There are some movies that are too large to e-mail, I'll try to figure out how to transfer them (currently on NRR G: drive in folder "Temp").

They note a large U-3 PV/RCS pressure spike on 3/13 and a primary containment pressure spike on 3/14.

They said that U-1 (none of the units) had a concrete roof – our understanding of the rubble on U-1 is apparently incorrect.

They said that TEPCO does not normally use a checkerboard fuel arrangement for the hot fuel in the pool.

U-1 thru 4 EDGs and switch gear located in ocean side of turbine building in rooms below grade. Totally flooded. The Unit 6 EDG that continued to operate is an air cooled unit. They do not know if the Rx Buildings had any actual flooding.

My impression is that they relied on elevation for flood control (no discussion of water-tight boundaries).

The SW pumps were apparently exposed (tsunami was estimated at 14 meters, with a design basis of 10)

U-1 did have an isolation condenser and no RCIC, the other units did have RCIC. Batteries for RCIC lasted 10 hours.

They believe U-4 explosion from H2, and they have a heat-up "plot" for the SFP showing saturation temperature in less than 2 days from loss of power. They also believe that some reflood would have occurred

to refueling gate damage. That said, with this heat-up curve, that water would not have lasted long either? They believe that picture 2-17 shows a flooded pool after the explosion.

They were equivocal on the containment vent path used and the "hardened" nature of the vent. The stack is where the venting should have occurred, but they understand that something does not make sense.

They had B5b-like connections that they used for the temporary fire pump tie-in to the primary systems.

Published on Mar.18.2011 : The Denki shinbun(The Electric Daily News))

Dr. Michio Ishikawa
Chief Adviser (Former President & CEO)
Japan Nuclear Technology Institute(JANTI)

Estimation of "Status of reactor cores at Fukushima"

This is my emergency estimation about what could be happening at reactor cores at Fukushima, what could happen next and what actions can be taken, based on the facts and developments at the time of the Three Mile Island nuclear accident.

Please bear in mind that I live in the quake-affected city of Hitachinaka. Three whole days of power blackouts up until March 14 left me incommunicado with the outside world. The only source of information was radio broadcast. I had no idea what was happening in the world until the television came on finally in the evening of March 14. Hence, I am a little short on facts and figures. This article describes a scenario that I have put together based on limited facts. Please excuse me for any minor mistakes.

First of all, the state of reactor cores. Knowledge from the TMI accident indicates that reactor cores behave very differently depending on whether they are under or above the water level. This is a relevant point for Fukushima, so let me go into more detail.

The submerged part of the fuel rods is cooled with water, and can maintain a sound state. There is no argument on this point.

On the other hand, the exposed part of the fuel rods is surrounded by steam, and in a poor condition for heat removal. With the temperature increasing gradually with decay heat, the fuel rods begin reacting with steam at around 900 degrees Celsius, oxidizing claddings. This reaction generates strong heat, causing a localized increase of temperature in the immediate area. At around 1300 degrees Celsius, the reaction becomes more active, and the temperature rise on the claddings becomes unstoppable. The claddings become coated with thin oxide film (zirconium dioxide) on the outside, as well as on the inside due to oxygen removal from fuel pellets (uranium dioxide).

In other words, thin oxide film coats the claddings, made of zircaloy, both inside and out. It should be noted that the oxide film has a higher fusing point than the

cladding material, zircaloy, whose fusing point is approx. 1800 degrees Celsius. When zircaloy melts, it drips down between the films to form a puddle. The oxide films on both sides become fused together and pressed onto fuel pellets with the pressure of the reactor. At this stage, a fuel rod can be likened to fuel pellets wrapped in cling wrap. Oxide film is resilient at high temperature, and seals in radiation even with some disfigurement to the fuel rods, keeping them upright in water. This is why no radiation was released from exposed fuel rods at Fukushima. It was no case of measurement error.

This condition changes at the moment when water is added to the core. Oxide film becomes weaker as the temperature drops, and shrinks when cooled down. Fuel rods disintegrate into individual fuel pellets and collapse (not melting), scattering in the reactor water as if a toy box is tipped over. They can stay scattered in water because the submerged part of fuel rods is still sound. This is what happened at the reactor core in the TMI accident.

Collapsed fuel rods are cooled as long as they are submerged in water, thanks to the cooling effect of water flowing through the debris (communication path). Consequently, fuel pellets stay in the state of debris without melting.

Summing up, the exposed top part of fuel rods generated hydrogen and collapsed, but the debris was kept cool, retaining the pellets' radiation containing effect.

The problem lied with the submerged part of the fuel. Water turns into steam as it cools fuel rods. However, in this case, the flow of steam was blocked with the debris, and could not escape, forming a steam zone immediately below the debris. This created a condition similar to the exposed fuel above water. Under water, heat dissipation performance was substantially worse. Heat from cladding oxidization built up and melted fuel rods, initiating meltdown. However, the meltdown temperature was believed to be around 2300 degrees Celsius, which was the fusing point of the ternary alloy of uranium, zirconium and oxygen, rather than the uranium dioxide's fusing point of 2800 degrees Celsius. This meltdown temperature was not high enough to melt concrete, and therefore could not cause a "China Syndrome" scenario.

Since the underside of the meltdown was touching cooling water, it turned into a hard crust state, much like cast iron. Yet, immediately above that, melted fuel flowed in the side direction, came in contact with the core shroud, made of thin stainless steel, and put holes through it. Fuel that dripped from the holes formed balls measuring 15–20 centimeters in diameter, which were later found at the

bottom of the reactor core.

This is how the core meltdown occurred at TMI. The Fukushima plants are showing similar core behaviors. One of the similarities is the fact that the top 2 meters of fuel rods have become exposed above the reactor water for an extended period of time. Cesium and other fission products were released as a result of fuel rods disintegrating upon the injection of seawater. The formation of hydrogen led to explosions, as has widely been reported. The reactor core at TMI was cooled and stabilized after one week. Fukushima will also be successfully brought under control.

The difference between TMI and Fukushima is the existence of a steam-water separator at the top part of the reactor core, because Fukushima uses the BWR system. This structure serves as resistance to releasing steam from the core to the top part of the pressure vessel. It therefore keeps steam in the core, undermining the injection of seawater. Compared to the example of TMI, BWR has a design that may make it difficult to cool the molten core.

Another difference is the use of channel box in nuclear fuel. This could turn out to be a positive or a negative. Yet, it is not a deciding factor, considering that the core has a similar meltdown behavior. In this article, I assume that the positive offsets the negative.

One more major difference is the fact that TMI's reactor core was stabilized with the use of the primary coolant pump (equivalent to the recirculation pump at Fukushima). With PWR, the primary cooling system is clearly separated and insulated from the turbine system. A turbine condenser, which has a high cooling capacity, would never suffer radiation contamination with the activation of a primary coolant pump. This powerful cooling ability successfully halted the meltdown and stabilized the core.

However, with BWR, simply activating a recirculation pump would do no more than agitating the reactor water unless a condenser is also used. The pump alone does not contribute to lowering the core temperature. However, using the condenser runs the risk of sending highly contaminated reactor cooling water to the turbine building, which has only limited shielding facilities. Whether the authorities can make this decision marks a turning point in the on-going efforts to bring the reactors to stability.

The three functions of nuclear safety are to "shut down", "cool down" and "contain". This also represents the order of importance in these safety actions. At Fukushima, all reactors shut down. The next step is to cool them down. For this

purpose, motor power to send water is needed more than anything else. The installation of temporary power source is the task of utmost urgency.

Let me move on to the issue of hydrogen explosions. Such an explosion also rocked the TMI accident. A massive explosion occurred in the containment vessel some ten hours after the accident started. The amount of hydrogen involved in the explosion, according to the post-accident calculation, was equivalent to the amount generated if about half of the fuel claddings became oxidized. This corresponds to the case at Fukushima Daiichi Unit-1 and Unit-3, where fuel rod exposure was reported to be about 50%. In the case of TMI, there was no damage to the containment vessel. In Fukushima, explosions occurred outside the containment vessels, destroying reactor buildings.

In the TMI accident, approx. 1,000 area residents became exposed to radiation at the rate of up to 100 mrem (1 mSv), and 1 mrem (0.01 mSv) on average. The level of radiation when the ventilation operation was conducted to depressurize the containment vessel, was reported to be approx. 1.2 rem (12 mSv) in the skies above the station site, which is similar to the level recorded at the time of ventilation at Fukushima. The radiation dose recorded in the skies above Fukushima Daiichi Unit-4, is said to be 400 mSv. This is because of the loss of water in the spent fuel storage pool, and is set to decrease once the water level is restored. It is still not impossible to keep radiation leak to a minimum in Fukushima, just as in the case with TMI.

Slightly off the topic, there are some people who call the Fukushima case as another Chernobyl. It is unclear what their arguments are. As far as radiation emergency is concerned, there is no possibility that the Fukushima case could cause contamination of the international scale experienced at Chernobyl. This is because of the absence of a graphite fire, which sent radiation high into the air to reach the jet stream. In addition, the low temperature of cooling water means only the radioactive materials with a low boiling point, such as noble gas and iodine, could be released into the atmosphere. The situation is nothing like what happened at Chernobyl.

This summarizes my estimation of the state of accident at Fukushima Daiichi Nuclear Power Station's Units-1-3. I have nothing but respect for all the personnel who continue to fight the desperate fight to bring the plant under control and alleviate the extent of the emergency under the current condition with all power sources swept away in the Tsunami. It is regrettable that the situation has escalated to explosions and damage of reactor buildings. Another task still

remains to stabilize the reactors. I wish to send my support for those people on the frontline. Situations change in emergencies like this every minute. I am prepared to provide as much cooperation as possible despite my old age.

(wrote on Mar.15.2011)

What happened in the TEPCO Fukushima Daiichi Nuclear Power Station

March 24, 2011

Japan Nuclear Technology Institute



Program

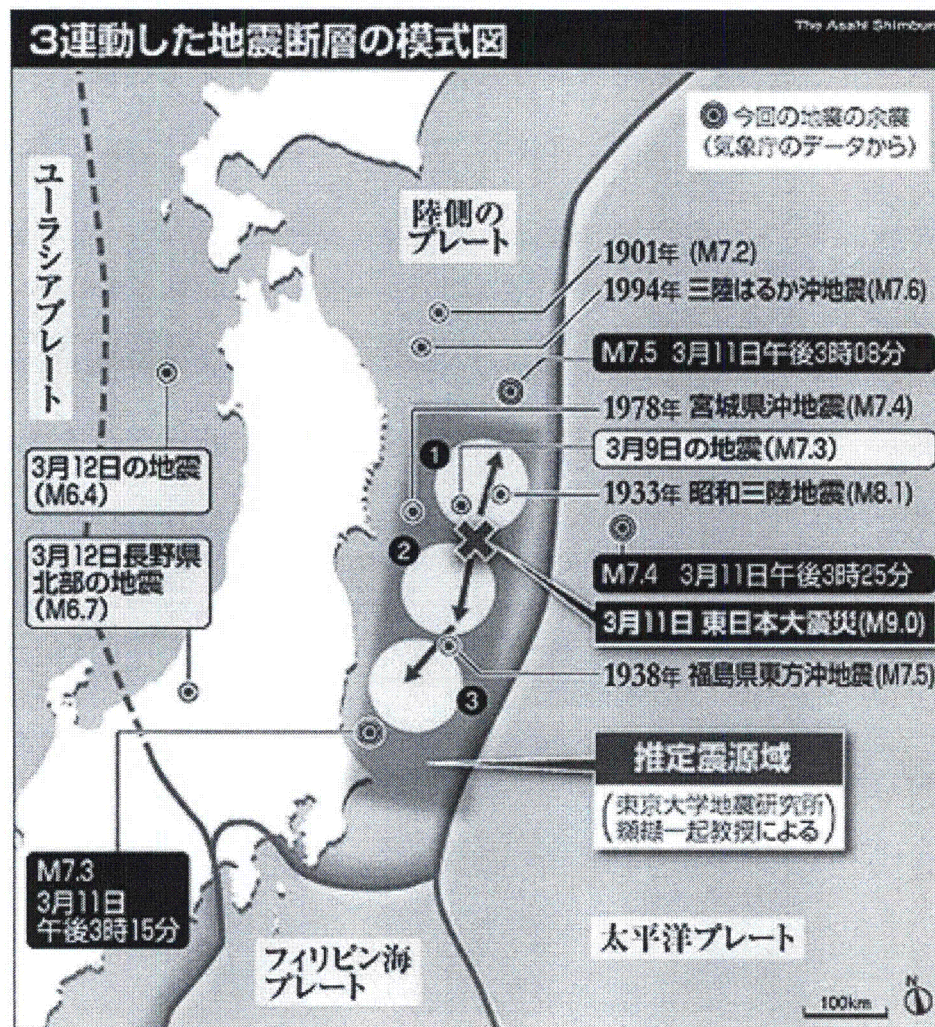
- 0. Opening Remark : 15 min.
- 1. 2011 Tohoku-Pacific Ocean Earthquake and Tsunami : 20 min.
- 2. Current Status of Fukushima Daiichi Nuclear Power Station: 50 min.
- 3. Core Damage Estimation : 20 min.
- 4. Spent Fuel Damage Estimation about Unit-4 SFP : 20 min.
- 5. Radiation Exposure and Monitoring Data : 20 min.
- 6. Discussion : 30 min.



1. 2011 Tohoku-Pacific Ocean Earthquake and Tsunami



2011 Tohoku - Pacific Ocean Earthquake



Asahi Shinbun (14/03/2011)

Magnitude 9.0

Date Friday, March, 11, 2011

Time 02:46 PM at epicenter

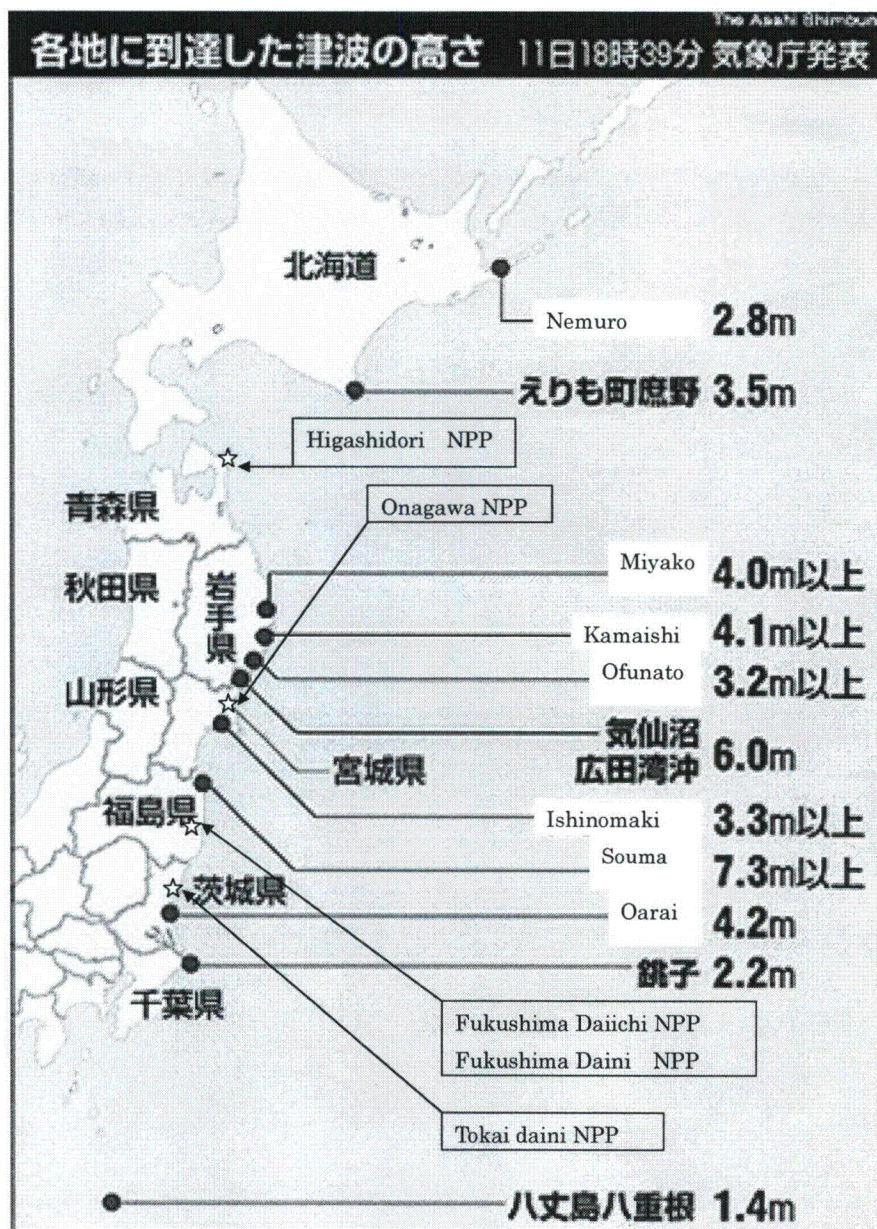
Location 38.3° N, 142.4° E

Depth 24Km

Maximum Intensity 7

(Kurihara City, Miyagi)

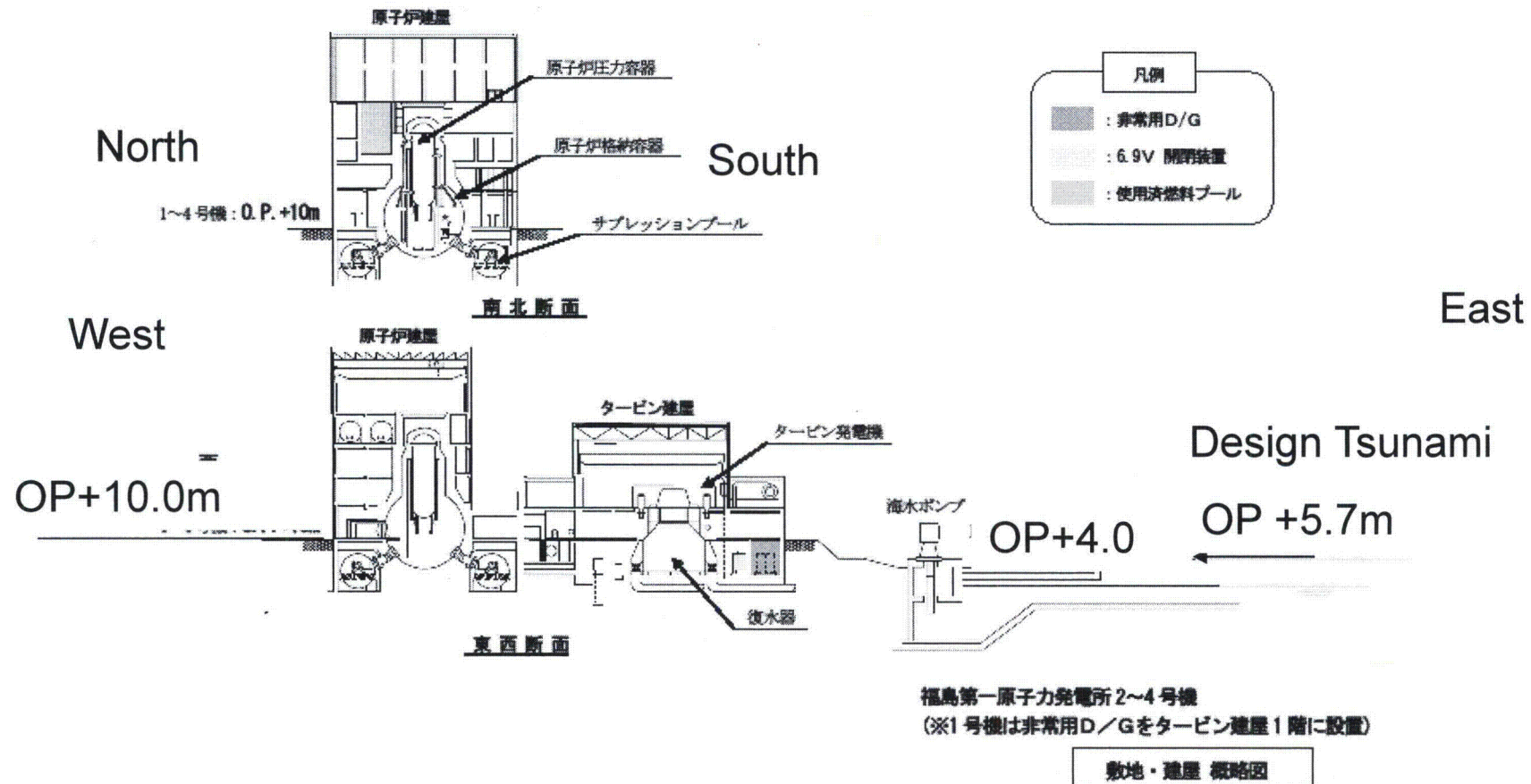




Asahi Shinbun (14/03/2011)に加筆



Fukushima Daiichi Nuclear Power Plants (schematic drawing)



2. Current Status of Fukushima Daiichi Nuclear Power Station

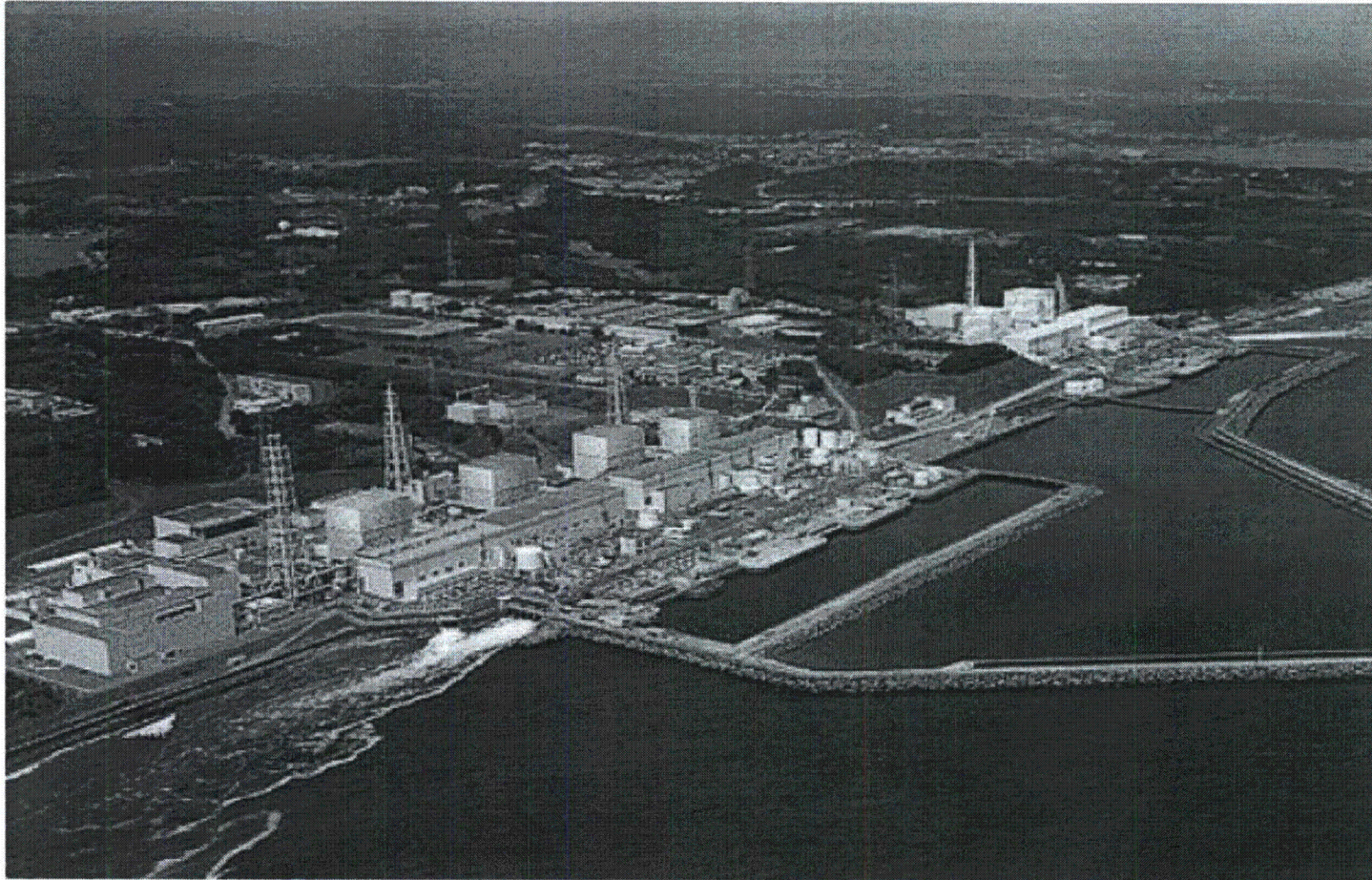


Status of NPPs

Power Station	Unit	MWe	Condition
HigashiDori	1	1,100	Refuel Outage
Onagawa	1	524	Operating→ Scram→ Cold Shutdown
	2	825	Reactor Start→ Scram→ Cold Shutdown
	3	825	Operating→ Scram→ Cold Shutdown
Fukushima Daiichi	1	460	<i>Operating→ Scram→ Damaged</i>
	2	784	<i>Operating→ Scram→ Damaged</i>
	3	784	<i>Operating→ Scram→ Damaged</i>
	4	784	Refuel Outage → <i>Spent Fuel Damaged</i>
	5	784	Refuel Outage → Cold Shutdown
	6	1,100	Refuel Outage → Cold Shutdown
Fukushima Daini	1	1,100	Operating→ Scram→ Cold Shutdown
	2	1,100	Operating→ Scram→ Cold Shutdown
	3	1,100	Operating→ Scram→ Cold Shutdown
	4	1,100	Operating→ Scram→ Cold Shutdown
Tokai Daini	—	1,100	Operating→ Scram→ Cold Shutdown



Overview of Fukushima Daiichi Nuclear Power Station



Summary of Fukushima Daiichi NPPs

Unit	1	2	3	4	5	6
Type	BWR-3	BWR-4	BWR-4	BWR-4	BWR-4	BWR-5
PCV Model	Mark-1	Mark-1	Mark-1	Mark-1	Mark-1	Mark-2
Electric Output (MWe)	460	784	784	784	784	1100
Commercial Operation	Mar. 1971	Jul. 1974	Mar. 1976	Oct. 1978	Apr. 1978	Oct. 1979
Emergency DG	2	2	2	2	2	3
Electric Grid	275kV × 4				500kV × 2	
Plant Status on 11 th Mar.	In Operation	In Operation	In Operation	Refueling Outage	Refueling Outage	Refueling Outage



Fukushima Daiichi Unit-1

(BWR-3, Mark-1, 460Mwe, in Operation)

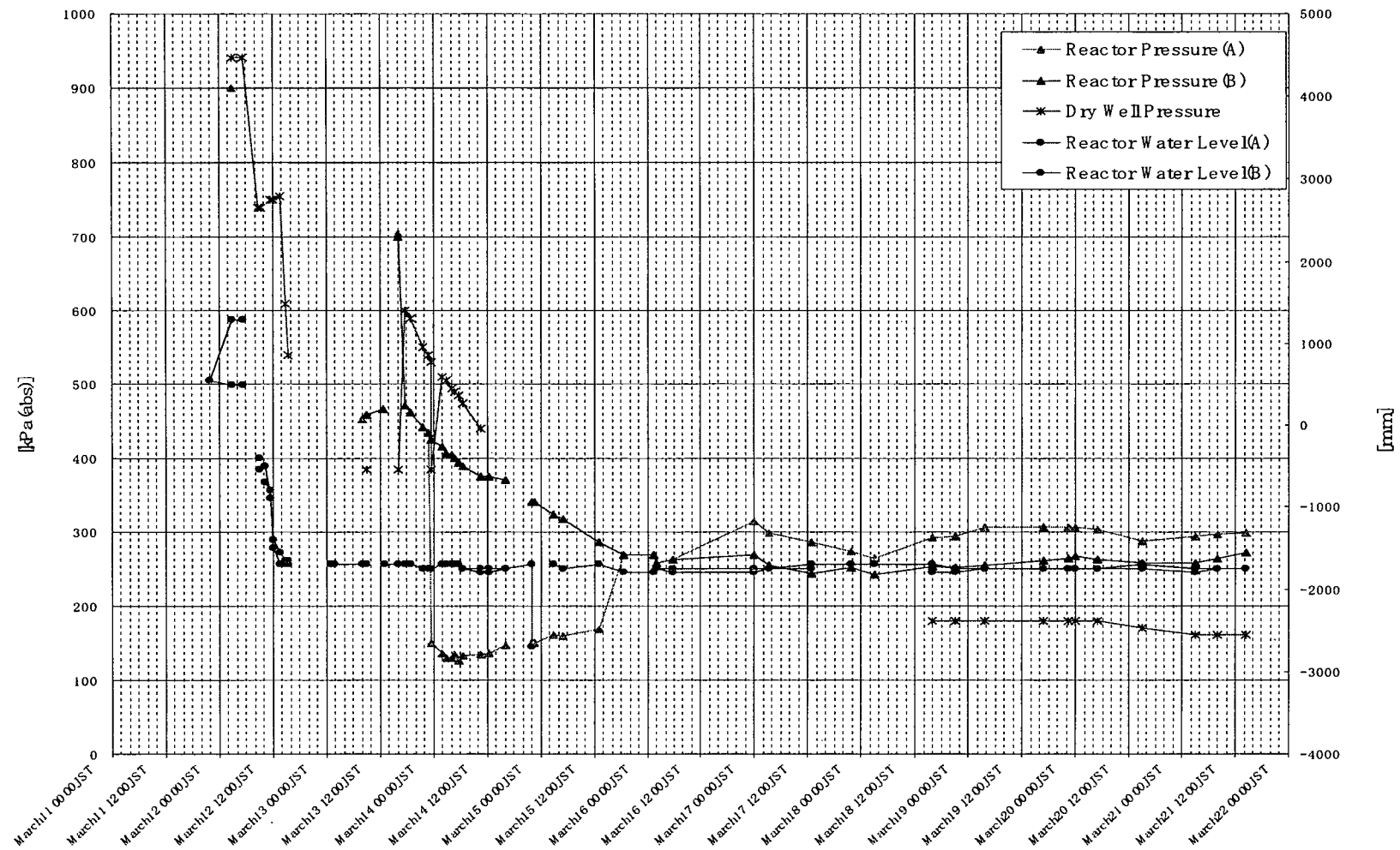
- March 11 • Automatic scram due to the Earthquake
- Loss of offsite power
 - **2 Emergency DGs became inoperable by Tsunami**
 - Rx Core was being cooled by Isolation Condenser
 - Rx water level down
- March 12 • PCV vent
- **A hydrogen explosion** occurred at Rx Building
 - Seawater injection to Rx core was started

[Current Status, as of March 23]

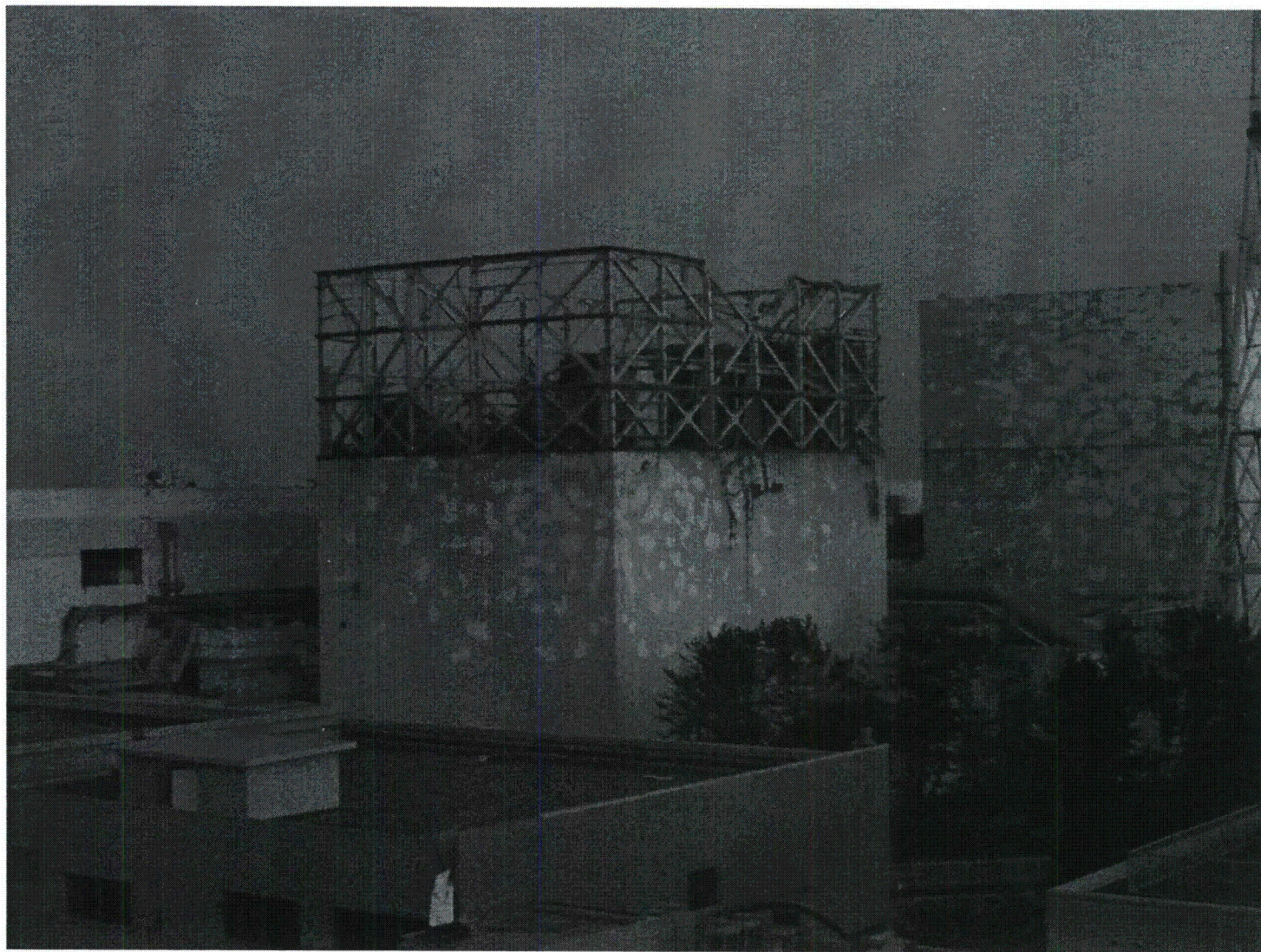
- Rx Water Level : TAF-1,750 mm, -1700 mm
- Rx Pressure : 0.38 MpaG, 0.358 MpaG
- PCV Pressure : 0.36 Mpaabs



Unit-1 Plant Parameters



Rx Building of Unit 1 (March 12)



Fukushima Daiichi Unit-2 (BWR-4, Mark-1, 784Mwe, in Operation)

- March 11 • Automatic scram due to the Earthquake
- Loss of offsite power
 - **2 Emergency DGs became inoperable by Tsunami**
 - Rx Core was being cooled by RCIC
- March 14 • Blowout Panel of Rx Building was opened
- Loss of Rx cooling function
 - Rx water level down
- March 15 • PCV vent
- **A sound of explosion was heard around Supression Chamber**
 - Seawater injection to Rx core
 - White smoke (steam) was first observed
- March 20 • Water spray to Spent Fuel Pool was started



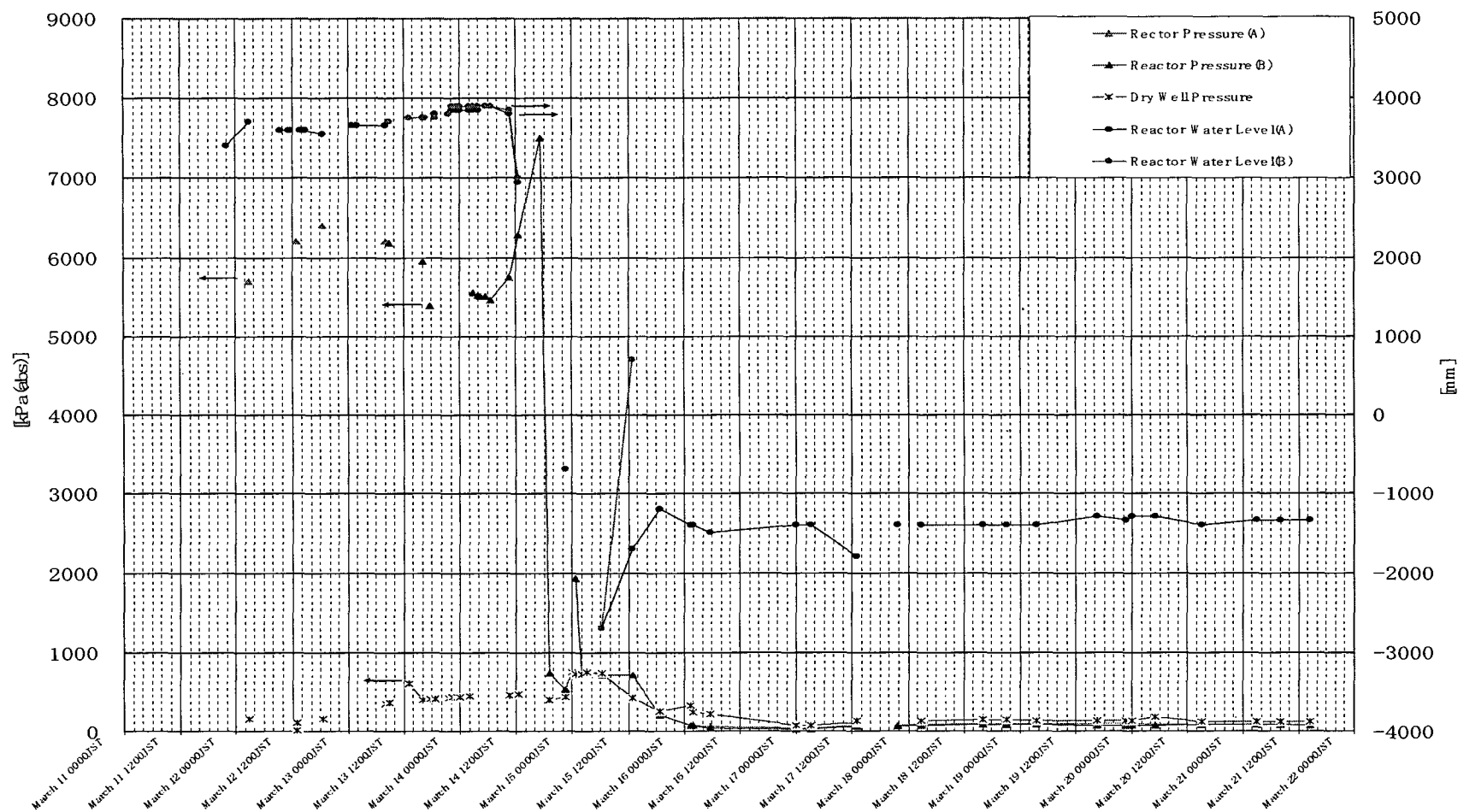
Fukushima Daiichi Unit-2 (BWR-4, Mark-1, 784Mwe, in Operation)

[Current Status, as of March 23]

- Rx Water Level : TAF-1,250 mm
- Rx Pressure : -0.036 MpaG
- PCV Pressure : 0.11 Mpaabs



Unit-2 Plant Parameters



Fukushima Daiichi Unit-3 (BWR-4, Mark-1, 784Mwe, in Operation)

- March 11 • Automatic scram due to the Earthquake
- Loss of offsite power
 - **2 Emergency DGs became inoperable by Tsunami**
 - Rx Core was being cooled by RCIC
- March 13 • Loss of Rx cooling function
- PCV vent
 - Rx water level down
 - Seawater injection was started
- March 14 • PCV pressure rose unusually
- **A hydrogen explosion occurred around Rx Building**
- March 15 • White smoke (steam) was being generated from Rx building
- March 16 • White smoke intensified
- March 17 • Water spray to Spent Fuel Pool was started



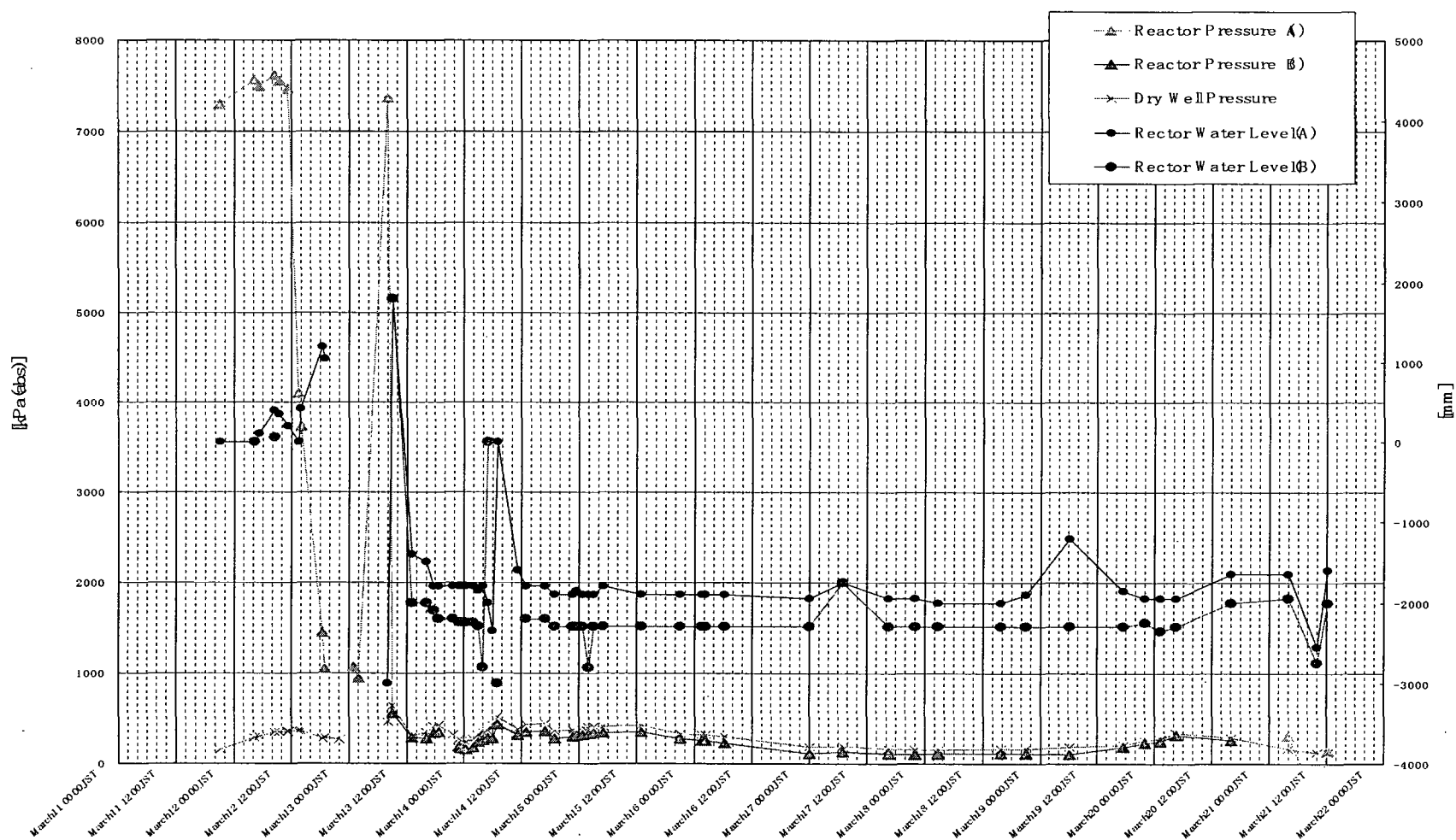
Fukushima Daiichi Unit-3 (BWR-4, Mark-1, 784Mwe, in Operation)

[Current Status, as of March 23]

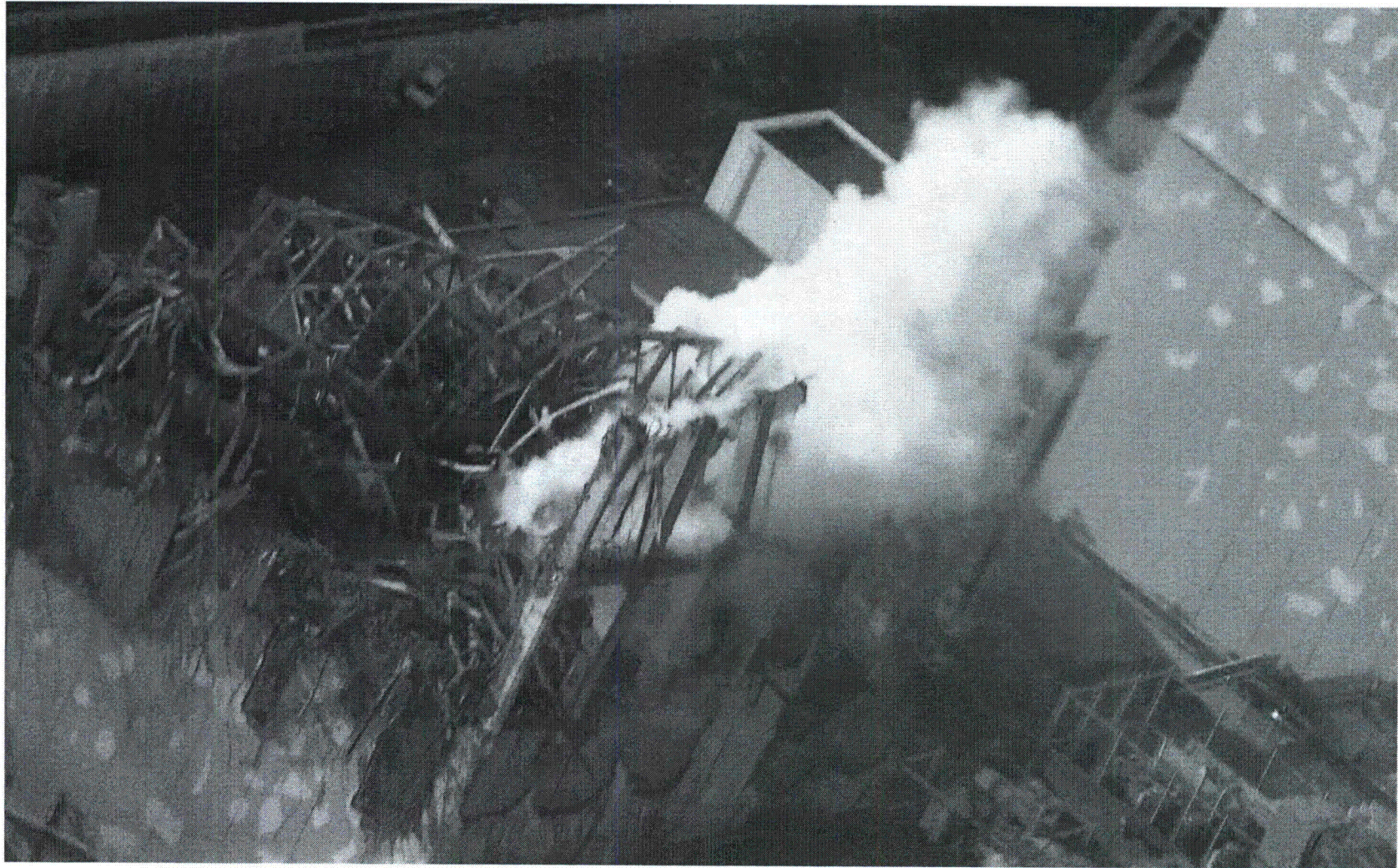
- Rx Water Level : TAF-1,800 mm, -2,300 mm
- Rx Pressure : ~ -0.104 MPaG, 0.034 MPaG
- PCV Pressure : ~ 0.100 MPaabs



Unit-3 Plant Parameters



Rx Building of Unit 3 (March 16)



Fukushima Daiichi Unit-4
(BWR-4, Mark-1, 784Mwe, in periodic refueling outage)

* All Fuels in Core were transferred in Spent Fuel Storage Pool

March 15 • Rx building was damaged

• Fire outbreak

March 16 • Fire outbreak

March 20 • Water spray to Spent Fuel Pool was started

[Current Status]

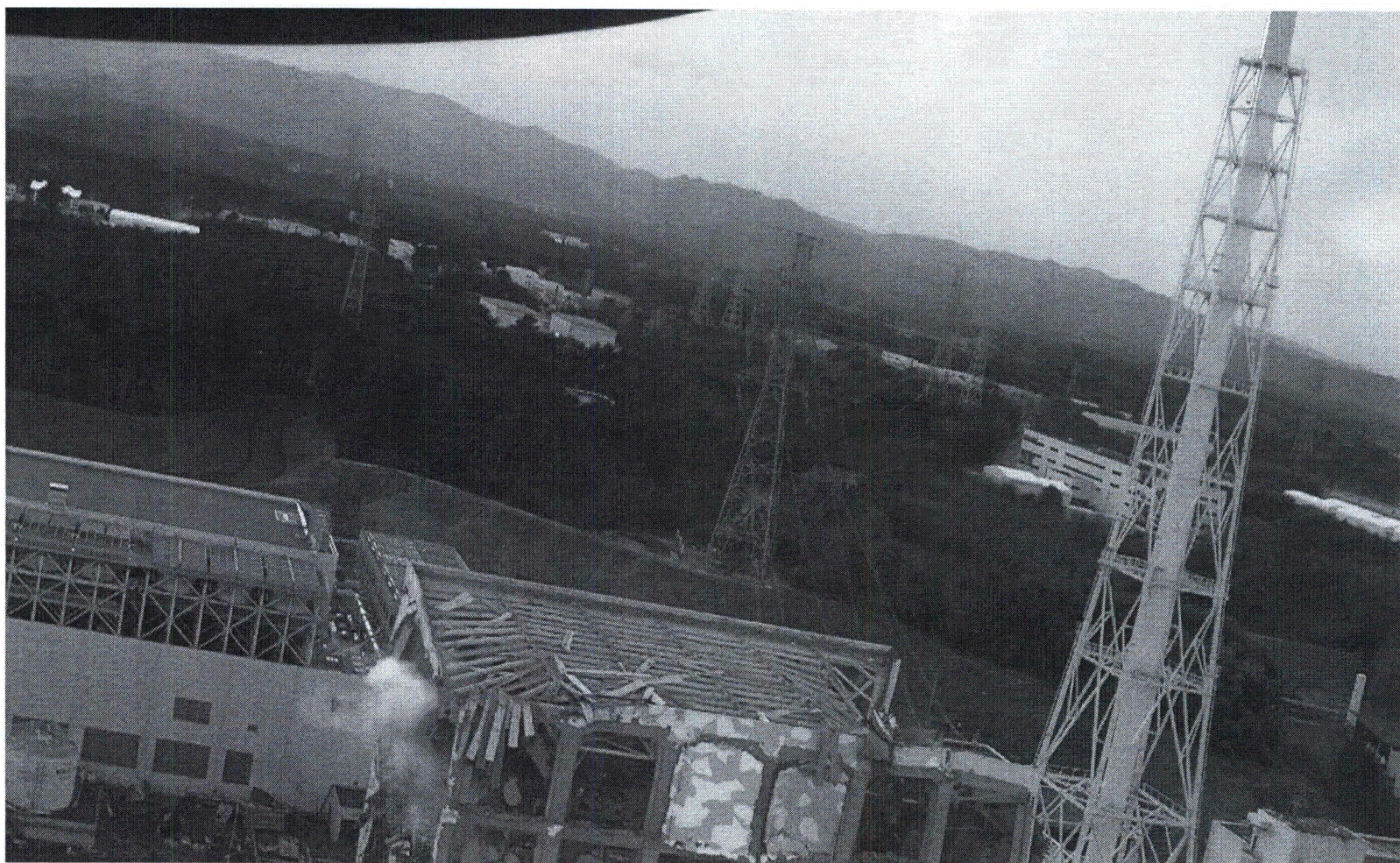
• Water spray to Spent Fuel Pool is being continued



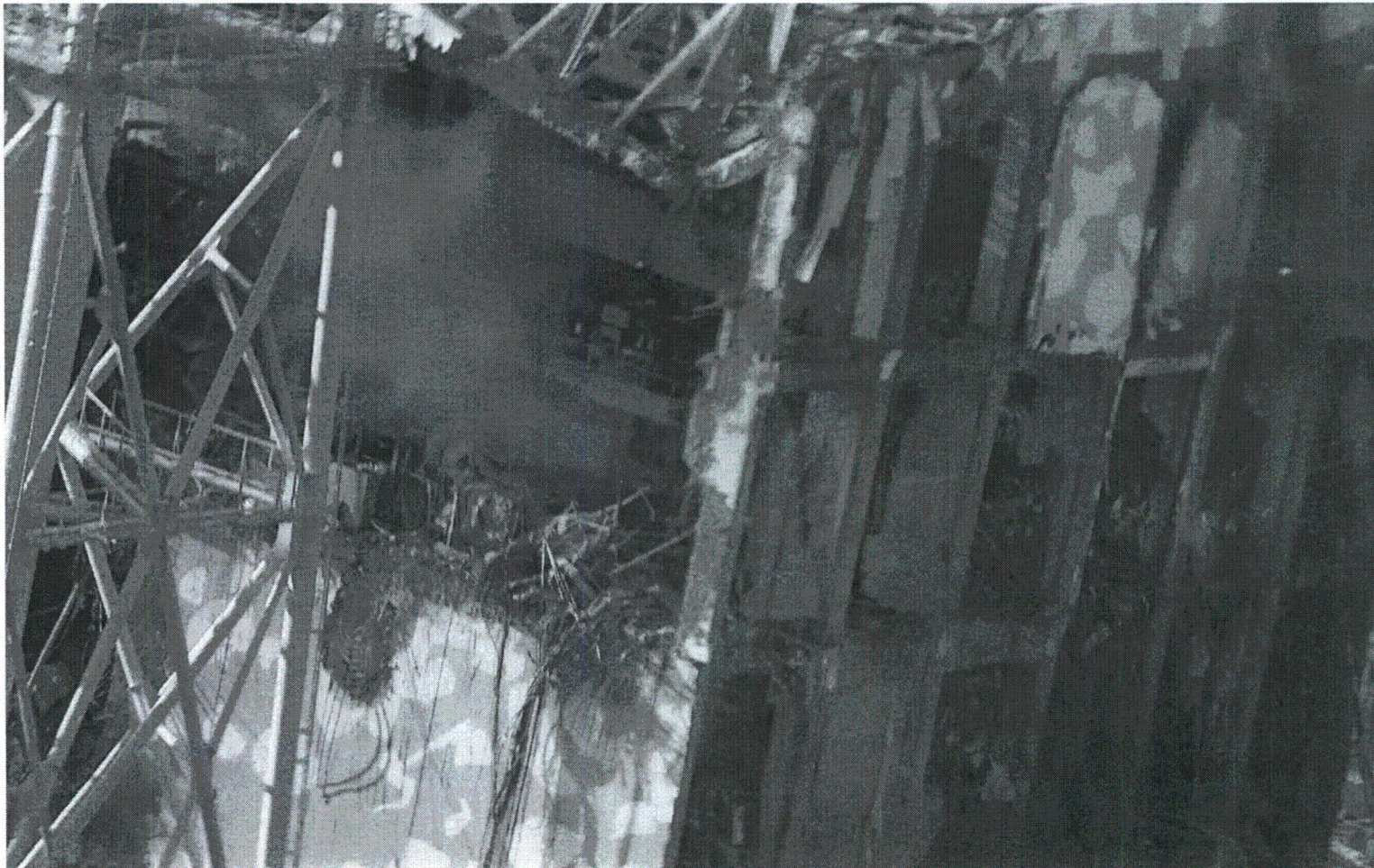
Rx Building of Unit 3 & Unit 4



Rx Building of Unit 4 (March 16)



Spent Fuel Pool of Unit 4 (March 16)



Fukushima Daiichi Unit-5

(BWR-4, Mark-1, 784Mwe, in periodic refueling outage)

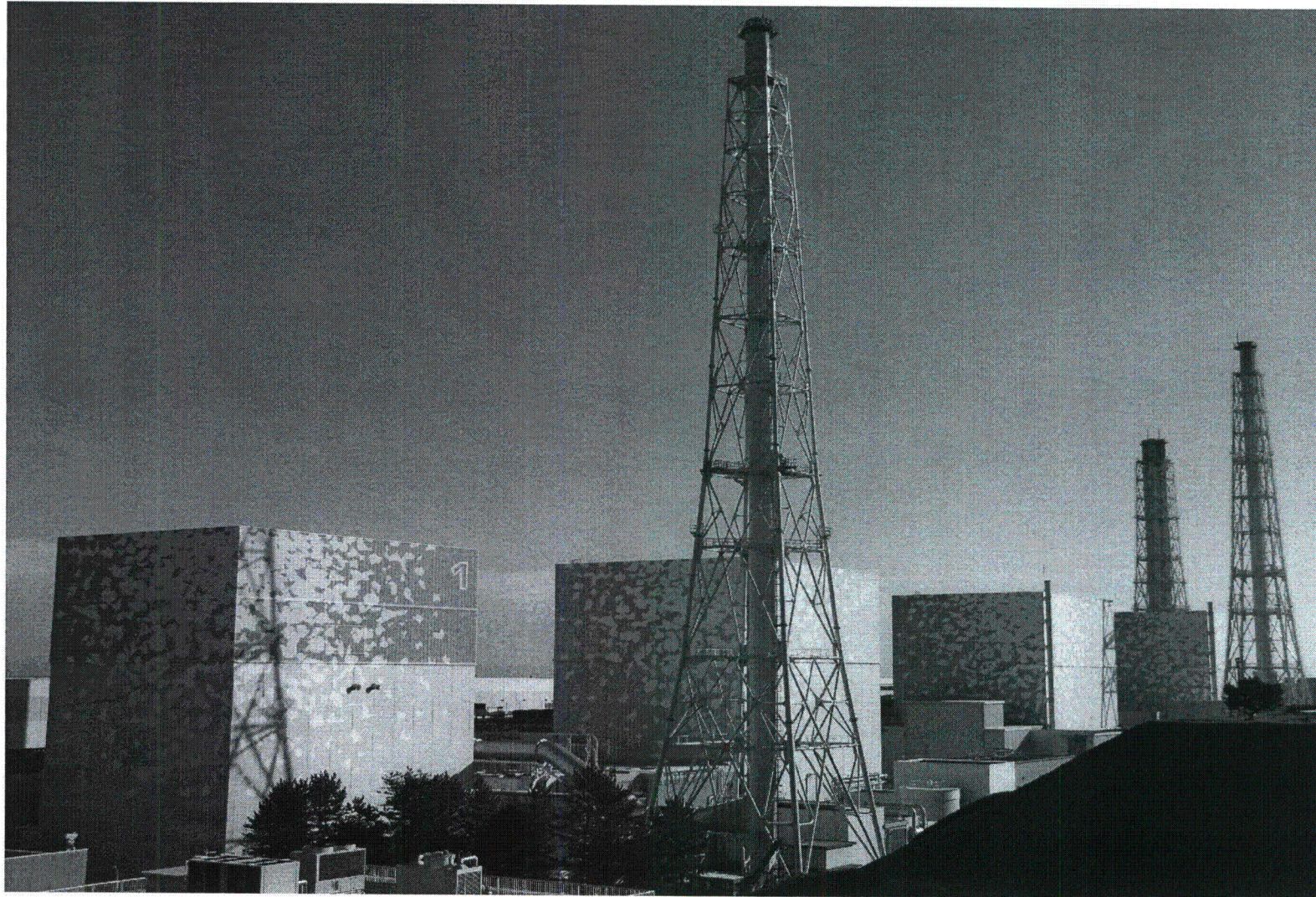
Fukushima Daiichi Unit-6

(BWR-5, Mark-2, 11,00Mwe, in periodic refueling outage)

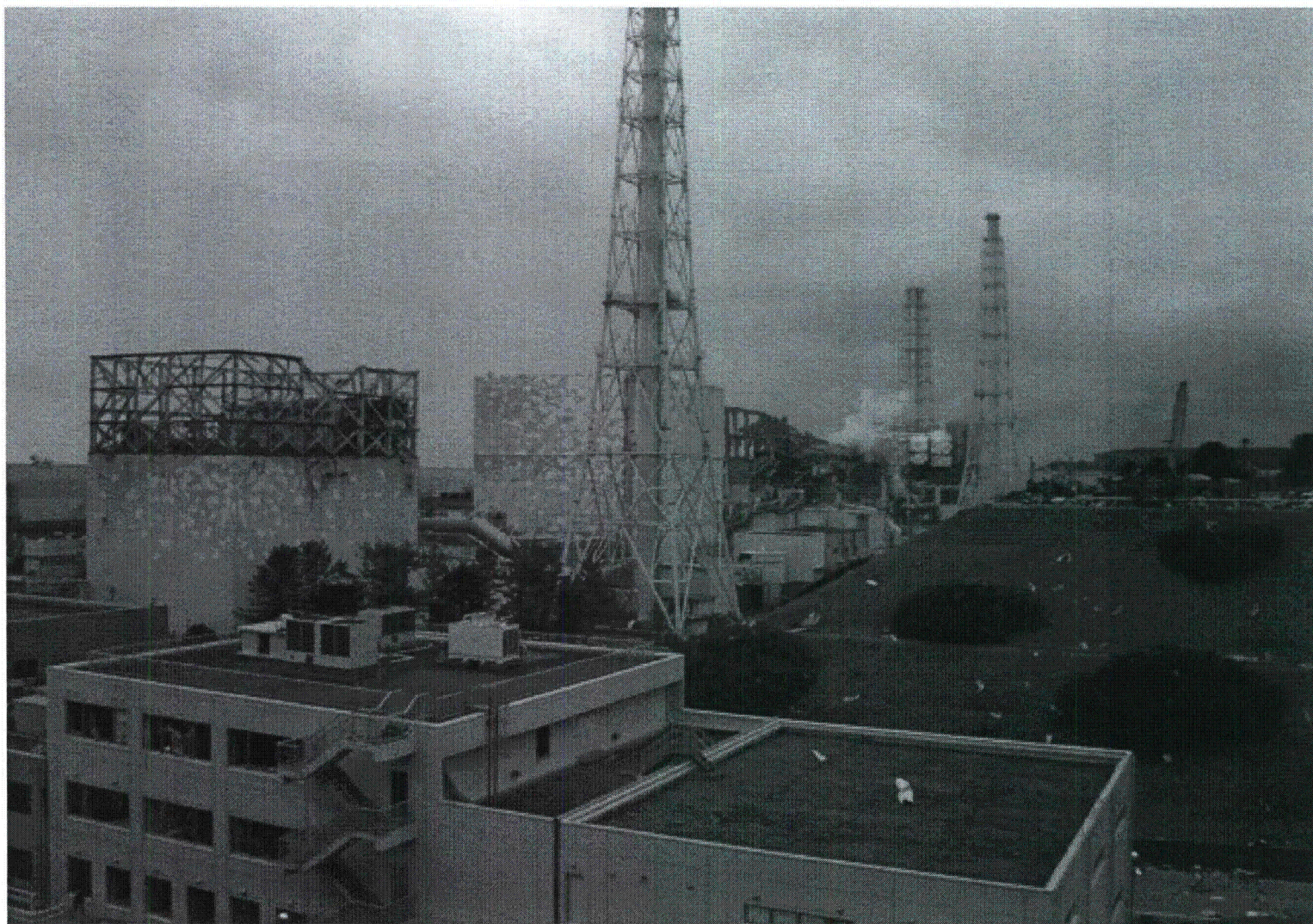
- March 11 • 1 Emergency DG for Unit 6 is operable
- March 19 • 2nd Emergency DG for Unit 6 started operation
 - 1 RHR Pump for Unit 5 started operation
 - 1 RHR Pump for Unit 6 started operation
- March 20 • Unit 5 Cold Shutdown
 - Unit 6 Cold Shutdown



Overview of Unit 1～4 (Before Accident)



Overview of Unit 1～Unit 4 (After Accident)

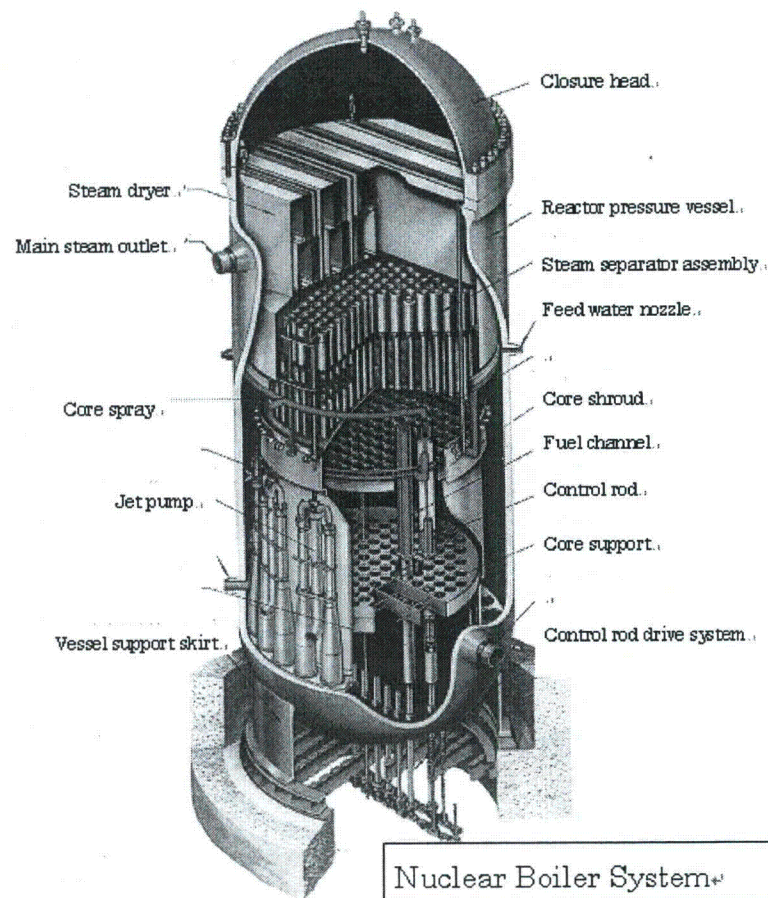
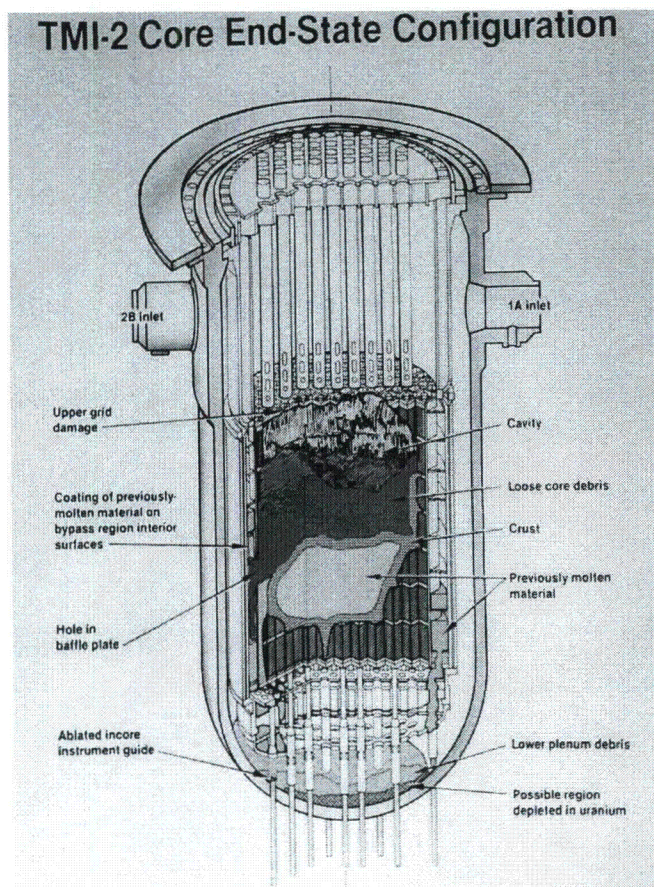


Video



3. Core Damage Estimation

Reactor Core



[Ref.: D.W.Akers, et al : Core Materials Inventory and Behavior : ANS Meeting Full Paper, November 1988]

4. Spent Fuel Damage Estimation about Unit 4 SFP

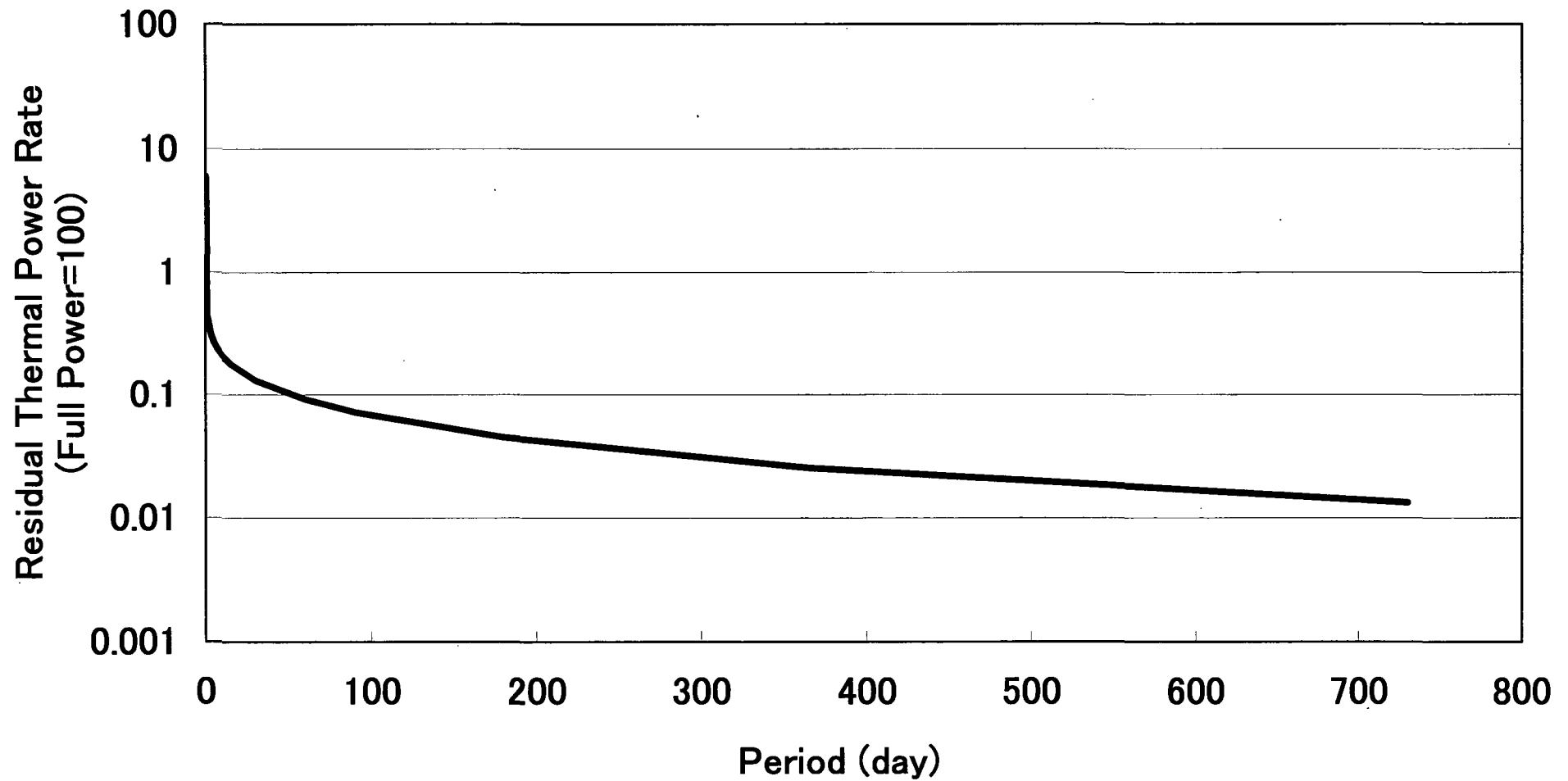
Situation of Spent Fuel Pool

4- 1

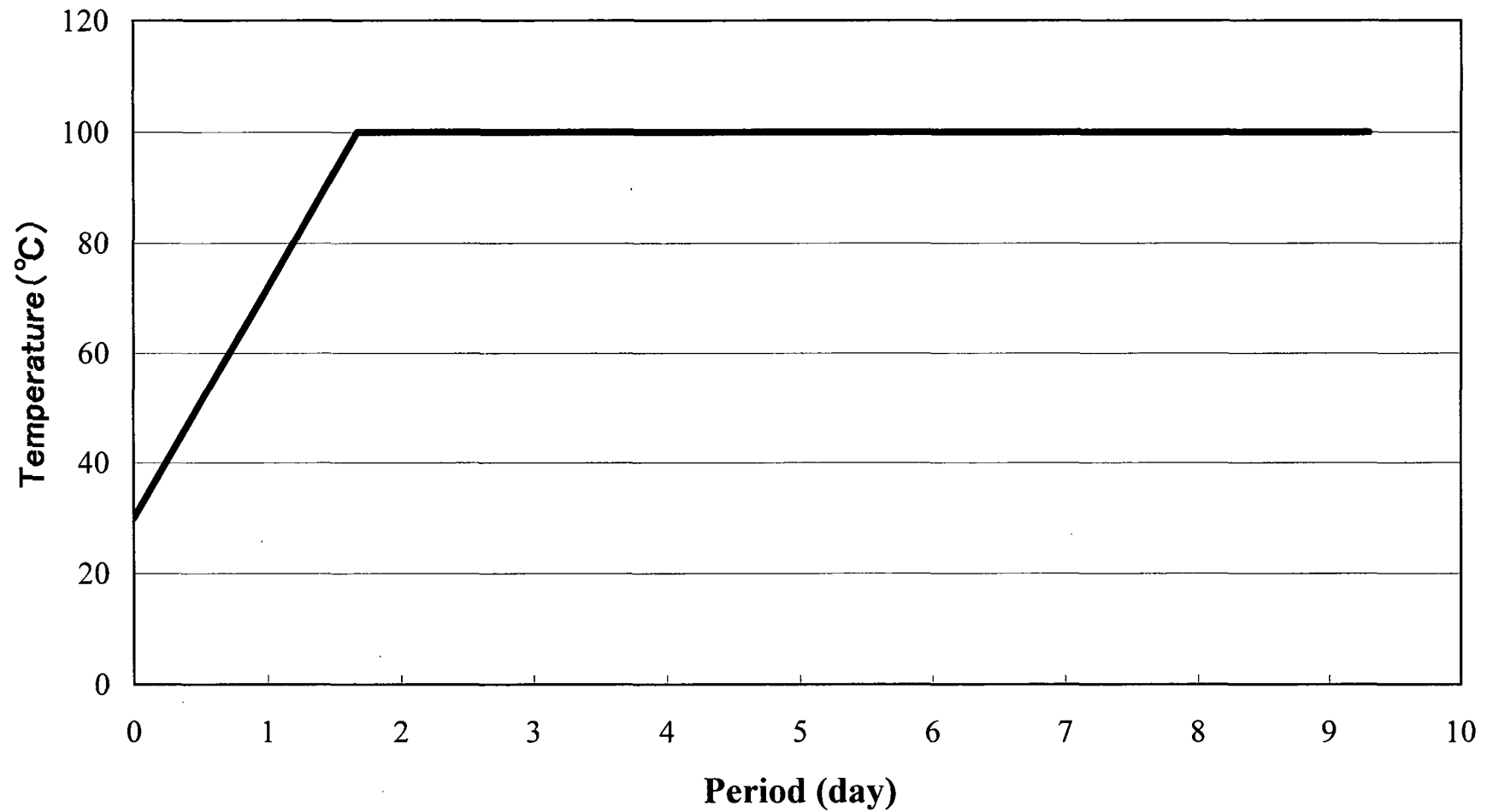
Unit	1	2	3	4	5	6
Number of Fuel Core SF Pool	400	548	548	-	548	764
	292	587	514	1,331	946	876
Thermal Power (kcal)	6E4	4E5	2E5	2E6	7E5	6E5
Water Volume (m3)	1,020	1,425	1,425	1,425	1,425	1,497

[Ref: Asahi Newspaper 2011/3/19]

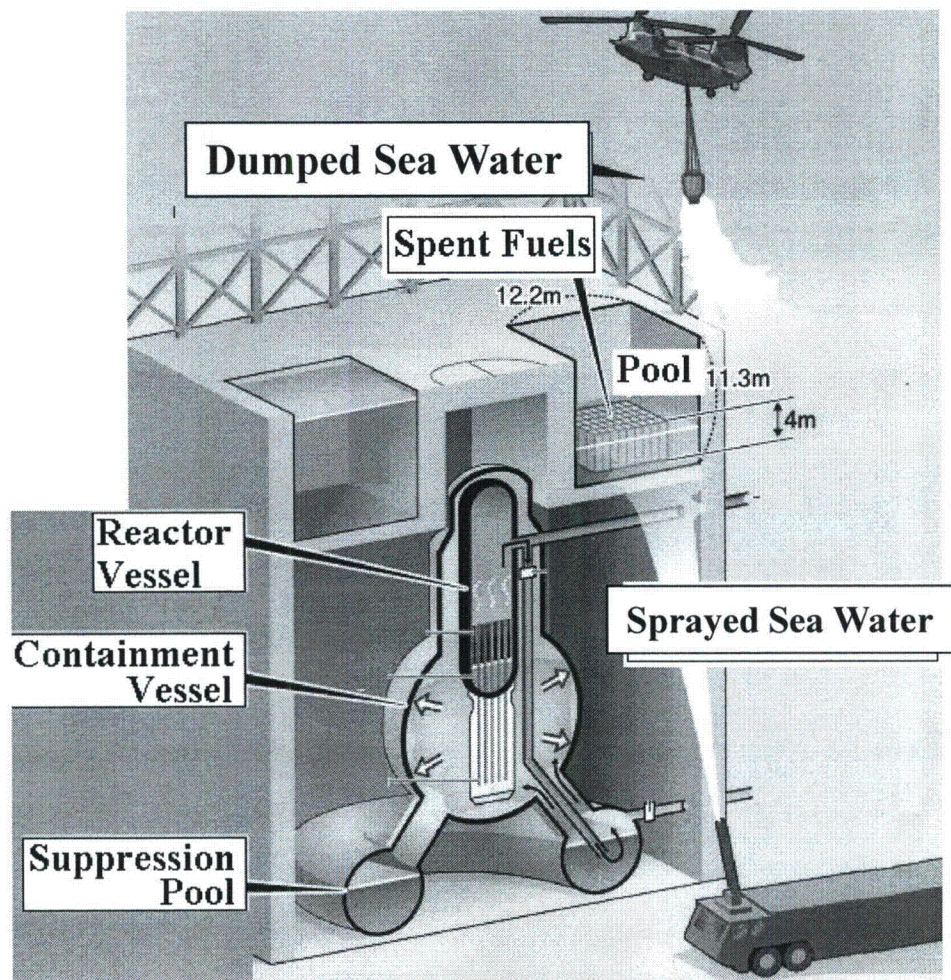
Residual Thermal Power Decrease



Temperature of SP Pool (Unit 4)



Cooling of Spent Fuel Pool



Spray Water on Unit 3.

**17th AM: Dumped Sea Water
from a helicopter (4 times)**

**17th PM: Sprayed Sea Water
from large-size fire engines**

Spray Water on Unit 4.

**20th AM: Sprayed Sea Water
from large-size fire engines**

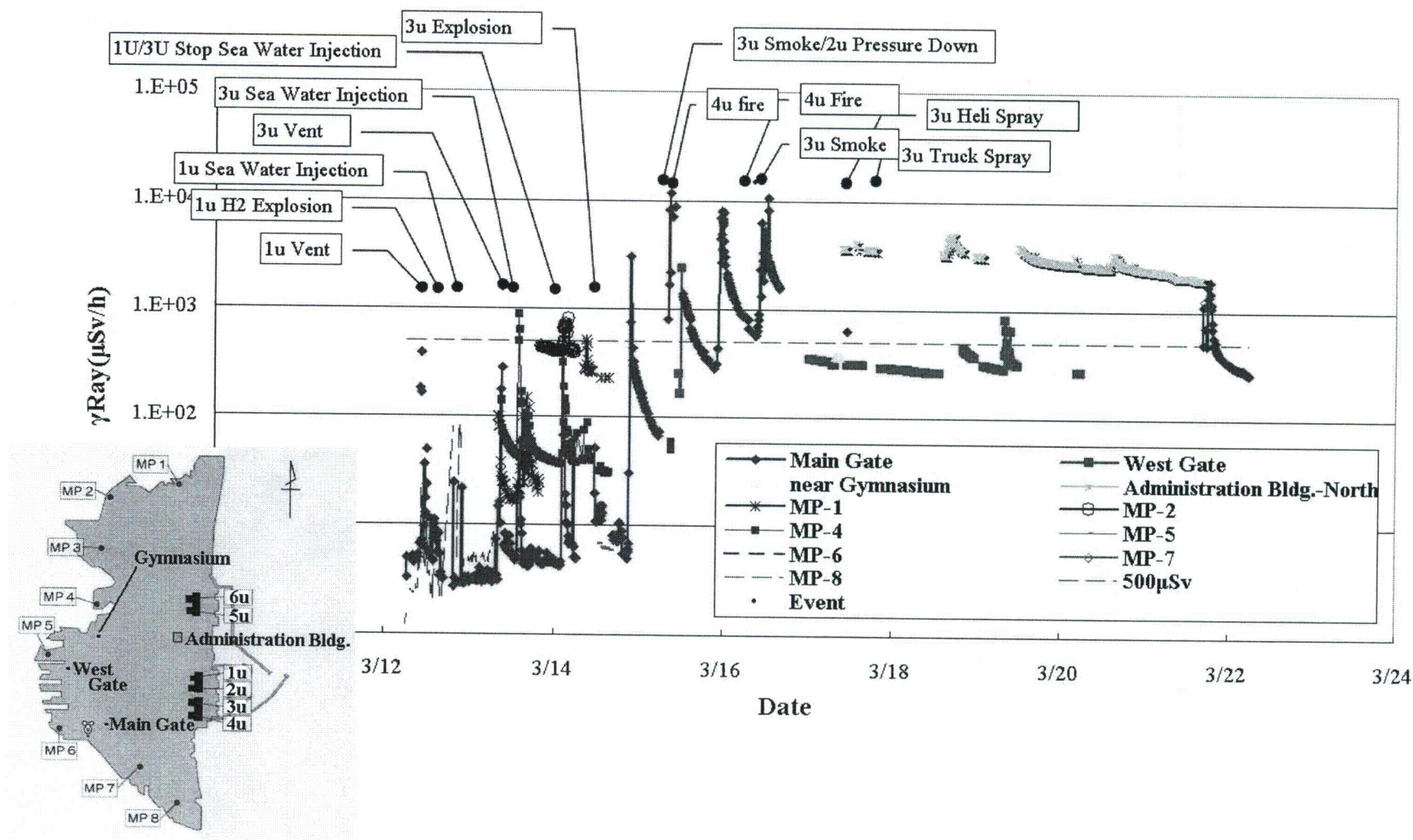
**[Report of Prime Minister of Japan and
his Cabinet 2011/3/20 22:00 P1/32]**

[Ref: Asahi Newspaper 2011/3/18]

5. Radiation Exposure and Monitoring Data

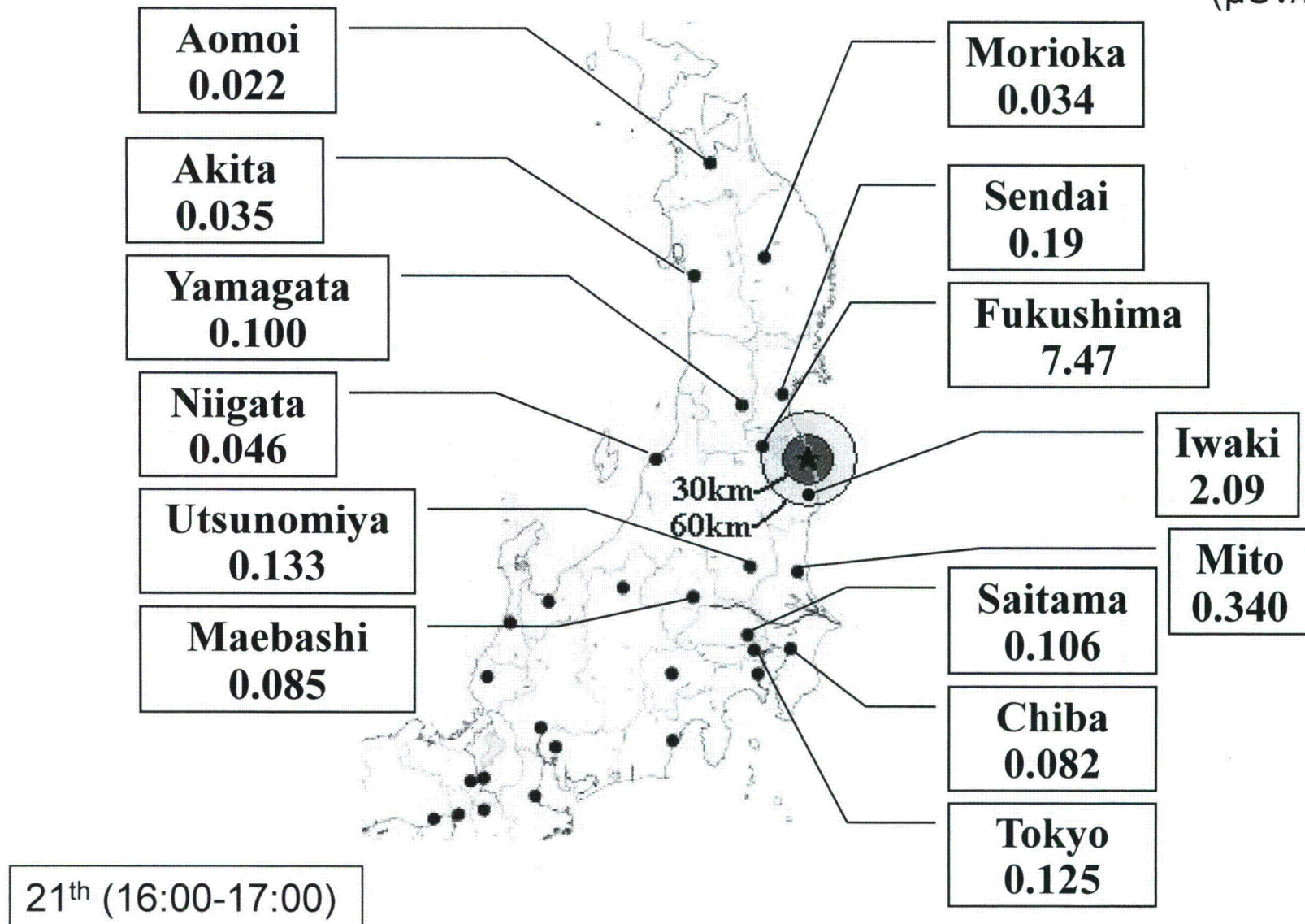
Radiation Dose at Power Station

5-1

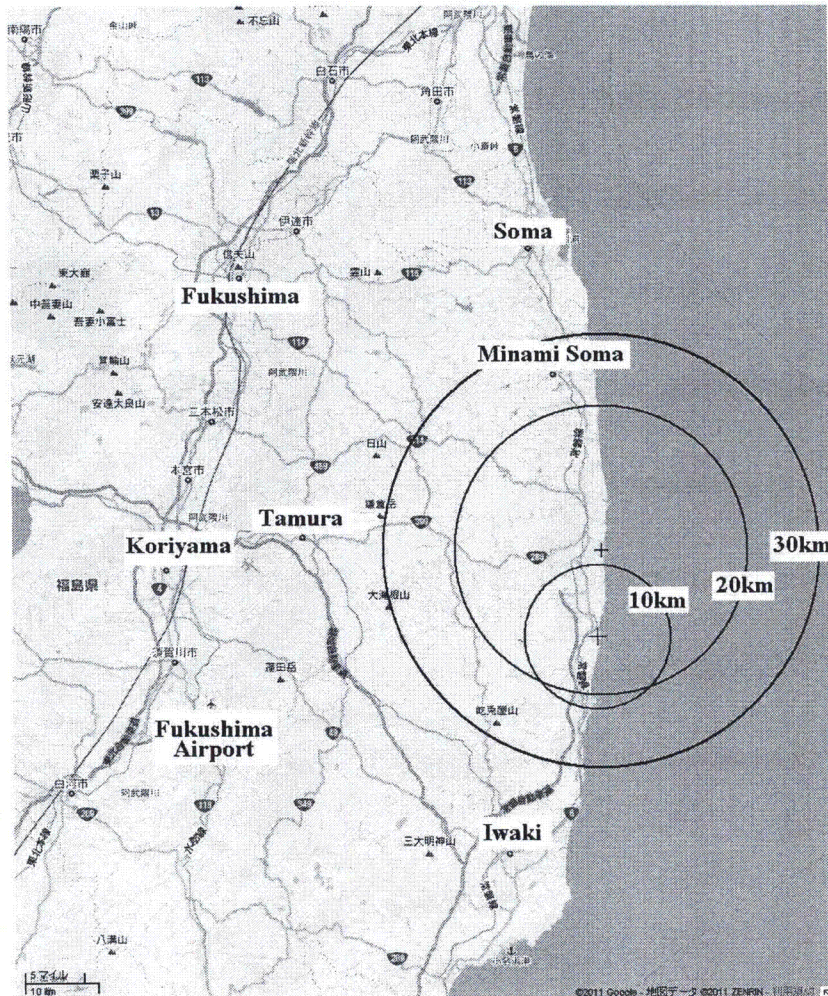


Radiation Dose at East Japan

(μSv/h)



Evacuation Advice of Government



11th 20:50: Evacuate from 2km sphere

21:23: Evacuate from 3km sphere

~ 6,000 persons

12th 05:44 : Evacuate from 10 km sphere

> 50,000 persons

18:25: Evacuate from 20 km

>170,000 persons

**[Report of Prime Minister of Japan and his Cabinet
2011/3/20 22:00 P10/32]**

Radiation Contamination

Food Contamination (20th March)

Element	Food	Prefecture	Radiation (Bq)
Iodine	Milk	Fukushima	932~1,510
	Spinach	Ibaragi	6,100~15,020
Cesium	Spinach	Ibaragi	524

The government requested that the contaminated food (Spinach, Milk) do not be distributed in the market on 20th March.

The Radioactive Material (Co, Cs) was detected in the sea water near NPP on 22th March.

Victim and Damage



	Dead	Missing	Evacuated
Total	6,911	19,370	403,975
Near NPPs			
(1)Onagawa			
Onagawa	-	4,500	5,500
Ishinomaki	~1,000	400	40,600
(2)Fukushima			
Soma	105	-	4,000
Minami Soma	176	100	5,700
Iwaki	145	-	6,500
Fukushima	-	-	8,000
Koriyama	-	-	5,400
Tamura	-	-	3,400

[Ref: Asahi Newspaper 2011/3/19]

6.Discussion

David Decker

From: E&E Publishing, LLC [ealerts@eenews.net]
Sent: Friday, March 11, 2011 1:36 PM
To: Decker, David
Subject: March 11 -- Greenwire is ready

Greenwire

THE LEADER IN ENERGY & ENVIRONMENTAL POLICY NEWS

AN E&E PUBLISHING SERVICE

GREENWIRE -- FRI., MARCH 11, 2011 -- [Read the full edition](#)

1. **JAPAN QUAKE:** Huge earthquake, tsunami kill hundreds in Japan; waves hit U.S. West Coast

The death toll in Japan began creeping into the hundreds and Hawaii, Alaska and most of the U.S. West Coast remained under a tsunami warning after a massive earthquake struck off the east coast of Honshu, Japan. The U.S. Geological Survey said the 8.9 magnitude quake struck 230 miles northeast of Tokyo and 80 miles east of Sendai, Japan, just before 1 a.m. President Obama opened a previously scheduled press conference on energy issues this afternoon by offering condolences to those affected by the disaster.

JAPAN EARTHQUAKE

2. **NUCLEAR:** Emergency declaration at nuclear plant forces thousands to evacuate
3. **NOAA:** Third U.S. tsunami center may be headed to Puerto Rico

TOP STORIES

4. **POLITICS:** Obama, API spar over gasoline prices, oil production
5. **CLIMATE:** House EPA bill would force U.S. consumers to waste oil -- Jackson
6. **LOBBYING:** U.S. Chamber begins push to limit environmental reviews of energy projects

CONGRESS

7. **SENATE:** Bill aims to boost domestic energy, especially ethanol
8. **HOUSE:** Resources panel opens new investigative office

CLIMATE CHANGE

9. **DEFENSE:** Climate change opens gaps for Navy operations

RRRR-295

ENERGY

- 10. **NATURAL GAS**: FERC probes gas, grid interplay in Southwest outages
- 11. **SMART GRID**: Calif. to let customers opt out of smart metering
- 12. **BIOFUELS**: Alt-fuel hopefuls make plays for oil companies' cash
- 13. **NATURAL GAS**: Mexico, Canada eye imports of U.S. shale gas
- 14. **COAL**: Wyo. court dismisses Sierra Club claims against coal-to-gas plant

AIR AND WATER

- 15. **AIR POLLUTION**: Updated EPA assessment shows declining toxic emissions
- 16. **WATER POLLUTION**: Planned Pa. suit aims to halt discharges of Marcellus waste
- 17. **OCEANS**: Small fish ingesting plastic waste -- study
- 18. **OCEANS**: 1 million fish died in a night, but cleanup could take a week

NATURAL RESOURCES

- 19. **MINING**: Ariz. permits rile environmentalists
- 20. **WILDLIFE**: Judge denies request to stop Yellowstone bison slaughter

HEALTH AND SAFETY

- 21. **GULF SPILL**: Evaporating oil likely posed a health threat -- study

WASTES & HAZARDOUS SUBSTANCES

- 22. **CHEMICALS**: Organic fertilizer maker indicted on fraud charges

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David Decker

From: Shane, Raeann
Sent: Friday, March 11, 2011 1:07 PM
To: Decker, David; Powell, Amy; Schmidt, Rebecca; Weil, Jenny; Quesenberry, Jeannette; Belmore, Nancy
Subject: Re: 12:30 EST Update on Facility Status from Region IV

Thanks.

From: Decker, David
To: Shane, Raeann; Powell, Amy; Schmidt, Rebecca; Weil, Jenny; Quesenberry, Jeannette; Belmore, Nancy
Sent: Fri Mar 11 12:50:25 2011
Subject: RE: 12:30 EST Update on Facility Status from Region IV

Thanks Raeann. I think Amy took the last call on the tsunami topic earlier today. Since then I haven't had any. Maybe the press release info is helping cut that down?

From: Shane, Raeann
Sent: Friday, March 11, 2011 12:49 PM
To: Powell, Amy; Schmidt, Rebecca; Decker, David; Weil, Jenny; Quesenberry, Jeannette; Belmore, Nancy
Subject: FW: 12:30 EST Update on Facility Status from Region IV
Importance: High

Latest from RIV. Conference call with the Chairman is now at 1:00 on the ET bridge. Have you guys been getting any calls from the Hill? I have not sent any updates out from here.

From: LIA12 Hoc
Sent: Friday, March 11, 2011 12:43 PM
To: Shane, Raeann
Subject: FW: 12:30 EST Update on Facility Status from Region IV
Importance: High

From: LIA01 Hoc
Sent: Friday, March 11, 2011 12:41 PM
To: LIA04 Hoc; LIA02 Hoc; LIA12 Hoc; LIA11 Hoc; LIA07 Hoc
Subject: FW: 12:30 EST Update on Facility Status from Region IV
Importance: High

From: Howell, Linda
Sent: Friday, March 11, 2011 12:40 PM
To: HOO Hoc; LIA01 Hoc
Cc: Wright, Ned
Subject: 12:30 EST Update on Facility Status from Region IV
Importance: High

Attached is an update for the chairman's use and for the Liaison Team.

RRR-296

From: Riley (OCA), Timothy
To: Harrington, Holly
Subject: FW: Information on emergency planning in the U.S.
Date: Tuesday, March 22, 2011 12:34:55 PM
Attachments: Information on emergency planning in the US.docx

Follow on from PMT regarding the 10 and 50 mile zones...

From: PMT03 Hoc
Sent: Tuesday, March 22, 2011 12:29 PM
To: Riley (OCA), Timothy
Cc: Hoc, PMT12
Subject: FW: Information on emergency planning in the U.S.

Forwarding the attachment per John Lubinski's (PMT Director) request.

Prosanta Chowdhury
PMT Coordinator
301-816-5407

RRRR-297

Information on emergency planning in the U.S.

- For domestic events, licensees are responsible for making protective action recommendations (PAR) based on plant conditions and/or dose projection, and emergency plans in place. The State then makes a protective action decision (PAD) to either use the licensee's PAR or to make their own decision. NRC monitors the PAR and the PAD.
- Each licensee has their own emergency procedures; however, most start with a 2-mile radius and 5-mile downwind evacuation. Some licensees recommend initial evacuation out to 10 miles, depending on plant conditions. Dose projections requiring PARs beyond 10 miles are provided to the States for PADs beyond 10 miles. Emergency planning zones are meant to be expanded, as necessary, depending on plant conditions. NRC believes this emergency preparedness basis is appropriate.
- In the US, the NRC has access to plant data via the ERDS network and can easily obtain plant data that may be used in RASCAL calculations to make evaluations of realistic protective actions. In addition, NRC has a detailed understanding of plant design for US plants and would not have to make assumptions, as was done for the Japanese plants and spent fuel pools.
- On March 16th the NRC recommended that American residents within 50 miles of the Fukushima reactors in Japan evacuate. This was based on extremely limited data from Japan that was used to develop two dose assessments using RASCAL. As discussed in the press release, this was based on system conditions for a hypothetical single reactor site (source terms were combined) and is not representative of an actual release.
- If these exact conditions occurred in the US, the State would have made a PAD and the NRC would have expected it to be similar to the PAR issued by NRC in this event. However, if this event were in the US, the NRC would have realistic data from the licensee and would not have to rely on hypothetical and overly conservative assumptions.

From: Brenner, Eliot
To: Sheehan, Neil; Hayden, Elizabeth; Harrington, Holly
Subject: RE: Draft blog post on 10-mile-radius EPZs
Date: Tuesday, March 22, 2011 12:37:34 PM

Neil: I am fine with this with one edit below. I would appreciate it if Holly went over it with a fine tooth comb.

In this sentence in the next to last pgh, I want to add/edit the bold few words

. As the NRC carefully monitored developments there, the agency used the best information available to it to make a protective action recommendation **to the U.S. Embassy in Tokyo for Americans within 50 miles of the six-reactor Japanese plants which were experiencing problems in four reactors and two spent fuel pools.** It is also worth noting the United States has no nuclear complexes of this size.

Or words to that effect.

Thanks.

eliot

From: Sheehan, Neil
Sent: Tuesday, March 22, 2011 11:25 AM
To: Brenner, Eliot; Hayden, Elizabeth; Harrington, Holly
Subject: Draft blog post on 10-mile-radius EPZs

Here's my first crack at it.

RRRR-298

DRAFT Blog Post

Whether by virtue of regular testing of sirens, mailings about emergency plans or possibly the receipt of potassium iodide (KI) pills, there are frequent reminders for those who live within a 10-mile radius of a U.S. nuclear power plant of the need to be ready should a significant event occur at the facility.

This area is known as the Emergency Planning Zone (EPZ), and it is well established in federal regulations as the focal point of preparing for a severe accident at a reactor.

Some confusion has cropped up in the media and elsewhere recently regarding the size of EPZs in the wake of developments involving four of the six Fukushima Daiichi reactors in Japan. The source of this confusion appears to stem from the U.S. Nuclear Regulatory Commission (NRC) advisory on March 16th for American citizens who were within 50 miles of the plant to evacuate: <http://pbadupws.nrc.gov/docs/ML1108/ML110800133.pdf> .

The advisory was based on calculations done by NRC experts indicating releases from the four hobbled Japanese plants could – and a key word there is *could* – possibly exceed conservatively set safe radiation-exposure limits for the public.

On its face, this recommendation seems to be at odds with the size used for American EPZs. In fact, it was consistent with the same kind of approach that would be used in the United States should a comparable, although extremely unlikely, event take place here.

In November 1976, a task force of NRC and Environmental Protection Agency (EPA) (?????NO FEMA INVOLVEMENT???) representatives was formed to look at salient emergency planning issues for U.S. nuclear power plants. Out of that comprehensive evaluation came a recommendation that a 10-mile-radius EPZ would assure that “prompt and effective actions can be taken to protect the public in the event of an accident” at a plant. This was based on research showing the most significant impacts of an accident would be expected in the immediate vicinity of a plant and therefore any initial protective actions, such as evacuations or sheltering in place, should be focused there. Put another way, the projected radiation levels would not be expected to exceed EPA protective action dose guidelines (1 to 5 rems) beyond 10 miles under most accident scenarios.

That does not mean the protective actions could not expand beyond the 10-mile radius. Rather, emergency planners have always known such actions could be necessary if the situation warranted it. Indeed, U.S. nuclear power plants are required to consider and drill for the possibility of radiation releases that could have impacts up to 50 miles away, in addition to the required biennial exercises conducted in the vicinity of each nuclear power plant to assess implementation of the emergency plan within the 10 mile EPZ. Once every six years, each plant

takes part in a graded exercise to demonstrate how it would handle such an event, which typically would involve such actions as placing cattle on stored feed and holding off on the harvesting of crops until readings indicated radiation levels were back to normal.

As a key NRC/FEMA report on emergency planning states, "In a particular emergency, protective actions might well be restricted to a small part of the planning zone. On the other hand, for the worst possible accidents, protective actions would need to be taken outside the planning zones."

The Japanese have been confronted with extremely challenging circumstances wrought by a record earthquake followed by a massive tsunami. As the NRC carefully monitored developments there, the agency used the best information available to it to make a protective action recommendation **to the U.S. Embassy in Tokyo for Americans within 50 miles of the six-reactor Japanese site, which was experiencing problems in four reactors and two spent fuel pools.**

Were a similar accident to occur in the U.S., the response would be guided by the same considerations. But it **is worth noting the United States has no nuclear complexes of this size.**

Once the salient facts regarding the events at Fukushima Daiichi are made clear to the NRC, it intends to assess its own regulations and practices for any pertinent lessons learned that can be applied here. This will include an assessment of current emergency planning guidance and policy.

As the NRC carefully monitored developments there, the agency used the best information available to it to make a protective action recommendation

More information on emergency planning for U.S. nuclear power plants is available on the NRC web site at: <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/fs-emerg-plan-prep-nuc-power.html> .

From: Sheehan, Neil
To: Harrington, Holly
Subject: RE: Draft blog post on 10-mile-radius EPZs
Date: Tuesday, March 22, 2011 11:42:06 AM

I'll run it by Bill, too. He just got back into the office.

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 11:41 AM
To: Sheehan, Neil; Brenner, Eliot; Hayden, Elizabeth
Subject: RE: Draft blog post on 10-mile-radius EPZs

Eliot – please review.

Neil – does this meet Bill's need?

All – once everyone is good with the verbiage, we'll need to get OK from ET or PMT.

Holly

From: Sheehan, Neil
Sent: Tuesday, March 22, 2011 11:25 AM
To: Brenner, Eliot; Hayden, Elizabeth; Harrington, Holly
Subject: Draft blog post on 10-mile-radius EPZs

Here's my first crack at it.

RRRR-299

DRAFT

Whether by virtue of regular testing of sirens, mailings about emergency plans or possibly the receipt of potassium iodide (KI) pills, there are frequent reminders for those who live within a 10-mile radius of a U.S. nuclear power plant of the need to be ready should a significant event occur at the facility.

This area is known as the Emergency Planning Zone (EPZ), and it is well established in federal regulations as the focal point of preparing for a severe accident at a reactor.

Some confusion has cropped up in the media and elsewhere recently regarding the size of EPZs in the wake of developments involving the Fukushima Daiichi reactors in Japan. The source of this confusion appears to stem from the U.S. Nuclear Regulatory Commission (NRC) advisory on March 16th for American citizens who were within 50 miles of the plant to evacuate: <http://pbadupws.nrc.gov/docs/ML1108/ML110800133.pdf>.

The advisory was based on calculations done by NRC experts indicating releases from the hobbled Japanese plant could – and a key word there is *could* – possibly exceed conservatively set safe radiation-exposure limits for the public.

On its face, this recommendation seems to be at odds with the size used for American EPZs. In fact, it was consistent with the same kind of approach that would be used in the United States should a comparable event take place here.

In November 1976, a task force of NRC and Environmental Protection Agency (EPA) representatives was formed to look at salient emergency planning issues for U.S. nuclear power plants. Out of that comprehensive evaluation came a recommendation that a 10-mile-radius EPZ would assure that “prompt and effective actions can be taken to protect the public in the event of an accident” at a plant. This was based on research showing the most significant impacts of an accident would be expected in the immediate vicinity of a plant and therefore any initial protective actions, such as evacuations or sheltering in place, should be focused there. Put another way, the projected radiation levels would not be expected to exceed EPA protective action dose guidelines (1 to 5 rems) beyond 10 miles under most accident scenarios.

That does not mean the protective actions could not expand beyond the 10-mile radius. Rather, emergency planners have always known such actions could be taken if the situation warranted it. Indeed, U.S. nuclear power plants are required to consider and drill for the possibility of radiation releases that could have impacts up to 50 miles away. Once every six years, each plant takes part in a graded exercise to demonstrate how it would handle such an event, which typically would involve such actions as placing cattle on stored feed and holding off on the harvesting of crops until readings indicated radiation levels were back to normal.

As a key NRC/FEMA report on emergency planning states, "In a particular emergency, protective actions might well be restricted to a small part of the planning zone. On the other hand, for the worst possible accidents, protective actions would need to be taken outside the planning zones."

The Japanese have been confronted with extremely challenging circumstances wrought by a record earthquake followed by a massive tsunami. As the NRC carefully monitored developments there, the agency used the best information available to it to make a protective action recommendation that was in response to a situation involving several reactors and spent fuel pools experiencing significant cooling problems. Were a similar accident to occur in the U.S., the response would be guided by the same considerations.

More information on emergency planning for U.S. nuclear power plants is available on the NRC web site at: <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/fs-emerg-plan-prep-nuc-power.html> .

From: [Harrington, Holly](#)
To: [Hayden, Elizabeth](#)
Subject: FW: Information on emergency planning in the U.S.
Date: Tuesday, March 22, 2011 11:39:00 AM
Attachments: [Information on emergency planning in the US.docx](#)

Do you think it would be helpful to polish these up a bit and post on the japan page?

From: PMT03 Hoc
Sent: Tuesday, March 22, 2011 10:54 AM
To: Harrington, Holly
Cc: Hoc, PMT12
Subject: Information on emergency planning in the U.S.

Holly:

Per your request to Kathryn Brock (PMT), attached is the subject information. Should you have questions, please contact Kathryn at PMT12.hoc@nrc.gov, or 301-816-5415.

Prosanta Chowdhury
PMT Coordinator
301-816-5407

RRRR-300

Information on emergency planning in the U.S.

- For domestic events, licensees are responsible for making protective action recommendations (PAR) based on plant conditions and/or dose projection, and emergency plans in place. The State then makes a protective action decision (PAD) to either use the licensee's PAR or to make their own decision. NRC monitors the PAR and the PAD.
- Each licensee has their own emergency procedures; however, most start with a 2-mile radius and 5-mile downwind evacuation. Some licensees recommend initial evacuation out to 10 miles, depending on plant conditions. Dose projections requiring PARs beyond 10 miles are provided to the States for PADs beyond 10 miles. Emergency planning zones are meant to be expanded, as necessary, depending on plant conditions. NRC believes this emergency preparedness basis is appropriate.
- In the US, the NRC has access to plant data via the ERDS network and can easily obtain plant data that may be used in RASCAL calculations to make evaluations of realistic protective actions. In addition, NRC has a detailed understanding of plant design for US plants and would not have to make assumptions, as was done for the Japanese plants and spent fuel pools.
- On March 16th the NRC recommended that American residents within 50 miles of the Fukushima reactors in Japan evacuate. This was based on extremely limited data from Japan that was used to develop two dose assessments using RASCAL. As discussed in the press release, this was based on system conditions for a hypothetical single reactor site (source terms were combined) and is not representative of an actual release.
- If these exact conditions occurred in the US, the State would have made a PAD and the NRC would have expected it to be similar to the PAR issued by NRC in this event. However, if this event were in the US, the NRC would have realistic data from the licensee and would not have to rely on hypothetical and overly conservative assumptions.

From: [Harrington, Holly](#)
To: [PMT03 Hoc](#)
Cc: [Hoc, PMT12](#)
Subject: RE: Information on emergency planning in the U.S.
Date: Tuesday, March 22, 2011 1:23:00 PM
Attachments: [EPZBlogPost.docx](#)

Can Kathryn Brock please review this as soon as possible? I'll also follow up with a call.

Thanks,
Holly

From: PMT03 Hoc
Sent: Tuesday, March 22, 2011 10:54 AM
To: Harrington, Holly
Cc: Hoc, PMT12
Subject: Information on emergency planning in the U.S.

Holly:

Per your request to Kathryn Brock (PMT), attached is the subject information. Should you have questions, please contact Kathryn at PMT12.hoc@nrc.gov, or 301-816-5415.

Prosanta Chowdhury
PMT Coordinator
301-816-5407

RRRR-301

From: PMT03 Hoc
To: Shoop, Undine; Harrington, Holly; Riley (OCA), Timothy
Subject: Assumed plant conditions supporting March 16, 2011 NRC press release.docx
Date: Tuesday, March 22, 2011 1:10:41 PM
Attachments: Assumed plant conditions supporting March 16, 2011 NRC press release.docx

RRRR-302

Assumed plant conditions supporting March 16, 2011 NRC press release

There are two dose assessments attached to the March 16th (2011) NRC press release. Both assessments are hypothetical, stylized analyses of consequences of releases from the Fukushima nuclear power plant Units 2, 3 and 4.

The first assessment assumed release from one reactor unit, specifically Unit 2. It assumed an ex-vessel, unfiltered release from a totally failed containment, 100% fuel damage, and actual meteorological conditions during early morning hours. The low dispersion characteristics included low wind speeds, relatively stable air, and light precipitation. The assessment considered the conditions of the plant at the time and possible degrading conditions. The assumptions included total failure, sprays off, no removal mechanism (e.g., scrubbing), no mitigation by the operator. A ground level release was assumed with release duration of 16 hours.

The second assessment represented multiple unit failures, in this case Units 2 and 3 and the spent fuel pool (SFP) of Unit 4. Specifically, it assumed 30% core damage at Units 2 and 3, and 100% fuel damage for the Unit 4 spent fuel pool. The Unit 4 spent fuel pool was assumed to include only a full core offload from the current outage. To account for the combined inventories of the three units sources (i.e., from Units 2 and 3 and Unit 4 spent fuel pool), the staff adjusted the reactor power level, fuel burnup and number of assemblies, and included that in one calculation. This resulted in 917 assemblies in the core. The assumptions included total failure, sprays off, no removal mechanism (e.g., scrubbing), no mitigation by the operator. The meteorological conditions for the second assessment also assumed actual conditions with light precipitation, fairly stable wind conditions with occasional higher wind speeds and less stable atmospheric conditions, resulting in greater atmospheric dispersion. A ground level release was assumed with release duration of 15 hours.

From: Couret, Ivonne
To: Harrington, Holly
Subject: FW: Japan 2011 Earthquake and Tsunami -- U.S. Government Information
Date: Tuesday, March 22, 2011 4:36:48 PM

FYI

Ivonne L. Couret
Public Affairs Officer
Office of Public Affairs
Media Desk
opa.resource@nrc.gov
301-415-8200

Visit our online photo gallery. Incorporate graphics and photographs to tell your story!
<http://www.nrc.gov/reading-rm/photo-gallery/>

2010-2011 Information Digest - Where you can find NRC Facts at a Glance
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1350/>

From: USA.gov Team [mailto:subscriptions@subscriptions.usa.gov]
Sent: Tuesday, March 22, 2011 4:35 PM
To: Couret, Ivonne
Subject: Japan 2011 Earthquake and Tsunami -- U.S. Government Information

Visit USA.gov's new page, **Japan 2011 Earthquake and Tsunami -- U.S. Government Information**. You'll find a variety of resources from across the government, including:

- Updates on **air quality** and **food safety in the United States**.
- Information about **Potassium Iodide (KI)**.
- Monitoring of **food, mail, and cargo from Japan**.
- Information about **evacuations for Americans in Japan**.
- Advisories on **travel to Japan**.
- Information about **donations** and **relief efforts**.
- **Disaster preparedness** resources.

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RRRR-303

From: Harrington, Holly
To: Brenner, Eliot
Subject: RE: blog i mentioned
Date: Tuesday, March 22, 2011 4:34:00 PM
Attachments: blogpostdraftmarch23.docx

Here you go. A few outstanding questions for the techies in red are being pursued.

From: Brenner, Eliot
Sent: Tuesday, March 22, 2011 4:16 PM
To: Harrington, Holly
Subject: FW: blog i mentioned

Please weave this in, resend to me, and I will ship it upstairs.

eliot

From: Batkin, Joshua
Sent: Tuesday, March 22, 2011 4:13 PM
To: Brenner, Eliot
Subject: RE: blog i mentioned

Let's edit this with the message with this idea and then show him:

Just like we would do here in the US, we issued a prudent precaution for potential exposures that was based on the information we had at the time and its reliability. Unfortunately there has since been public reporting that actual dose readings out to 30 kms in Japan have shown levels that exceed our PAGs here in the US. Therefore the 50 mile evacuation is no longer just a prudent precaution based on what could happen, but has proved to be a necessary step based on the tragic situation that has unfolded so far.

From: Brenner, Eliot
Sent: Tuesday, March 22, 2011 3:37 PM
To: Batkin, Joshua
Subject: blog i mentioned

From: Brenner, Eliot
Sent: Tuesday, March 22, 2011 3:30 PM
To: Harrington, Holly
Subject: RE: blog post for tomorrow sometime; approved by PMT. OK?

See my questions and slight rewrites. I would run this past the techies first before it goes any farther.

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 3:15 PM
To: Brenner, Eliot
Subject: blog post for tomorrow sometime; approved by PMT. OK?

Details Behind our March 16th Announcement

RRRR-304

We're getting follow-up questions from the public on how the NRC reached the conclusions that prompted out the direction march 16 from the U.S. Embassy in Tokyo that U.S. citizens within 50 miles of the Fukushima reactors evacuate the area. I reached out to some of the technical experts to provide additional information about what went into two sets of computer calculations that were run.

Here is what they say:

Both assessments are hypothetical, stylized analyses of consequences of releases from the Fukushima nuclear power plant Units 2, 3 and 4. WHAT HAPPENED WITH UNIT 1 IN THESE CALCULATIONS?

The first assessment assumed release from one reactor unit, specifically Unit 2. It assumed all fuel melted and escaped from the reactor core, that containment failed, and it used actual meteorological conditions during early morning hours. The low dispersion characteristics included low wind speeds, relatively stable air, and light precipitation.

The assessment considered the conditions of the plant at the time and possible degrading conditions. The assumptions included total failure, sprays off, no removal mechanism (e.g., scrubbing), no mitigation by the operator. A ground level release was assumed with release duration of 16 hours.

The second assessment represented multiple unit failures, in this case Units 2 and 3 and the spent fuel pool (SFP) of Unit 4. Specifically, it assumed 30 percent core damage at Units 2 and 3, and 100 percent fuel damage for the Unit 4 spent fuel pool. The Unit 4 spent fuel pool was assumed to include only a full core offload from the current outage. To account for the combined inventories of the three units sources (i.e., from Units 2 and 3 and Unit 4 spent fuel pool), the staff adjusted the reactor power level, fuel burn up and number of assemblies, and included that in one calculation. This resulted in 917 assemblies in the core. (I do not understand that last sentence. If it read cores (plural) it might make sense)

The assumptions included total failure, sprays off, no removal mechanism (e.g., scrubbing), no mitigation by the operator. The meteorological conditions for the second assessment also assumed actual conditions with light precipitation, fairly stable wind conditions with occasional higher wind speeds and less stable atmospheric conditions, resulting in greater atmospheric dispersion. A ground level release was assumed with release duration of 15 hours.

I hope this explanation is helpful.

Eliot Brenner
Public Affairs Director

Draft Blog Post

We're getting follow-up questions from the public on how the NRC reached the conclusions that prompted the U.S. Embassy in Tokyo on March 16 to recommend that U.S. citizens within 50 miles of the Fukushima reactors evacuate the area. I reached out to some of our technical experts to provide additional information about what went into two sets of computer calculations that were run.

Here is what they say:

Both assessments are hypothetical, stylized analyses of consequences of releases from the Fukushima nuclear power plant Units 2, 3 and 4. (Question still to be answered: Why does this omit mention of Unit 1?)

The first assessment assumed release from Reactor Unit 2. It assumed all fuel melted and escaped from the reactor core, that containment failed, and it used actual meteorological conditions during early morning hours. The low dispersion characteristics included low wind speeds, relatively stable air, and light precipitation.

The assessment considered the conditions of the plant at the time and possible degrading conditions. The assumptions included total failure, sprays off, no removal mechanism (e.g., scrubbing), no mitigation by the operator. A ground level release was assumed with release duration of 16 hours.

The second assessment represented multiple unit failures, in this case Units 2 and 3 and the Unit 4 spent fuel pool. Specifically, it assumed 30 percent core damage at Units 2 and 3, and 100 percent fuel damage for the Unit 4 spent fuel pool. The Unit 4 spent fuel pool was assumed to include only a full core offload from the current outage. To account for the combined inventories of the three units sources (i.e., from Units 2 and 3 and Unit 4 spent fuel pool), the staff adjusted the reactor power level, fuel burn up and number of assemblies, and included that in one calculation. This resulted in 917 assemblies in the core. (I do not understand that last sentence. If it read cores (plural) it might make sense)

The assumptions included total failure, sprays off, no removal mechanism (e.g., scrubbing), no mitigation by the operator. The meteorological conditions for the second assessment also assumed actual conditions with light precipitation, fairly stable wind conditions with occasional higher wind speeds and less stable atmospheric conditions, resulting in greater atmospheric dispersion. A ground level release was assumed with release duration of 15 hours.

What is the bottom line? Just like we would do here in the US, we issued a prudent precaution for potential exposures that was based on the information we had at the time and its reliability. Unfortunately there has since been public reporting that actual dose readings out to 30 kilometers in Japan have shown levels that exceed our protection action guidelines here in the US. Therefore the 50-mile evacuation is no longer just a prudent precaution based on what could happen, but has proved to be a necessary step based on the tragic situation that has unfolded so far.

Eliot Brenner
Public Affairs Director

From: Doane, Margaret
Sent: Sunday, March 20, 2011 9:38 AM
To: Schwartzman, Jennifer; Mamish, Nader
Cc: LIA03 Hoc; LIA02 Hoc
Subject: Fw: Info from CA Briefing 20 March 2011
Attachments: March 20 one pager.doc

Nader, I thought I read that Areva was sending protection gear and some other things. At the bottom of this document there is a request for gear. Would they need more or should we track down the Areva shipment first before sending more. Also we would need to verify I'm right about Areva.

Sent from an NRC Blackberry
Margaret Doane

From: LIA01 Hoc
To: Andersen, James; Bates, Andrew; Brenner, Eliot; Bubar, Patrice; Camper, Larry; Castleman, Patrick; Chandrathil, Prema; Cheok, Michael; Dembek, Stephen; Doane, Margaret; Dricks, Victor; Franovich, Mike; Gott, William; Haney, Catherine; Hannah, Roger; Hart, Ken; Hayden, Elizabeth; Hipschman, Thomas; Howell, Linda; Jackson, Donald; Ledford, Joey; Lewis, Robert; Mamish, Nader; Marshall, Michael; Maupin, Cardelia; McConnell, Keith; Miller, Charles; Mitlyng, Viktoria; Moore, Scott; Nease, Rebecca; Nieh, Ho; Orders, William; Powell, Amy; Ramsey, Jack; Reddick, Darani; Reis, Terrence; Riemer, Kenneth; Screnci, Diane; Sheehan, Neil; Snodderly, Michael; Sollenberger, Dennis; Sosa, Belkys; Tschiltz, Michael; Uselding, Lara; Vietti-Cook, Annette; Whitney, James; McKenney, Christopher
Sent: Sun Mar 20 09:15:11 2011
Subject: Info from CA Briefing 20 March 2011

From: Brenner, Eliot
To: Harrington, Holly
Subject: FW: blog i mentioned
Date: Tuesday, March 22, 2011 4:15:38 PM

Please weave this in, resend to me, and I will ship it upstairs.

eliot

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Sent: Tuesday, March 22, 2011 4:13 PM
To: Brenner, Eliot
Subject: RE: blog i mentioned

Let's edit this with the message with this idea and then show him:

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Subject: blog i mentioned

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Here is what they say:

RRRR-306

Both assessments are hypothetical, stylized analyses of consequences of releases from the Fukushima nuclear power plant Units 2, 3 and 4. WHAT HAPPENED WITH UNIT 1 IN THESE CALCULATIONS?

The first assessment assumed release from one reactor unit, specifically Unit 2. It assumed all fuel melted and escaped from the reactor core, that containment failed, and it used actual meteorological conditions during early morning hours. The low dispersion characteristics included low wind speeds, relatively stable air, and light precipitation.

The assessment considered the conditions of the plant at the time and possible degrading conditions. The assumptions included total failure, sprays off, no removal mechanism (e.g., scrubbing), no mitigation by the operator. A ground level release was assumed with release duration of 16 hours.

The second assessment represented multiple unit failures, in this case Units 2 and 3 and the spent fuel pool (SFP) of Unit 4. Specifically, it assumed 30 percent core damage at Units 2 and 3, and 100 percent fuel damage for the Unit 4 spent fuel pool. The Unit 4 spent fuel pool was assumed to include only a full core offload from the current outage. To account for the combined inventories of the three units sources (i.e., from Units 2 and 3 and Unit 4 spent fuel pool), the staff adjusted the reactor power level, fuel burn up and number of assemblies, and included that in one calculation. This resulted in 917 assemblies in the core. (I do not understand that last sentence. If it read cores (plural) it might make sense)

The assumptions included total failure, sprays off, no removal mechanism (e.g., scrubbing), no mitigation by the operator. The meteorological conditions for the second assessment also assumed actual conditions with light precipitation, fairly stable wind conditions with occasional higher wind speeds and less stable atmospheric conditions, resulting in greater atmospheric dispersion. A ground level release was assumed with release duration of 15 hours.

I hope this explanation is helpful.

Eliot Brenner
Public Affairs Director

From: Shoop, Undine
To: Harrington, Holly
Subject: RE: Assumed plant conditions supporting March 16, 2011 NRC press release.docx
Date: Tuesday, March 22, 2011 4:10:10 PM

Holly,

Looks good. John Lubinski was the ET person for the PMT in the ops center today and I know he was reviewing it but I don't know if the version that was sent to us was a draft version or the final version so I will defer to him on whether or not it was blessed.

One change: on the second line, I think it should be our instead of out.

Cheers,

Undine

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 2:56 PM
To: PMT03 Hoc; Shoop, Undine; Riley (OCA), Timothy
Subject: RE: Assumed plant conditions supporting March 16, 2011 NRC press release.docx

Thank you all for this information. We decided it might be useful to make this a blog post, as there were many commenters to the blog who posed a similar question. Please see attached. I'm assuming this was blessed by whomever needed to? (PMT?)

We'll run this tomorrow.

From: PMT03 Hoc
Sent: Tuesday, March 22, 2011 1:10 PM
To: Shoop, Undine; Harrington, Holly; Riley (OCA), Timothy
Subject: Assumed plant conditions supporting March 16, 2011 NRC press release.docx

RRRR-307

From: [Newsfeed](#)
To: [Ulises, Anthony](#); [Taylor, Robert](#); [Trapp, James](#)
Subject: Fwd: Kyodo: Update1: Largest Aftershock Upsets Quake Victims in Northeastern Japan
Date: Thursday, April 07, 2011 10:38:52 PM

Guys

The fun never stops. This one was about like the one that had Tony and I under my table one night. No damage at my place. Rob my phone gave me 43 seconds warning and let me know it would be big. I was at my table and ready when it hit--about seven seconds early!!!

All in all a very cool technology.

Anyway thought you guys would enjoy the article below about the power failures at the other NPPs in the region.

Russ

Sent from my iPod
Please forgive terseness and typos :-)

Begin forwarded message:

From: OSCINFO@rccb.osis.gov
Date: April 8, 2011 10:47:49 AM GMT+09:00
Subject: **OSC: Kyodo: Update1: Largest Aftershock Upsets Quake Victims in Northeastern Japan**
Reply-To: OSCINFO@rccb.osis.gov

Note: The following OSC material is being emailed to you based on a subscription.

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Kyodo: Update1: Largest Aftershock Upsets Quake Victims in Northeastern Japan

JPP20110408969014 Tokyo Kyodo World Service in English 0137 GMT 08
Apr 11

RFR/308

[Computer selected and disseminated without OSC editorial intervention]

Sendai, April 8 Kyodo -- (EDS: ADDING NO. OF PEOPLE KILLED, INJURED AT LEAD, 4TH-5TH GRAFS, INFO AT BOTTOM) The strongest aftershock since the devastating March 11 temblor that jolted Miyagi Prefecture and its vicinity late Thursday night killed two people and injured 132, tallies by firefighters and police showed Friday, while upsetting residents already taking shelter at local facilities and resting in the dark at the time.

The 11:32 p.m. quake, with a preliminary magnitude of 7.4, measured upper 6 on the Japanese seismic intensity scale of 7 in northern and central parts of Miyagi Prefecture, the area hardest hit by last month's magnitude 9.0 quake.

Among nuclear power plants in the region, no abnormalities have so far been reported as a result of the quake at the crisis-hit Fukushima Daiichi or the nearby Fukushima Daini. Some external power supply, however, was disrupted at suspended plants and a spent fuel reprocessing plant in Miyagi and Aomori prefectures, causing them to use backup generators.

The Fire and Disaster Management Agency reported a death in Ishinomaki, Miyagi Prefecture and another in Obanazawa, Yamagata Prefecture.

The 132 people sustained either serious or minor injuries in the six prefectures of the Tohoku region in northeastern Japan as of 8 a.m., the National Police Agency said.

There were also emergency calls about fires and gas leakages, according to local police and fire departments, while the quake caused all expressways to be closed in Miyagi Prefecture and most train services to be suspended in the Tohoku region.

As of midnight Thursday, it had left some 3.64 million households without electricity in the six prefectures, including those already without power.

"There are no TVs or radios available due to the blackout. All of us are worried," said Takeo Sato, 70, who was among residents staying at a sports arena in the tsunami-ravaged Miyagi town of Minamisanriku, all of whom dashed outside when the quake struck.

At a public gymnasium in the town of Onagawa, power went down shortly after the latest quake, and firefighters guided people outside.

"I was surprised but the jolt was not as big as the one before. I'm rather worried about the sea," said Fumie Yoshida, 37, a worker at a supermarket store in Sendai where bottles of soft drinks and other products were scattered by the tremors. A tsunami warning was issued at one point but lifted early Friday.

The Hayate shinkansen train was halted by the quake in a tunnel in Aomori Prefecture, with 15 passengers aboard, but all were rescued unhurt early Friday, East Japan Railway Co. said, adding it will suspend most train services in the Tohoku region for checks in the morning.

More than a dozen passengers of another halted train walked along the railroad to a nearby crossing in Fukushima Prefecture, JR East said.

At the Onagawa nuclear plant in Miyagi Prefecture, which has been suspended, two external power supply units among three have failed, and power supply was also disrupted at the No. 1 reactor, which had been suspended for maintenance, of the Higashidori nuclear power station in Aomori Prefecture, requiring the use of backup generators, Tohoku Electric Power Co. said.

In Rokkasho, Aomori Prefecture, external power supply was disrupted at the spent nuclear fuel reprocessing plant of Japan Nuclear Fuel Ltd.

While strong aftershocks have continued since the March 11 quake, it was the first to register in the upper 6 on the Japanese seismic intensity scale.

The death toll from the main quake and the tsunami it triggered on March 11 was 12,690 in 12 prefectures as of 8 p.m. Thursday, while 14,736 remain missing and 4,224 were injured, the government police agency said.

[Description of Source: Tokyo Kyodo World Service in English -- English service of Japan's largest domestic and international news agency, owned by nonprofit cooperative of 63 newspaper companies and NHK]

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From: NEIGA@nei.org
To: [Hayden, Elizabeth](#)
Subject: **Update 1:15pm March 16** Information on the Japanese Earthquake and Reactors in that Region
Date: Wednesday, March 16, 2011 2:01:08 PM



UPDATE AS OF 1:15 P.M. EDT, WEDNESDAY, MARCH 16:

NEI has posted an updated version of the fact sheet [Used Nuclear Fuel Storage at the Fukushima Daiichi Nuclear Power Plant](#). Also available is a new fact sheet called [Industry Taking Action to Ensure Continued Safety at U.S. Nuclear Energy Plants](#).

As always, please go to <http://resources.nei.org/japan> for the latest updates.

Click [here](#) to unsubscribe



2222/309

David Decker

From: David Decker
Sent: Friday, March 11, 2011 12:53 PM
To: 'elizabeth_craddock@landrieu.senate.gov'
Subject: FW: Press Release: NRC Monitors Notice of Unusual Event at Diablo Canyon Power Plant, Tsunami Issues
Attachments: 11-042.docx

Liz,
Attached above for your information is an NRC press release regarding the tsunami issue in Japan, and NRC actions in response.

David Decker
NRC/Congressional Affairs
301-415-1693

PRR-310

From: [Harrington, Holly](#)
To: [Brenner, Eliot](#)
Subject: RE: EPZ Blog draft
Date: Tuesday, March 22, 2011 1:58:00 PM

Our friend Michael will facilitate

From: Brenner, Eliot
Sent: Tuesday, March 22, 2011 1:41 PM
To: Harrington, Holly
Subject: RE: EPZ Blog draft

Is there any value in checking that box? We will coordinate something in this organization until it is mush, and too late.

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 1:16 PM
To: Sheehan, Neil
Cc: Brenner, Eliot
Subject: RE: EPZ Blog draft

I can do this, but it will slow down its posting. Pls advise

From: Sheehan, Neil
Sent: Tuesday, March 22, 2011 12:20 PM
To: Harrington, Holly
Subject: FW: EPZ Blog draft

Any way to vet this with FEMA?

From: Dean, Bill
Sent: Tuesday, March 22, 2011 12:18 PM
To: Sheehan, Neil; Screnci, Diane
Cc: Lew, David
Subject: EPZ Blog draft

Here are a few potential edits. Assume we will vet with FEMA??

RRRR-311

DRAFT

Whether by virtue of regular testing of sirens, mailings about emergency plans or possibly the receipt of potassium iodide (KI) pills, there are frequent reminders for those who live within a 10-mile radius of a U.S. nuclear power plant of the need to be ready should a significant event occur at the facility.

This area is known as the Emergency Planning Zone (EPZ), and it is well established in federal regulations as the focal point of preparing for a severe accident at a reactor.

Some confusion has cropped up in the media and elsewhere recently regarding the size of EPZs in the wake of developments involving four of the six ~~the~~ Fukushima Daiichi reactors in Japan. The source of this confusion appears to stem from the U.S. Nuclear Regulatory Commission (NRC) advisory on March 16th for American citizens who were within 50 miles of the plant to evacuate: <http://pbadupws.nrc.gov/docs/ML1108/ML110800133.pdf>.

The advisory was based on calculations done by NRC experts indicating releases from the four hobbled Japanese plants could – and a key word there is *could* – possibly exceed conservatively set safe radiation-exposure limits for the public.

On its face, this recommendation seems to be at odds with the size used for American EPZs. In fact, it was consistent with the same kind of approach that would be used in the United States should a comparable, although extremely unlikely, event take place here.

In November 1976, a task force of NRC and Environmental Protection Agency (EPA) (?????NO FEMA INVOLVEMENT???) representatives was formed to look at salient emergency planning issues for U.S. nuclear power plants. Out of that comprehensive evaluation came a recommendation that a 10-mile-radius EPZ would assure that “prompt and effective actions can be taken to protect the public in the event of an accident” at a plant. This was based on research showing the most significant impacts of an accident would be expected in the immediate vicinity of a plant and therefore any initial protective actions, such as evacuations or sheltering in place, should be focused there. Put another way, the projected radiation levels would not be expected to exceed EPA protective action dose guidelines (1 to 5 rems) beyond 10 miles under most accident scenarios.

That does not mean the protective actions could not expand beyond the 10-mile radius. Rather, emergency planners have always known such actions could be ~~taken~~ necessary if the situation warranted it. Indeed, U.S. nuclear power plants are required to consider and drill for the possibility of radiation releases that could have impacts up to 50 miles away– ,in addition to the required biennial exercises conducted in the vicinity of each nuclear power plant to assess implementation of the emergency plan within the 10 mile EPZ. Once every six years, each plant

takes part in a graded exercise to demonstrate how it would handle such an event, which typically would involve such actions as placing cattle on stored feed and holding off on the harvesting of crops until readings indicated radiation levels were back to normal.

As a key NRC/FEMA report on emergency planning states, "In a particular emergency, protective actions might well be restricted to a small part of the planning zone. On the other hand, for the worst possible accidents, protective actions would need to be taken outside the planning zones."

The Japanese have been confronted with extremely challenging circumstances wrought by a record earthquake followed by a massive tsunami. As the NRC carefully monitored developments there, the agency used the best information available to it to make a protective action recommendation that was in response to a situation involving ~~several~~ multiple reactors and spent fuel pools experiencing significant cooling problems. Were a similar accident to occur in the U.S., the response would be guided by the same considerations. Once the salient facts regarding the events at Fukushima Daiichi are made clear to the NRC, it intends to assess its own regulations and practices for any pertinent lessons learned that can be applied here. This will include an assessment of current emergency planning guidance and policy.

More information on emergency planning for U.S. nuclear power plants is available on the NRC web site at: <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/fs-emerg-plan-prep-nuc-power.html> .

PRESS RELEASE



japan.usembassy.gov

米国大使館 報道室 PRESS OFFICE, U.S. EMBASSY, TOKYO TEL. 3224-5264/5266 FAX. 3586-3282

11-XXR

April X, 2011 XX:XX

U.S.-Japan Cooperation at the Fukushima Daiichi Nuclear Power Plant

In an integrated response that includes numerous U.S. Government agencies, the United States is working closely with Japan to support its efforts to respond to the ongoing nuclear emergency at the Fukushima Daiichi nuclear power plant. Reflecting on this, Ambassador John Roos said "the tireless efforts of all those involved, both Japanese and American, are yet another prime example of the enduring strength of our bilateral alliance."

- The United States stands by the people of Japan as they recover and rebuild from the earthquake and tsunami disasters. As President Obama said, "We will stand with the people of Japan as they contain this crisis, recover from this hardship, and rebuild their great nation." Through our whole of government response, the USG is best able to provide the expertise across numerous fields to support our friend and ally, Japan.
- Immediately after the March 11 earthquake, a team of experts from the Nuclear Regulatory Commission (NRC) and the Departments of Energy and of Health and Human Services came to Japan to help the Government of Japan assess and address the damage at Fukushima Daiichi. The NRC, which has maintained a long working relationship with its regulatory counterpart, the Japanese Nuclear and Industrial Safety Agency (NISA) over many years, established a daily dialogue with NISA about the status of the Fukushima Daiichi plant's reactors, and related concerns.
- An NRC team of subject matter experts on reactor safety, protective measures and international relations has been stationed in Tokyo since March 13. The team is being supported by additional experts working in the NRC Headquarters Operations Center near Washington, D.C. Approximately 30 such experts have been in Tokyo, working with their NISA counterparts and meeting with officials from the Japan Atomic Energy Agency, Tokyo Electric Power Company (TEPCO), the Ministry of Economy, Trade and Industry (METI), the Ministry of Education, Culture, Sports, Science and Technology (MEXT), and the Ministry of Foreign Affairs (MOFA).
- The United States is providing technical assistance and equipment as requested by the Government of Japan. This assistance includes:
 - Deployment of DOE ground and aerial radiation monitoring teams with special analytical capabilities for characterizing and assessing radiation deposits outside the Fukushima Daiichi site. Daily flights using two helicopters and an airplane operated by the U.S. Air Force track the extent of ground contamination and support response and recovery efforts. To date 262 hours of flying time has been logged and the monitoring data is being shared with various Japanese ministries to help them better understand the impact of the incident. Monitoring data are also posted on the DOE website at www.energy.gov.

RRRR/312

- Joint monitoring priorities to ensure maximum coverage of the affected area are determined with Japan's Nuclear Safety Commission. Joint aerial monitoring utilizing U.S. and Japanese aircraft enable both sides to gather more precise data. Since April 6, there have been seven such flights.
- Joint U.S. and Japan-operated fixed monitoring stations and deployed teams, which have accumulated over 100,000 field measurements.
- A high pressure water pumping system transported to Japan with the help of the Australian Air Force and U.S. Forces Japan. Together with two barges of fresh water (carrying a total of 500,000 gallons) shipped from the U.S. Navy Base in Yokosuka, the pumps are inserting fresh water to cool fuel rods in the Fukushima Daiichi reactors.
- Transporting scores of agricultural soil samples to DOE laboratories in the U.S. for analysis for strontium and cesium contamination.
- Delivery of germanium testing units to various GOJ ministries to augment their testing capability of food and water for radiological contamination.
- Collaboration between NRC and NOAA scientists with their Japanese counterparts to model radiation migration in the ocean waters off Fukushima.
- Cooperation between National Cancer Institute and FDA specialists with their Japanese counterparts to determine the uptake rates of radioactive isotopes by key agricultural crops, starting with rice.
- Two fire engines provided by U.S. Forces Japan, among the first such vehicles to arrive at Fukushima Daiichi after the earthquake and tsunami, were immediately used to spray water at the damaged reactors.
- Utilization of the Department of Energy's diverse resources and the capabilities of its national laboratories to develop potential solutions in support of Japanese responders at Fukushima Daiichi.
- Two experts from Pacific Northwest National Laboratory have been providing a wide range of technical support and analysis at TEPCO headquarters, at the request of the Japanese government.
- Two experts from Sandia National Laboratories are also in Tokyo providing technical and analytical support to characterize the extent of reactor damage and radioactive releases at Fukushima Daiichi.
- From the Idaho National Laboratory, DOE provided a customized robot, radiation sensor kits, radiation hardened cameras, and a GammaCam for video and radiation mapping at Fukushima Daiichi. Other robotic and remote control technology support, plus shielding for Japanese equipment to be used for debris removal at the site, are under discussion.
- From DOE's Savannah River Site, five large stainless steel tanks are being shipped to Japan for storage of radiated water. A modified tractor trailer with a shielded tank that will allow for contaminated water characterization is also en route.

Comment [P1]: The Japanese?

- Under the direction of the Cabinet Secretariat, U.S. experts and their Japanese counterparts regularly discuss priority issues and needed assistance. Working together, the experts review scientific and technical data, leading to solutions of the problems at Fukushima.
- To underscore America's support, NRC Chairman, Dr. Gregory Jaczko, traveled to Tokyo on March 28, when he pledged further cooperation. Dr. Peter Lyons, Acting Assistant Secretary for Nuclear Energy at the Department of Energy, visited Tokyo from April 5-8 on a fact-finding mission and to meet with TEPCO and other industry representatives. In his meetings with Japanese Government officials, he promoted additional bilateral information sharing.
- A Medical Task Force which included experts from the Department of Health and Human Services and the Centers for Disease Control and Prevention and representatives of Japanese government agencies, consulted in three working groups: A modeling group examined health effects based on radiation exposure; a potassium iodide (KI) group discussed the dose regimen for using KI when it is indicated; and the risk communication group reviewed strategies for presenting information to the public.

#

Drafted: Embassy Tokyo

Approved: EAP/FO PDAS Donovan ok (previous version)

Cleared:

(Embassy Tokyo – this version)

AEX: SMorimura	ok
HHS: NColeman	ok
DOE: RCherry	ok
NRC: EStahl	ok
USF A: GWiggin	ok

(Washington – previous version)

D(S): CMace	ok
P: NLeou	ok
S/P: TJung	ok
C: CKlevorick	ok
M: PPetrovich	ok
L/EAP: RHarris	ok
L/NPV: JHerr	ok
PA: BChang	ok
EAP/J: CGreen	ok
EAP/P: DTParadiso	ok
EAP/EX	info
CA/P	info

NRC: EBrenner	ok (this version)
DOE: DLavera	ok (this version)
OSD: LHullRyde	ok (this version)
HHS	ok
CDC: BBurden	ok

USAID: GJackson	ok
EPA: BGilfillan	ok
DHS: AKudwa	ok
NSS	info by request

From: Harrington, Holly
To: Sheehan, Neil
Cc: Brenner, Eliot
Subject: RE: EPZ Blog draft
Date: Tuesday, March 22, 2011 1:52:00 PM

PMT recommends it. I'll try to speed through it

From: Sheehan, Neil
Sent: Tuesday, March 22, 2011 1:52 PM
To: Harrington, Holly
Cc: Brenner, Eliot
Subject: RE: EPZ Blog draft

I figured as much. Let me remind Bill of the realities of the situation.

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 1:16 PM
To: Sheehan, Neil
Cc: Brenner, Eliot
Subject: RE: EPZ Blog draft

I can do this, but it will slow down its posting. Pls advise

From: Sheehan, Neil
Sent: Tuesday, March 22, 2011 12:20 PM
To: Harrington, Holly
Subject: FW: EPZ Blog draft

Any way to vet this with FEMA?

From: Dean, Bill
Sent: Tuesday, March 22, 2011 12:18 PM
To: Sheehan, Neil; Screnci, Diane
Cc: Lew, David
Subject: EPZ Blog draft

Here are a few potential edits. Assume we will vet with FEMA??

RRRR-313

From: Burnell, Scott
To: Brenner, Eliot; Hayden, Elizabeth; Harrington, Holly; McIntyre, David; Couret, Yvonne; Janbergs, Holly; Screnci, Diane; Sheehan, Neil; Hannah, Roger; Ledford, Joey; Chandrathil, Prema; Mitlyng, Viktoria; Dricks, Victor; Uselding, Lara
Subject: Guidance on reporter queries involving Sandia Natl. Labs
Date: Tuesday, March 22, 2011 1:52:00 PM

Folks;

NNSA gave us a call and said reporters interested in Sandia-generated NRC reports are being referred to SNL by OPA folks. The reporters are likely fibbing, but just to be clear:

Any calls about Sandia stay here at HQ and will go through RES -- The folks at Sandia who do NRC work are currently engaged in supporting the NRC response to Japan and will not be available to discuss reports.

The specific report that generated the questions – NUREG/CR-6906 – talks about containment pressure tests done on scale models of several containment types, but not the BWR Mark I. The results suggest the containments are stronger than expected and can withstand much higher accident pressures than they're designed for.

The report HAS NO BEARING on the criticism that Mark I containments would fail if the reactor vessel is breached, so don't go there. Thanks.

Scott

RRRR-314

David Decker

From: David Decker
Sent: Friday, March 11, 2011 12:50 PM
To: Shane, Raeann; Powell, Amy; Schmidt, Rebecca; Weil, Jenny; Quesenberry, Jeannette; Belmore, Nancy
Subject: RE: 12:30 EST Update on Facility Status from Region IV

Thanks Raeann. I think Amy took the last call on the tsunami topic earlier today. Since then I haven't had any. Maybe the press release info is helping cut that down?

From: Shane, Raeann
Sent: Friday, March 11, 2011 12:49 PM
To: Powell, Amy; Schmidt, Rebecca; Decker, David; Weil, Jenny; Quesenberry, Jeannette; Belmore, Nancy
Subject: FW: 12:30 EST Update on Facility Status from Region IV
Importance: High

Latest from RIV. Conference call with the Chairman is now at 1:00 on the ET bridge. Have you guys been getting any calls from the Hill? I have not sent any updates out from here.

From: LIA12 Hoc
Sent: Friday, March 11, 2011 12:43 PM
To: Shane, Raeann
Subject: FW: 12:30 EST Update on Facility Status from Region IV
Importance: High

From: LIA01 Hoc
Sent: Friday, March 11, 2011 12:41 PM
To: LIA04 Hoc; LIA02 Hoc; LIA12 Hoc; LIA11 Hoc; LIA07 Hoc
Subject: FW: 12:30 EST Update on Facility Status from Region IV
Importance: High

From: Howell, Linda
Sent: Friday, March 11, 2011 12:40 PM
To: HOO Hoc; LIA01 Hoc
Cc: Wright, Ned
Subject: 12:30 EST Update on Facility Status from Region IV
Importance: High

Attached is an update for the chairman's use and for the Liaison Team.

RRR- 315

David Decker

From: Shane, Raeann
Sent: Friday, March 11, 2011 12:37 PM
To: Schmidt, Rebecca; Powell, Amy; Quesenberry, Jeannette; Weil, Jenny; Decker, David; Belmore, Nancy
Subject: FW: Japan Update: Water levels at Fukushima; Onagawa fire extinguished

fyi

From: LIA12 Hoc
Sent: Friday, March 11, 2011 12:35 PM
To: Shane, Raeann
Subject: FW: Japan Update: Water levels at Fukushima; Onagawa fire extinguished

From: HOO Hoc
Sent: Friday, March 11, 2011 12:31 PM
To: LIA04 Hoc; LIA02 Hoc; LIA12 Hoc; LIA01 Hoc; LIA11 Hoc
Subject: FW: Japan Update: Water levels at Fukushima; Onagawa fire extinguished

From: Breskovic, Clarence
Sent: Friday, March 11, 2011 12:26 PM
To: Breskovic, Clarence
Subject: Japan Update: Water levels at Fukushima; Onagawa fire extinguished

Update9: 3,000 Ordered To Evacuate Near Quake-hit Fukushima Nuclear Plant

Tokyo, March 12 Kyodo -- (EDS: ADDING FIRE EXTINGUISHED AT ONAGAWA PLANT) Japan declared a state of atomic power emergency Friday after the country, which has about 50 nuclear power reactors, was hit by a magnitude 8.8 earthquake, instructing around 3,000 residents near the Fukushima No. 1 plant to evacuate.

Top government spokesman Yukio Edano told an evening press conference, "We have a situation where one of the reactors (of the plant) cannot be cooled down." But the chief Cabinet secretary said the evacuation instruction was only precautionary.

Edano said, "No radiation has leaked outside the reactor. The incident poses no danger to the environment at the moment." He also said early Saturday in Tokyo the incident was under control.

The post-quake situation prompted the Vienna-based International Atomic Energy Agency to scramble for details from contacts in Japan's industry ministry, while saying in a statement that at least four nuclear power plants "closest to the quake have been safely shut down" after the 2:46 p.m. quake.

Tokyo Electric Power Co., the operator of the Fukushima plant, reported that the water level around fuel rods was falling in the reactor. Radioactive materials could be emitted if part of a fuel rod is exposed to the air.

But officials of the prefectural government dismissed the view that the plant is in a critical situation, saying the top of the water is 3.4 meters above the fuel rods at the troubled No. 2 reactor.

The evacuation advisory was issued for people living within a 3-kilometer radius of the plant, while those living within a

ERRR-316

10-kilometer radius were asked to stay home, Edano said.

Prime Minister Naoto Kan declared the emergency, the first in the quake-prone country, so that authorities can easily implement emergency relief measures, Edano said. Defense Minister Toshimi Kitazawa ordered the Self-Defense Forces to act in response to the declaration.

The Defense Ministry dispatched a chemical corps of the Ground Self-Defense Force to the plant and Motohisa Ikeda, senior vice industry minister, also left for Fukushima by an SDF helicopter.

According to the industry ministry, a total of 11 nuclear reactors automatically shut down at the Onagawa plant, the Fukushima No. 1 and No. 2 plants and the Tokai No. 2 plant after the strongest recorded earthquake in the country's history.

A fire started at a building housing the turbine of the Onagawa plant in Miyagi at 3:30 p.m. but was put out before 11 p.m., the operator, Tohoku Electric Power Co., said, denying it had detected any signs of radiation leaks.

Water spilled from pools containing fuel rods at the Kashiwazaki-Kariwa plant on the Sea of Japan coast in Niigata Prefecture and the Onagawa plant, the operators said, saying they saw no signs suggesting radiation leaks.

From: Cherry, Ronald C
To: JapanEmbassy, TaskForce; Angelov, Bonnie A; Alexander, Kathleen J
Cc: Alan Remick; Aleshia Duncan; Duncan, Aleshia D; Trapp, James; James Trapp (BB); Mears, Jeremy M; Morales, Russell A; Nesheiwat, Julia; Tamada, Yoshimi; Ulses, Anthony; Uchida, Koichi
Subject: RE: Nuclear Team Schedule, March 16
Date: Tuesday, March 15, 2011 6:59:50 PM

Ron Cherry has taken over from Aleshia Duncan.

Jim Trapp (NRC) and Alan Remick (DOE) are working in Room 4037.

The DOE monitoring team arrived last night and is staging its equipment at Yokota.

The additional NRC group arrives at NRT this afternoon.

Ron

This email is UNCLASSIFIED.

From: Cherry, Ronald C
Sent: Tuesday, March 15, 2011 10:25 PM
To: JapanEmbassy, TaskForce; Angelov, Bonnie A; Alexander, Kathleen J
Cc: Alan Remick; Aleshia Duncan; Duncan, Aleshia D; James Trapp; James Trapp (BB); Mears, Jeremy M; Morales, Russell A; Nesheiwat, Julia; Tamada, Yoshimi; Tony Ulses; Uchida, Koichi
Subject: Nuclear Team schedule

All:

Aleshia is on duty until 7 am tomorrow, when I will take over again.

Jim Trapp is still in a meeting upstairs (I think). Then the plan had been for him to get some rest and come back around 5 am.

Tony Ulses will be at the Embassy between 11 and 1 am.

Al Remick will come to the Embassy at 1 am.

Russ Morales is on call.

Also:

The DOE Airborne Monitoring team is arriving tonight around 1 am at Yokota. After the team has processed in, ONE member of the team will be brought directly to the Embassy. Both Aleshia and Alan Remick are aware.

Good night.

Ron

RRRR / 317

This email is UNCLASSIFIED.

From: Harrington, Holly
To: LIA03 Hoc
Subject: RE: bios for travelers
Date: Tuesday, March 22, 2011 1:14:00 PM

.We would appreciate having them just in case they are useful. thanks

From: LIA03 Hoc
Sent: Tuesday, March 22, 2011 11:01 AM
To: Harrington, Holly; Mamish, Nader
Subject: bios for travelers

To whom do we send the bios for Japan travelers? We have bios for everyone in the second wave of travelers, except Alan Blamey (already in flight) and Jack Ramsey.

RRRR-318

From: Brenner, Eliot
To: Harrington, Holly
Subject: RE: bios for travelers
Date: Tuesday, March 22, 2011 12:25:07 PM

Keep them handy in case we end up doing interviews.

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 11:12 AM
To: Brenner, Eliot
Subject: FW: bios for travelers

Any reason that we would want these bios?

From: LIA03 Hoc
Sent: Tuesday, March 22, 2011 11:01 AM
To: Harrington, Holly; Mamish, Nader
Subject: bios for travelers

To whom do we send the bios for Japan travelers? We have bios for everyone in the second wave of travelers, except Alan Blamey (already in flight) and Jack Ramsey.

RRRR-319

From: Mamish, Nader
To: LIA03 Hoc
Cc: Harrington, Holly
Subject: RE: bios for travelers
Date: Tuesday, March 22, 2011 12:23:07 PM
Attachments: Transition Update - Tuesday March 15 - 3pm Shift Change.msg

Bois should go to MOFA (see Item 7 in the attached). Not sure whether Jack is going. Margie is deciding ...

From: LIA03 Hoc
Sent: Tuesday, March 22, 2011 11:01 AM
To: Harrington, Holly; Mamish, Nader
Subject: bios for travelers

To whom do we send the bios for Japan travelers? We have bios for everyone in the second wave of travelers, except Alan Blamey (already in flight) and Jack Ramsey.

RRRR-320

Attachment Transition Update - Tuesday March 15 - 3pm Shi.msg (2560 Bytes) cannot be converted to PDF format.

From: PMT03 Hoc
To: Harrington, Holly
Cc: Hoc, PMT12
Subject: Information on emergency planning in the U.S.
Date: Tuesday, March 22, 2011 10:54:28 AM
Attachments: Information on emergency planning in the US.docx

Holly:

Per your request to Kathryn Brock (PMT), attached is the subject information. Should you have questions, please contact Kathryn at PMT12.hoc@nrc.gov, or 301-816-5415.

Prosanta Chowdhury
PMT Coordinator
301-816-5407

RRRR-321

Information on emergency planning in the U.S.

- For domestic events, licensees are responsible for making protective action recommendations (PAR) based on plant conditions and/or dose projection, and emergency plans in place. The State then makes a protective action decision (PAD) to either use the licensee's PAR or to make their own decision. NRC monitors the PAR and the PAD.
- Each licensee has their own emergency procedures; however, most start with a 2-mile radius and 5-mile downwind evacuation. Some licensees recommend initial evacuation out to 10 miles, depending on plant conditions. Dose projections requiring PARs beyond 10 miles are provided to the States for PADs beyond 10 miles. Emergency planning zones are meant to be expanded, as necessary, depending on plant conditions. NRC believes this emergency preparedness basis is appropriate.
- In the US, the NRC has access to plant data via the ERDS network and can easily obtain plant data that may be used in RASCAL calculations to make evaluations of realistic protective actions. In addition, NRC has a detailed understanding of plant design for US plants and would not have to make assumptions, as was done for the Japanese plants and spent fuel pools.
- On March 16th the NRC recommended that American residents within 50 miles of the Fukushima reactors in Japan evacuate. This was based on extremely limited data from Japan that was used to develop two dose assessments using RASCAL. As discussed in the press release, this was based on system conditions for a hypothetical single reactor site (source terms were combined) and is not representative of an actual release.
- If these exact conditions occurred in the US, the State would have made a PAD and the NRC would have expected it to be similar to the PAR issued by NRC in this event. However, if this event were in the US, the NRC would have realistic data from the licensee and would not have to rely on hypothetical and overly conservative assumptions.

From: Harrington, Holly
To: Brenner, Eliot
Subject: blog post for this morning
Date: Tuesday, March 22, 2011 9:59:00 AM

New Postings on NRC.Gov

I wanted to draw attention to some important information just released on the NRC website related to our response efforts and the Japanese nuclear emergency.

A transcript for the public commission meeting held yesterday has been posted. The meeting included an overview of NRC actions related to the Japanese emergency and the possible short and long-term activities for the NRC was just posted. The transcript can be found here: <http://www.nrc.gov/reading-rm/doc-collections/commission/recent/2011/> . And the slides from the meeting are located here: <http://www.nrc.gov/reading-rm/doc-collections/commission/slides/2011/20110321/staff-slides-03212011-meeting-rev1.pdf> .

Chairman Jaczko gave opening remarks at the meeting. He said, in part, "We have a responsibility to the American people to undertake a systematic and methodical review of the safety of our own domestic nuclear facilities, in light of the natural disaster and the resulting nuclear emergency in Japan. Beginning to examine all available information is an essential part of our effort to analyze the event and understand its impact on Japan and implications for the United States. Our focus is always on keeping plants and radioactive materials in this country safe and secure."

A copy of his full opening remarks can be found here: <http://www.nrc.gov/reading-rm/doc-collections/news/2011/11-054.pdf> .

We've also pulled together important documents and links related to the Japanese nuclear emergency onto one page on our home page. That page is available from the home page or directly here: <http://www.nrc.gov/japan/japan-info.html> .

Eliot Brenner
Public Affairs Director

RRRR-322

From: Sheehan, Neil
To: Harrington, Holly
Subject: RE: Transcript for yesterday's meeting
Date: Tuesday, March 22, 2011 9:52:08 AM

Very helpful. Thanks

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 9:34 AM
To: Brenner, Eliot; Burnell, Scott; Couret, Ivonne; Hayden, Elizabeth; McIntyre, David; Chandrathil, Prema; Dricks, Victor; Hannah, Roger; Ledford, Joey; Mitlyng, Viktoria; Screnci, Diane; Sheehan, Neil; Uselding, Lara
Subject: Transcript for yesterday's meeting

And available here: <http://www.nrc.gov/reading-rm/doc-collections/commission/recent/2011/>

RRRR-323

From: Hayden, Elizabeth
To: Harrington, Holly
Subject: RE: Transcript
Date: Tuesday, March 22, 2011 9:38:42 AM

done

*Beth Hayden
Senior Advisor
Office of Public Affairs
U.S. Nuclear Regulatory Commission
--- Protecting People and the Environment
301-415-8202
elizabeth.hayden@nrc.gov*

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 9:35 AM
To: Hayden, Elizabeth; Brenner, Eliot
Subject: Transcript

Do we want to link the transcript or post it on the japan page?

I can do a short blog post linking to it and the chairman's statement – or wait until the press release on the vote goes out and combine both subjects into one post . . .

RRRR-324

From: [Brenner, Eliot](#)
To: [Harrington, Holly](#)
Subject: RE: Transcript
Date: Tuesday, March 22, 2011 9:42:23 AM

Do the blog post and link both the statement and transcript to the blog.

Not sure when vote will come out

We can put up this guy's rebuttal, it's going to be so far down the list no one will see it, and I am going to write him a separate note.

eliot

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 9:35 AM
To: Hayden, Elizabeth; Brenner, Eliot
Subject: Transcript

Do we want to link the transcript or post it on the japan page?

I can do a short blog post linking to it and the chairman's statement – or wait until the press release on the vote goes out and combine both subjects into one post . . .

RRRR-325

From: [Harrington, Holly](#)
To: [Shoop, Undine](#)
Subject: any idea of how to respond to this?
Date: Tuesday, March 22, 2011 9:29:00 AM

Hello. Could you please explain why the dose values listed in the pdf for the one reactor site are generally greater than the dose values for the four reactor site?

I plotted them here...

http://groups.yahoo.com/group/Know_Nukes/attachments/folder/1723901577/item/1862364145/view

Also, what are the exposure time periods used. I see it says four days of groundshine?

Thank you.

RRRR-326

David Decker

From: David Decker
Sent: Friday, March 11, 2011 12:16 PM
To: 'bridget_petruczok@boxer.senate.gov'; jennifer_tang@boxer.senate.gov;
'hilary_pearson@boxer.senate.gov'; 'matthew_nelson@feinstein.senate.gov';
'shelly_abajian@feinstein.senate.gov'; 'sarah_moffat@feinstein.senate.gov';
jonathan.levenshus@mail.house.gov; greg.haas@mail.house.gov; 'Lombardi, Kyle';
'mike.whiteford@mail.house.gov'; 'richard.mereu@mail.house.gov';
john_watts@feinstein.senate.gov; 'maria.bowie@mail.house.gov';
'jolyn.murphy@mail.house.gov'; 'shawna.rimke@mail.house.gov';
'molly.boyl@mail.house.gov'; 'phil.paule@mail.house.gov'
Subject: Press Release: NRC Monitors Notice of Unusual Event at Diablo Canyon Power Plant,
Tsunami Issues
Attachments: 11-042.docx

Attached above for your information is an NRC press release that just came out regarding the tsunami issue in Japan, and NRC actions in response.

David Decker
NRC/Congressional Affairs
301-415-1693

RRR-327

2

Cohen, Shari

From: Leeds, Eric
Sent: Friday, March 11, 2011 7:58 AM
To: 'Lawrence.BURKHART@oecd.org'
Subject: RE: [Yama] Evacuation order to residents

Thanks, Larry. Was not aware of the evacuation. I wonder what prompted it? We're having a call in 5 minutes – if we get any good info, I'll send an email. Again really appreciate the info and hope to see you in Paris in June!

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

release

From: Lawrence.BURKHART@oecd.org [mailto:Lawrence.BURKHART@oecd.org]
Sent: Friday, March 11, 2011 7:54 AM
To: Leeds, Eric
Subject: FW: [Yama] Evacuation order to residents

Dear Eric,

Im sure you all are very busy there following the situation. Here is the latest from Yama – Im not sure exactly what their State of Emergency means but they are evacuating people as below (but only within 2 km).

Regards. Larry

From: Akihiro YAMAMOTO [mailto:a-yamamoto@houshasen.tsuruga.fukui.jp]
Sent: Friday, March 11, 2011 13:41
To: 'Akihiro YAMAMOTO'; GAUVAIN Jean, NEA/SURN
Cc: REIG Javier, NEA/SURN; ECHAVARRI Luis, NEA; YOSHIMURA Uichiro, NEA/SURN; GAS Serge, NEA/RE; BREEST Axel, NEA/SURN; MAUNY Elisabeth, NEA/SURN; LAMARRE Greg, NEA/SURN; REHACEK Radomir, NEA/SURN; HUERTA Alejandro, NEA/SURN; JACKSON Diane, NEA/SURN; GAUVAIN Jean, NEA/SURN; NAKOSKI John, NEA/SURN; GRESS Philippe, NEA/SURN; BURKHART Lawrence, NEA/SURN; 'Carlo Vitanza'; AMRI Abdallah, NEA/SURN
Subject: [Yama] Evacuation order to residents

The people of a town near Fukushima Daiichi Units (Within 2 km) were ordered to evacuate their homes.

RRRR-328

I was mentioned previous emails with regard to ECCS but I think this is very strange that ECCS are really being driven even diesel generators has failed to start.

Please correct that following plants are just in the emergency mode and not in the ECCS mode.

Fukushima 1-1 - State of emergency

Fukushima 1-2 - **Call off the emergency**

Fukushima 1-3 - State of emergency

Fukushima 2-1 - State of emergency

Fukushima 2-2 - State of emergency

Fukushima 2-4 - State of emergency

-

Yama

+++++

Akihiro YAMAMOTO

Ageing Management Specialist,

Nuclear Safety Measurement Division

Fukui Prefectural Government

Telephone: +81 (0) 776 20 0314

E-mail: a-yamamoto@houshasen.tsuruga.fukui.jp

+++++

From: Akihiro YAMAMOTO [mailto:a-yamamoto@houshasen.tsuruga.fukui.jp]

Sent: Friday, March 11, 2011 8:00 PM

To: 'Akihiro YAMAMOTO'; Jean.GAUVAIN@oecd.org

Cc: Javier.REIG@oecd.org; Luis.ECHAVARRI@oecd.org; Uichiro.YOSHIMURA@oecd.org; Serge.GAS@oecd.org;

Axel.BREEST@oecd.org; Elisabeth.MAUNY@oecd.org; Greg.LAMARRE@oecd.org; Radomir.REHACEK@oecd.org;

Alejandro.HUERTA@oecd.org; Diane.JACKSON@oecd.org; Jean.GAUVAIN@oecd.org; John.NAKOSKI@oecd.org;

Philippe.GRESS@oecd.org; Lawrence.BURKHART@oecd.org; 'Carlo Vitanza'; Abdallah.amri@oecd.org

Subject: [Yama] Situation update (19:45 Japan time)

NISA is now holding a press conference.

Fukushima 1-1 (ECCS mode)

Fukushima 1-2 (ECCS mode) - **Call off the emergency**

Fukushima 1-3 (ECCS mode)

Fukushima 2-1 (ECCS mode)

The problem is that they can't monitor water injection (ECCS).

It might be a problem of the monitoring system.

In fact, TEPCO called off the emergency of unit 1-2 a while ago because they are able to monitoring the water level in the reactor now.

Yama

+++++

Akihiro YAMAMOTO

Ageing Management Specialist,

Nuclear Safety Measurement Division

Fukui Prefectural Government

Telephone: +81 (0) 776 20 0314

E-mail: a-yamamoto@houshasen.tsuruga.fukui.jp

+++++

From: Akihiro YAMAMOTO [mailto:a-yamamoto@houshasen.tsuruga.fukui.jp]

Sent: Friday, March 11, 2011 7:30 PM

To: 'Jean.GAUVAIN@oecd.org'

Cc: 'Javier.REIG@oecd.org'; 'Luis.ECHAVARRI@oecd.org'; 'Uichiro.YOSHIMURA@oecd.org'; 'Lydie.GUYOT@oecd.org'; 'Marie-Laure.PEYRAT@oecd.org'; 'Serge.GAS@oecd.org'; 'Axel.BREEST@oecd.org'; 'Elisabeth.MAUNY@oecd.org'; 'Greg.LAMARRE@oecd.org'; 'Radomir.REHACEK@oecd.org'; 'Alejandro.HUERTA@oecd.org'; 'Diane.JACKSON@oecd.org'; 'Jean.GAUVAIN@oecd.org'; 'John.NAKOSKI@oecd.org'; 'Philippe.GRESS@oecd.org'; 'Lawrence.BURKHART@oecd.org'; 'Nicolina.IANNOLO@oecd.org'; 'Roopa.CHAUHAN@oecd.org'; 'christele.tephanympnia@oecd.org'; 'Aileen.LITTLE@oecd.org'; 'Carlo Vitanza'; 'Abdallah.amri@oecd.org'

Subject: [Yama] Situation now - ECCS mode

Dear all,

TEPCO (Tokyo Electric Power Company) declared the state of emergency of following NPPs:

Fukushima 1-1

Fukushima 1-2

Fukushima 1-3

Fukushima 2-1 **(ECCS mode now)**

I am trying to get information why DG can't start up (problem of intake sea water for the cooling DG system?)

There is a fire from turbine building (B1 floor) at Onagawa NPP unit 1 but the fire fighting was completely succeeded.

<http://www.yomiuri.co.jp/dy/national/20110311dy01.htm>

A while ago, Fukui (my office located) had also earthquake (M4.1). We have 15 NPPs but no damage to the NPPs.

Yama

+++++

Akihiro YAMAMOTO

Ageing Management Specialist,

Nuclear Safety Measurement Division

Fukui Prefectural Government

Telephone: +81 (0) 776 20 0314

E-mail: a-yamamoto@houshasen.tsuruga.fukui.jp

+++++

From: Jasinski, Robert
To: Collins, Frank; Alexander, Ryan; Billings, Sally; Burgess, Michele; Byrd, Calvin; Carter, Rozier; Christoffer-Baruch, Gail; Dickson, Billy; Fitzgerald, Rebecca; Golla, Joe; Harrington, Holly; Hinson, Felicia; Howell, Linda; Jefferson, Steven; Kowalczyk, Jeffrey; Kozal, Jason; Lazar, Carol; Lyons-Burke, Kathy; Marshall, Jane; McKinley, Raymond; Morris, Scott; Murphy, Martin; New, Edward; Rudisail, Steven; Santiago, Patricia; Scott, Tracy; Smith, Desiree; Witt, Kevin
Subject: RE: 2011 COOP Plan revision
Date: Tuesday, March 22, 2011 6:19:53 AM

Frank:

Just a reminder that in late April/early May we would like you to join us in meeting with Mike Johnson to provide him with a brief version of what he can expect on 6/23, so that we may fully

prepare him.....Bill Usilton and I will be in touch once we set up the meeting. Also, can you please add Bill Usilton to the distribution list on these COOP-related items? Many thanks.

From: Collins, Frank
Sent: Monday, March 21, 2011 1:56 PM
To: Alexander, Ryan; Billings, Sally; Burgess, Michele; Byrd, Calvin; Carter, Rozier; Christoffer-Baruch, Gail; Dickson, Billy; Fitzgerald, Rebecca; Golla, Joe; Harrington, Holly; Hinson, Felicia; Howell, Linda; Jasinski, Robert; Jefferson, Steven; Kowalczyk, Jeffrey; Kozal, Jason; Lazar, Carol; Lyons-Burke, Kathy; Marshall, Jane; McKinley, Raymond; Morris, Scott; Murphy, Martin; New, Edward; Rudisail, Steven; Santiago, Patricia; Scott, Tracy; Smith, Desiree; Witt, Kevin
Subject: 2011 COOP Plan revision

Please see the Shared Documents section of the Continuity Working Group portal for working drafts of 2011 COOP Plan revision. (See also ML110620540) These drafts were compiled using inputs provided over January and February by working group members. The drafts were in review by NSIR/DPR/Coordination Branch and Incident Response (Jane Marshall and Scott Morris, respectively) at the beginning of the ongoing Fukushima Daiichi related operations center activities.

There is also a folder on the Shared Documents titled 2011 COOP Plan revision. That folder contains MS Word comparison files for the 2010 to 2011 revision.

I will arrange a teleconference to discuss this revision as soon as the operation center activity subsides.

RRRR-329

From: Kenagy, W David
To: Kenagy, W David; McClelland, Vince; Rodriguez, Veronica; Heinrich, Ann; HOO Hoc; HOO2 Hoc; Huffman, William; DeCair, Sara@epamail.epa.gov; timothy.greten@dhs.gov; Maria.Marinissen@hhs.gov; OPSSOO@is.pentagon.mil; doehgeoc@oem.doe.gov; hhs.soc@hhs.gov; James.Kish@dhs.gov; HOO Hoc; Smith, Brooke; Zubarev, Jill E; Shaffer, Mark R; NITOPS@nnsa.doe.gov; Skvpek, Thomas M; John J. Szymanski@ostp.eop.gov
Subject: RE: IAEA distributed documents
Date: Saturday, March 19, 2011 4:28:40 PM
Attachments: Letter - Summary of reactor unit status at 1450 19-March UTC v1[1].pdf
Corrected press release[1].pdf
Table - Summary of reactor unit status at 19-March-12-00UTC[1].pdf

RRR/330

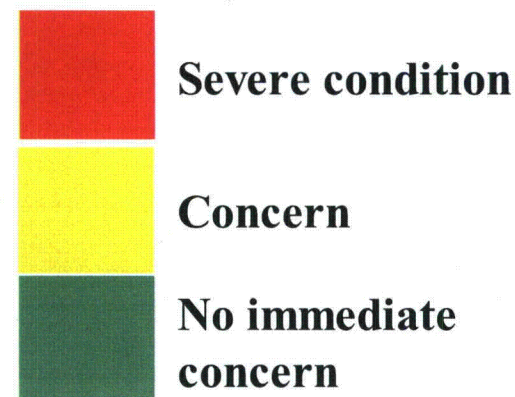
Unit	1	2	3	4
Power (MWe/th)	460/1380	784/2381	784/2381	784/2381
Type of Reactor	BWR-3	BWR-4	BWR-4	BWR-4
Status at time of EQ	In service – auto shutdown	In service – auto shutdown	In service – auto shutdown	Outage
Core and fuel	Damaged	Damaged	Damaged	No fuel rods
RPV & RCS integrity	Unknown	Unknown	Unknown	N/A
Containment integrity	No damage reported	Damage suspected	No information	N/A
AC Power	<u>Substation connected</u>	<u>Substation connected</u>	Not available	Not available
Building	Severe damage	Slight damage	Severe damage	Severe damage
Water level of RPV	Around half of Fuel assembly	Around half of Fuel assembly	Around half of Fuel assembly	N/A
Pressure of RPV	Stabilized	Stabilized	Stabilized	
CV Pressure Drywell	<u>Recovered indication</u>	Stable	Stable	
Water injection to RPV	Seawater	Seawater	Seawater	N/A
Water injection to CV	No information	No information	No information	N/A
Spent Fuel Pool Status	No information	No information	No information	No information

3/19/2011 4:13 PM

Unit	5	6
Power	784/2381	1100/3293
Type of Reactor	BWR-4	BWR-5
Status at the EQ occurred	Outage	Outage
Core and Fuel	No damage expected	No Damage expected
Containment int.	No damage expected	No damage expected
AC Power	<u>2nd Emergency Diesel from unit 6</u>	Emergency Diesel
Building	No damage reported	No damage reported
Water level of RPV	<u>Above fuel/decreasing</u>	<u>Above fuel/decreasing</u>
Pressure of RPV	<u>Slightly increasing</u>	<u>Slightly increasing</u>
Containment Pressure	<u>No information</u>	<u>No information</u>
Water injection to RPV	Injection in Progress	Injection in Progress
Water injection to CV	Not needed now	Not needed now
Spent Fuel Pool Temperature	<u>Slowly increasing</u>	<u>Slowly increasing</u>

Reporting time:

Date : March 19



From: Harrington, Holly
To: Dricks, Victor
Subject: RE: You have to watch this!
Date: Tuesday, March 22, 2011 8:59:00 AM

You Tube was opened up while you were gone

From: Dricks, Victor
Sent: Tuesday, March 22, 2011 8:59 AM
To: Harrington, Holly
Subject: RE: You have to watch this!

We can't

From: Harrington, Holly
Sent: Tuesday, March 22, 2011 7:58 AM
To: Brenner, Eliot; Burnell, Scott; Couret, Ivonne; Hayden, Elizabeth; McIntyre, David; Chandrathil, Prema; Dricks, Victor; Hannah, Roger; Ledford, Joey; Mitlyng, Viktoria; Screnci, Diane; Sheehan, Neil; Uselding, Lara
Cc: Taylor, Robert
Subject: You have to watch this!

<http://www.youtube.com/watch?v=5sakN2hSVxA>

RRRR-331

From: Brenner, Eliot
To: Brumfiel, Geoff; Burnell, Scott
Cc: Hayden, Elizabeth
Subject: RE: State of unit 2?
Date: Thursday, April 07, 2011 5:27:28 PM

Geoff: there was no statement per se. Congressman Markey put two redacted emails up on his website yesterday. You will note that our observation was speculative, not a definitive statement.

From: Brumfiel, Geoff [mailto:g.brumfiel@nature.com]
Sent: Thursday, April 07, 2011 10:50 AM
To: Burnell, Scott
Cc: Brenner, Eliot; Hayden, Elizabeth
Subject: State of unit 2?
Importance: High

Morning all,

Can you provide me with your statement on the state of Unit 2? Also is there a location for these statements on the website? The newest release I can find is from 3/23/11.

Best,
Geoff

Geoff Brumfiel
News Reporter | Nature
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<http://www.nature.com/news/>

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Registered Office Brunel Road, Houndmills, Basingstoke RG21 6XS

RRRC /332

From: OST02 HOC

To: Abrams, Charlotte; Abu-Eid, Bobby; Adams, John; Afshar-Tous, Mugeh; Ahn, Hosung; Alemu, Bezakulu; Alqama, Don; Alter, Peter; Anderson, Brian; Anderson, James; Arndt, Steven; Arribas-Colon, Maria; Ashkeboussi, Nima; Athey, George; Baker, Stephen; Ballam, Nick; Barnhurst, Daniel; Barr, Cynthia; Barss, Dan; Bazian, Samuel; Benner, Eric; Bensi, Michelle; Bergman, Thomas; Berry, Rolie; Bhachu, Ujaagar; Bloom, Steven; Blount, Tom; Boger, Bruce; Bonnette, Cassandra; Borchardt, Bill; Bowers, Anthony; Bowman, Gregory; Boyce, Tom (RES); Brandon, Lou; Brandt, Philip; Brenner, Eliot; Brock, Kathryn; Brown, Cris; Brown, David; Brown, Eva; Brown, Frederick; Brown, Michael; Bukharin, Oleg; Burnell, Scott; Bush-Goddard, Stephanie; Campbell, Stephen; Camper, Larry; Carlson, Donald; Carpenter, Cynthia; Carter, Mary; Case, Michael; Casto, Greg; Cecere, Bethany; Cervera, Margaret; Chazell, Russell; Chen, Yen-Ju; Cheng, May; Cheok, Michael; Chokshi, Nilesh; Chowdhury, Prosanta; Chung, Donald; Circle, Jeff; Clement, Richard; Clinton, Rebecca; Coe, Doug; Coggins, Angela; Collins, Frank; Cool, Donald; Correia, Richard; Corson, James; Costa, Arlon; Couret, Ivonne; Craffey, Ryan; Crutchley, Mary Glenn; Cruz, Zahira; Cuadrado, Leira; Dacus, Eugene; DeCicco, Joseph; Devlin, David; Dembek, Stephen; Devlin, Stephanie; Dimmick, Lisa; Doane, Margaret; Dorman, Dan; Dorsey, Cynthia; Dozier, Jerry; Drake, Margaret; Droggitis, Spiros; Dube, Donald; Dudes, Laura; Eads, Johnny; Easson, Stuart; Emche, Danielle; English, Lance; Erlanger, Craig; Esmaili, Hossein; Evans, Michele; Faria-Ocasio, Carolyn; Figueroa, Roberto; Fiske, Jonathan; Flanders, Scott; Flannery, Cindy; Floyd, Daphene; Foggie, Kirk; Foster, Jack; Fragovannis, Nancy; Franovich, Rani; Frazier, Alan; Freshman, Steve; Fuller, Edward; Galletta, Thomas; Gambone, Kimberly; Gardocki, Stanley; Gartman, Michael; Gibson, Kathy; Glitter, Joseph; Gilmer, James; Glenn, Nichole; Gordon, Dennis; Gott, William; Grant, Jeffery; Gray, Anita; Gray, Kathy; Greenwood, Carol; Grimes, Kelly; Grobe, Jack; Gross, Allen; Gulla, Gerald; Hackett, Edwin; Hale, Jerry; Hardesty, Duane; Hardin, Kimberly; Hardin, Leroy; Harrington, Holly; Harris, Tim; Harrison, Donnie; Hart, Ken; Hart, Michelle; Harvey, Brad; Hasselberg, Rick; Hayden, Elizabeth; Helton, Donald; Henderson, Karen; Hiland, Patrick; Hipschman, Thomas; Holahan, Patricia; Holahan, Vincent; Holian, Brian; HOO Hoc; Horn, Brian; Howard, Arlette; Howard, Tabitha; Howe, Allen; Huffert, Anthony; Hurd, Sapna; Huyck, Doug; Imboden, Andy; Isom, James; Jackson, Karen; Jacobson, Jeffrey; Jervey, Richard; Jessie, Janelle; Johnson, Don; Johnson, Michael; Jolicoeur, John; Jones, Andrea; Jones, Cynthia; Jones, Henry; Kahler, Carolyn; Kammerer, Annie; Karas, Rebecca; Kauffman, John; Khan, Omar; Kolb, Timothy; Kotzalas, Margie; Kowalczyk, Jeffrey; Kratchman, Jessica; Kugler, Andrew; Lamb, Christopher; Lane, John; Larson, Emily; Laur, Steven; LaVie, Steve; Lewis, Robert; Li, Yong; Lichtz, Taylor; Lising, Jason; Lombard, Mark; Lovell, Louise; Lubinski, John; Lui, Christiana; Lukes, Kim; Lynch, Jeffery; Ma, John; Mamish, Nader; Manahan, Michelle; Marksberry, Don; Marshall, Jane; Masao, Nagai; Maupin, Cardelia; Mayros, Lauren; Mazaika, Michael; McConnell, Keith; McCoppin, Michael; McDermott, Brian; McGinty, Tim; McGovern, Denise; McIntyre, David; McMurtry, Anthony; Merritt, Christina; Meyer, Karen; Miller, Charles; Miller, Chris; Milligan, Patricia; Miranda, Samuel; Mohseni, Aby; Moore, Scott; Morlang, Gary; Morris, Scott; Mroz (Sahm), Sara; Munson, Clifford; Murray, Charles; Musico, Bruce; Nerret, Amanda; Nguyen, Caroline; Norris, Michael; Norton, Charles; Nosek, Andrew; Opara, Stella; Ordaz, Vonna; Orr, Mark; Owens, Janice; Padovan, Mark; Parillo, John; Patel, Jay; Patel, Pravin; Patrick, Mark; Perin, Vanice; Pope, Tia; Powell, Amy; Purdy, Gary; Quinlan, Kevin; Raddatz, Michael; Ragland, Robert; Ralph, Melissa; Ramsey, Jack; Reed, Elizabeth; Reed, Sara; Reed, Wendy; Reeves, Rosemary; Reis, Terrence; Resner, Mark; Riley (OCA), Timothy; Riner, Kelly; Rini, Brett; Roach, Edward; Robinson, Edward; Rodriguez-Luccioni, Hector; Roggenbrodt, William; Ropon, Kimberly; Rosales-Cooper, Cindy; Rosenberg, Stacey; Ross-Lee, MaryJane; Roundtree, Amy; Ruland, William; Russell, Tonya; Ryan, Michelle; Salay, Michael; Salter, Susan; Salus, Amy; Sanfilippo, Nathan; Santos, Daniel; Scarbrough, Thomas; Schaperow, Jason; Schmidt, Duane; Schmidt, Rebecca; Schoenebeck, Greg; Schrader, Eric; Schwartzman, Jennifer; Seber, Dogan; See, Kenneth; Shane, Raeann; Shea, James; Shepherd, Jill; Sheron, Brian; Skarda, Raymond; Skeen, David; Sloan, Scott; Smiroldo, Elizabeth; Smith, Brooke; Smith, Stacy; Smith, Theodore; Solorio, Dave; Stahl, Eric; Stang, Annette; Stark, Johnathan; Steger (Tucci), Christine; Stieve, Alice; Stone, Rebecca; Stransky, Robert; Sturz, Fritz; Sullivan, Randy; Summers, Robert; Sun, Casper; Susco, Jeremy; Takacs, Michael; Tappert, John; Tegeler, Bret; Temple, Jeffrey; Thaggard, Mark; Thomas, Eric; Thorp, John; Tiruneh, Nebiyu; Tobin, Jennifer; Trefethen, Jean; Tschiltz, Michael; Turtill, Richard; Uhle, Jennifer; Valencia, Sandra; Vaughn, James; Velazquez-Lozada, Alexander; Vick, Lawrence; Virgilio, Martin; Virgilio, Rosetta; Ward, Leonard; Ward, William; Wastler, Sandra; Watson, Bruce; Webber, Robert; Weber, Michael; White, Bernard; Wiggins, Jim; Williams, Donna; Williams, Joseph; Williams, Tamera; Williamson, Linda; Willis, Dori; Wimbush, Andrea; Wittick, Brian; Wray, John; Wright, Lisa (Gibney); Wright, Ned; Wunder, George; Young, Francis; Zimmerman, Jacob; Zimmerman, Roy

Subject: Staffing Watchbill for Japanese Earthquake/Tsunami Response

Date: Thursday, April 07, 2011 3:43:55 PM

Attachments: Apr 3 - 9 2011 Watchbill HOC.pdf
Apr 10 - 16 2011 Watchbill HOC.pdf

Attached is the response schedule through April 16th. This upcoming weekend is attached in the first file. April 10-16 is attached in the 2nd file.

Please note this roster may be adjusted as staffing requirements change throughout the upcoming weeks.

If you would like to pick up additional shifts or need to change the schedule, please contact your team coordinator and the following cognizant individuals:

RRRR-333

Liaison Team: Jeff Temple

Reactor Safety Team: Rick Hasselberg / Peter Alter

Protective Measures Team: Lou Brandon

Thank you,

OST02

Japan Earthquake ERO Staffing Roster

April 3-9, 2011

Pay Period 8 - Week 2

Position	Date	Time	Staff
Executive Team			
ET Director			
Sat-Sun	4/2-4/3	11pm - 7am	Cynthia Carpenter
Sun	3-Apr	7am - 3pm	Michele Evans
Sun	3-Apr	3pm-11pm	Brian Sheron
Sun-Mon	4/3-4/4	11pm - 7am	Mike Johnson
Mon	4-Apr	7am - 3pm	Jim Wiggins
Mon	4-Apr	3pm-11pm	Cynthia Carpenter
Mon-Tue	4/4-4/5	11pm - 7am	Mike Johnson
Tue	5-Apr	7am - 3pm	Bruce Boger
Tue	5-Apr	3pm-11pm	Cynthia Carpenter
Tue-Wed	4/5-4/6	11pm - 7am	Mike Johnson
Wed	6-Apr	7am - 3pm	Jim Wiggins
Wed	6-Apr	3pm-11pm	Roy Zimmerman
Wed-Thur	4/6-4/7	11pm - 7am	Mike Johnson
Thur	7-Apr	7am - 3pm	Bruce Boger
Thur	7-Apr	3pm-11pm	Roy Zimmerman
Thur-Fri	4/7-4/8	11pm - 7am	Jennifer Uhle
Fri	8-Apr	7am - 3pm	Jim Wiggins
Fri	8-Apr	3pm-11pm	Roy Zimmerman
Fri-Sat	4/8-4/9	11pm-7am	Jennifer Uhle
Sat	9-Apr	7am - 3pm	Michele Evans
Sat	9-Apr	3pm-11pm	Roy Zimmerman
Sat-Sun	4/9-4/10	11pm - 7am	Jennifer Uhle
ET Response Advisor			
Sat-Sun	4/2-4/3	11pm - 7am	Brian McDermott
Sun	3-Apr	7am - 3pm	Tim McGinty
Sun	3-Apr	3pm-11pm	Chris Miller
Sun-Mon	4/3-4/4	11pm - 7am	Brian McDermott
Mon	4-Apr	7am - 3pm	Mark Thaggard
Mon	4-Apr	3pm-11pm	Joe Giitter
Mon-Tue	4/4-4/5	11pm - 7am	Brian McDermott
Tue	5-Apr	7am - 3pm	Tim McGinty
Tue	5-Apr	3pm-11pm	Joe Giitter
Tue-Wed	4/5-4/6	11pm - 7am	Scott Morris
Wed	6-Apr	7am - 3pm	Tim McGinty
Wed	6-Apr	3pm-11pm	Joe Giitter
Wed-Thur	4/6-4/7	11pm - 7am	Scott Morris
Thur	7-Apr	7am - 3pm	Joe Holonich
Thur	7-Apr	3pm-11pm	Joe Giitter
Thur-Fri	4/7-4/8	11pm - 7am	Scott Morris
Fri	8-Apr	7am - 3pm	Joe Holonich
Fri	8-Apr	3pm-11pm	Tom Blount
Fri-Sat	4/8-4/9	11pm-7am	Mark Thaggard
Sat	9-Apr	7am - 3pm	Chris Miller
Sat	9-Apr	3pm-11pm	Tom Blount
Sat-Sun	4/9-4/10	11pm - 7am	Mark Thaggard
ET Rx Prot Measures & State Coordinator			

Japan Earthquake ERO Staffing Roster

April 3-9, 2011

Pay Period 8 - Week 2

Sat-Sun	4/2-4/3	11pm - 7am	N/A
Sun	3-Apr	7am - 3pm	N/A
Sun	3-Apr	3pm-11pm	N/A
Sun-Mon	4/3-4/4	11pm - 7am	N/A
Mon	4-Apr	7am - 3pm	N/A
Mon	4-Apr	3pm-11pm	N/A
Mon-Tue	4/4-4/5	11pm - 7am	N/A
Tue	5-Apr	7am - 3pm	N/A
Tue	5-Apr	3pm-11pm	N/A
Tue-Wed	4/5-4/6	11pm - 7am	N/A
Wed	6-Apr	7am - 3pm	N/A
Wed	6-Apr	3pm-11pm	N/A
Wed-Thur	4/6-4/7	11pm - 7am	N/A
Thur	7-Apr	7am - 3pm	N/A
Thur	7-Apr	3pm-11pm	N/A
Thur-Fri	4/7-4/8	11pm - 7am	N/A
Fri	8-Apr	7am - 3pm	N/A
Fri	8-Apr	3pm-11pm	N/A
Fri-Sat	4/8-4/9	11pm-7am	N/A
Sat	9-Apr	7am - 3pm	N/A
Sat	9-Apr	3pm-11pm	N/A
Sat-Sun	4/9-4/10	11pm - 7am	N/A
Executive Briefing Team			
EBT Admin. Assistant		Email: OST04	
Sat-Sun	4/2-4/3	11pm - 7am	N/A
Sun	3-Apr	7am - 3pm	N/A
Sun	3-Apr	3pm-11pm	Jon Fiske
Sun-Mon	4/3-4/4	11pm - 7am	N/A
Mon	4-Apr	7am - 3pm	Jon Fiske
Mon	4-Apr	3pm-11pm	Carolyn Kahler
Mon-Tue	4/4-4/5	11pm - 7am	N/A
Tue	5-Apr	7am - 3pm	N/A
Tue	5-Apr	3pm-11pm	Annette Stang
Tue-Wed	4/5-4/6	11pm - 7am	N/A
Wed	6-Apr	7am - 3pm	N/A
Wed	6-Apr	3pm-11pm	Annette Stang
Wed-Thur	4/6-4/7	11pm - 7am	N/A
Thur	7-Apr	7am - 3pm	N/A
Thur	7-Apr	3pm-11pm	Annette Stang
Thur-Fri	4/7-4/8	11pm - 7am	N/A
Fri	8-Apr	7am - 3pm	N/A
Fri	8-Apr	3pm-11pm	Louise Lovell
Fri-Sat	4/8-4/9	11pm-7am	N/A
Sat	9-Apr	7am - 3pm	N/A
Sat	9-Apr	3pm-11pm	Annette Stang
Sat-Sun	4/9-4/10	11pm - 7am	N/A
EBT Coordinator		Email: LIA07	
Sat-Sun	4/2-4/3	11pm - 7am	Yen Chen
Sun	3-Apr	7am - 3pm	N/A
Sun	3-Apr	3pm-11pm	Nichole Glenn

Japan Earthquake ERO Staffing Roster

April 3-9, 2011

Pay Period 8 - Week 2

Sun-Mon	4/3-4/4	11pm - 7am	Jim Anderson
Mon	4-Apr	7am - 3pm	Sara Mroz
Mon	4-Apr	3pm-11pm	Yen Chen
Mon-Tue	4/4-4/5	11pm - 7am	Jim Anderson
Tue	5-Apr	7am - 3pm	N/A (On Call Yen Chen 415-1018 or 301-840-9497)
Tue	5-Apr	3pm-11pm	Sara Mroz
Tue-Wed	4/5-4/6	11pm - 7am	Jim Anderson
Wed	6-Apr	7am - 3pm	N/A
Wed	6-Apr	3pm-11pm	Sara Mroz
Wed-Thur	4/6-4/7	11pm - 7am	Jim Anderson
Thur	7-Apr	7am - 3pm	N/A
Thur	7-Apr	3pm-11pm	Yen Chen
Thur-Fri	4/7-4/8	11pm - 7am	Jim Anderson
Fri	8-Apr	7am - 3pm	N/A
Fri	8-Apr	3pm-11pm	Sara Mroz
Fri-Sat	4/8-4/9	11pm-7am	Jim Anderson
Sat	9-Apr	7am - 3pm	N/A
Sat	9-Apr	3pm-11pm	Yen Chen
Sat-Sun	4/9-4/10	11pm - 7am	Jim Anderson

Executive Support Team

EST Status Officer

Email: ET07

Sat-Sun	4/2-4/3	11pm - 7am	Jeff Grant
Sun	3-Apr	7am - 3pm	John Jolicoeur
Sun	3-Apr	3pm-11pm	Bill Gott
Sun-Mon	4/3-4/4	11pm - 7am	Sally Billings
Mon	4-Apr	7am - 3pm	Jane Marshall
Mon	4-Apr	3pm-11pm	Bill Gott
Mon-Tue	4/4-4/5	11pm - 7am	Sally Billings
Tue	5-Apr	7am - 3pm	Doug Huyck
Tue	5-Apr	3pm-11pm	Bill Gott
Tue-Wed	4/5-4/6	11pm - 7am	Jeff Grant
Wed	6-Apr	7am - 3pm	Jane Marshall
Wed	6-Apr	3pm-11pm	John Jolicoeur
Wed-Thur	4/6-4/7	11pm - 7am	Jeff Grant
Thur	7-Apr	7am - 3pm	Jane Marshall
Thur	7-Apr	3pm-11pm	Bill Gott
Thur-Fri	4/7-4/8	11pm - 7am	Jeff Grant
Fri	8-Apr	7am - 3pm	Jane Marshall
Fri	8-Apr	3pm-11pm	Bill Gott
Fri-Sat	4/8-4/9	11pm-7am	Jeff Grant
Sat	9-Apr	7am - 3pm	Jane Marshall
Sat	9-Apr	3pm-11pm	Bill Gott
Sat-Sun	4/9-4/10	11pm - 7am	Jeff Grant

EST Actions Officer

Email: ET05

Sat-Sun	4/2-4/3	11pm - 7am	N/A
Sun	3-Apr	7am - 3pm	Kelly Grimes
Sun	3-Apr	3pm-11pm	Melissa Ralph
Sun-Mon	4/3-4/4	11pm - 7am	N/A
Mon	4-Apr	7am - 3pm	Bezakulu Alemu

Japan Earthquake ERO Staffing Roster

April 3-9, 2011

Pay Period 8 - Week 2

Mon	4-Apr	3pm-11pm	Amy Roundtree
Mon-Tue	4/4-4/5	11pm - 7am	N/A
Tue	5-Apr	7am - 3pm	Bezakulu Alemu
Tue	5-Apr	3pm-11pm	Amy Roundtree
Tue-Wed	4/5-4/6	11pm - 7am	N/A
Wed	6-Apr	7am - 3pm	Kelly Grimes
Wed	6-Apr	3pm-11pm	Amy Roundtree
Wed-Thur	4/6-4/7	11pm - 7am	N/A
Thur	7-Apr	7am - 3pm	Don Algama
Thur	7-Apr	3pm-11pm	Amy Roundtree
Thur-Fri	4/7-4/8	11pm - 7am	N/A
Fri	8-Apr	7am - 3pm	Kelly Grimes
Fri	8-Apr	3pm-11pm	Amy Roundtree
Fri-Sat	4/8-4/9	11pm-7am	N/A
Sat	9-Apr	7am - 3pm	Melissa Ralph
Sat	9-Apr	3pm-11pm	Bezakulu Alemu
Sat-Sun	4/9-4/10	11pm - 7am	N/A
EST Coordinator Email: OST01			
Sat-Sun	4/2-4/3	11pm - 7am	Tony Bowers
Sun	3-Apr	7am - 7pm	Jeff Kowalczyk
Sun-Mon	4/3-4/4	7pm - 7am	Rebecca Stone
Mon	4-Apr	7am - 3pm	Steve Campbell
Mon	4-Apr	3pm-11pm	Jeff Kowalczyk
Mon-Tue	4/4-4/5	11pm - 7am	Rebecca Stone
Tue	5-Apr	7am - 3pm	Tony Bowers
Tue	5-Apr	3pm-11pm	Jeff Kowalczyk
Tue-Wed	4/5-4/6	11pm - 7am	Rebecca Stone
Wed	6-Apr	7am - 3pm	Steve Campbell
Wed	6-Apr	3pm-11pm	Melissa Ralph
Wed-Thur	4/6-4/7	11pm - 7am	Rebecca Stone
Thur	7-Apr	7am - 3pm	Tony Bowers
Thur	7-Apr	3pm-11pm	Sally Billings
Thur-Fri	4/7-4/8	11pm - 7am	Stacy Smith
Fri	8-Apr	7am - 3pm	Tony Bowers
Fri	8-Apr	3pm-11pm	Sally Billings
Fri-Sat	4/8-4/9	11pm-7am	N/A
Sat	9-Apr	7am - 3pm	Jeff Kowalczyk
Sat	9-Apr	3pm-11pm	Cynthia Dorsey
Sat-Sun	4/9-4/10	11pm - 7am	Clyde Ragland
EST Chronology Officer Email: ET02			
Sat-Sun	4/2-4/3	11pm - 7am	Nick Ballam
Sun	3-Apr	7am - 3pm	TR Rowe
Sun	3-Apr	3pm-11pm	Carolyn Faria-Ocasio
Sun-Mon	4/3-4/4	11pm - 7am	Nick Ballam
Mon	4-Apr	7am - 3pm	TR Rowe
Mon	4-Apr	3pm-11pm	Rebecca Karas

Japan Earthquake ERO Staffing Roster

April 3-9, 2011

Pay Period 8 - Week 2

Mon-Tue	4/4-4/5	11pm - 7am	Tom Scarbrough
Tue	5-Apr	7am - 3pm	TR Rowe
Tue	5-Apr	3pm-11pm	Rebecca Karas/Cynthia Rheaume (Training)
Tue-Wed	4/5-4/6	11pm - 7am	Carolyn Faria-Ocasio
Wed	6-Apr	7am - 3pm	Stella Opara
Wed	6-Apr	3pm-11pm	Rebecca Karas
Wed-Thur	4/6-4/7	11pm - 7am	Carolyn Faria-Ocasio
Thur	7-Apr	7am - 3pm	Jessica Kratchman
Thur	7-Apr	3pm-11pm	Rebecca Karas
Thur-Fri	4/7-4/8	11pm - 7am	Tom Scarbrough
Fri	8-Apr	7am - 3pm	Stella Opara
Fri	8-Apr	3pm-11pm	Rebecca Karas
Fri-Sat	4/8-4/9	11pm-7am	Nick Ballam
Sat	9-Apr	7am - 3pm	Jon Fiske
Sat	9-Apr	3pm-11pm	Sandra Valencia
Sat-Sun	4/9-4/10	11pm - 7am	Nick Ballam
EST Response Ops Mgr			
Email: ET03			
Sat-Sun	4/2-4/3	11pm - 7am	Omar Khan
Sun	3-Apr	7am - 3pm	Roberto Figueroa
Sun	3-Apr	3pm-11pm	Sandra Valencia
Sun-Mon	4/3-4/4	11pm - 7am	Omar Khan
Mon	4-Apr	7am - 3pm	Bob Stransky
Mon	4-Apr	3pm-11pm	Karen Jackson
Mon-Tue	4/4-4/5	11pm - 7am	Nick Ballam
Tue	5-Apr	7am - 3pm	Bob Stransky
Tue	5-Apr	3pm-11pm	Omar Khan
Tue-Wed	4/5-4/6	11pm - 7am	Roberto Figueroa
Wed	6-Apr	7am - 3pm	Karen Jackson
Wed	6-Apr	3pm-11pm	Omar Khan
Wed-Thur	4/6-4/7	11pm - 7am	Cris Brown
Thur	7-Apr	7am - 3pm	Karen Jackson
Thur	7-Apr	3pm-11pm	May Cheng
Thur-Fri	4/7-4/8	11pm - 7am	Cris Brown
Fri	8-Apr	7am - 3pm	Karen Jackson
Fri	8-Apr	3pm-11pm	May Cheng
Fri-Sat	4/8-4/9	11pm-7am	Cris Brown
Sat	9-Apr	7am - 3pm	Jean Trefethen
Sat	9-Apr	3pm-11pm	Roberto Figueroa
Sat-Sun	4/9-4/10	11pm - 7am	Cris Brown
EST Admin. Assistant			
Email: OST02			
Sat-Sun	4/2-4/3	11pm - 7am	N/A
Sun	3-Apr	7am - 3pm	Michelle Manahan
Sun	3-Apr	3pm-11pm	Cynthia Dorsey
Sun-Mon	4/3-4/4	11pm - 7am	N/A
Mon	4-Apr	7am - 3pm	Michelle Manahan
Mon	4-Apr	3pm-11pm	Andrea Wimbush
Mon-Tue	4/4-4/5	11pm - 7am	N/A
Tue	5-Apr	7am - 3pm	Patty Nibert
Tue	5-Apr	3pm-11pm	Andrea Wimbush

Japan Earthquake ERO Staffing Roster

April 3-9, 2011

Pay Period 8 - Week 2

Tue-Wed	4/5-4/6	11pm - 7am	N/A
Wed	6-Apr	7am - 3pm	Michelle Manahan
Wed	6-Apr	3pm-11pm	Andrea Wimbush
Wed-Thur	4/6-4/7	11pm - 7am	N/A
Thur	7-Apr	7am - 3pm	Taylor Lichatz
Thur	7-Apr	3pm-11pm	N/A
Thur-Fri	4/7-4/8	11pm - 7am	N/A
Fri	8-Apr	7am - 3pm	N/A
Fri	8-Apr	3pm-11pm	N/A
Fri-Sat	4/8-4/9	11pm-7am	N/A
Sat	9-Apr	7am - 3pm	N/A
Sat	9-Apr	3pm-11pm	N/A
Sat-Sun	4/9-4/10	11pm - 7am	N/A

Liaison Team

LT Director		Email: LIA06	
Sat-Sun	4/2-4/3	11pm - 7am	N/A
Sun	3-Apr	7am - 3pm	John Adams
Sun	3-Apr	3pm-11pm	Mark Lombard
Sun-Mon	4/3-4/4	11pm - 7am	N/A
Mon	4-Apr	7am - 3pm	John Adams
Mon	4-Apr	3pm-11pm	Mark Lombard
Mon-Tue	4/4-4/5	11pm - 7am	N/A
Tue	5-Apr	7am - 3pm	John Adams
Tue	5-Apr	3pm-11pm	Mark Lombard
Tue-Wed	4/5-4/6	11pm - 7am	N/A
Wed	6-Apr	7am - 3pm	Tom Bergman
Wed	6-Apr	3pm-11pm	Mark Lombard
Wed-Thur	4/6-4/7	11pm - 7am	N/A
Thur	7-Apr	7am - 3pm	Tom Bergman
Thur	7-Apr	3pm-11pm	Mark Lombard
Thur-Fri	4/7-4/8	11pm - 7am	N/A
Fri	8-Apr	7am - 3pm	Tom Bergman
Fri	8-Apr	3pm-11pm	Rich Correia
Fri-Sat	4/8-4/9	11pm-7am	N/A
Sat	9-Apr	7am - 3pm	Tom Bergman
Sat	9-Apr	3pm-11pm	Rich Correia
Sat-Sun	4/9-4/10	11pm - 7am	N/A

LT Coordinator		Email: LIA08	
Sat-Sun	4/2-4/3	11pm - 7am	Joe Rivers
Sun	3-Apr	7am - 3pm	Jeff Temple
Sun	3-Apr	3pm-11pm	Milt Murray
Sun-Mon	4/3-4/4	11pm - 7am	Joe Rivers
Mon	4-Apr	7am - 3pm	Rani Franovich
Mon	4-Apr	3pm-11pm	Milt Murray
Mon-Tue	4/4-4/5	11pm - 7am	Jeff Temple
Tue	5-Apr	7am - 3pm	Rani Franovich
Tue	5-Apr	3pm-11pm	Milt Murray
Tue-Wed	4/5-4/6	11pm - 7am	Jeff Temple
Wed	6-Apr	7am - 3pm	Rani Franovich

Japan Earthquake ERO Staffing Roster

April 3-9, 2011

Pay Period 8 - Week 2

Wed	6-Apr	3pm-11pm	Milt Murray
Wed-Thur	4/6-4/7	11pm - 7am	Janelle Jessie
Thur	7-Apr	7am - 3pm	Jeff Temple
Thur	7-Apr	3pm-11pm	Clyde Ragland
Thur-Fri	4/7-4/8	11pm - 7am	Janelle Jessie
Fri	8-Apr	7am - 3pm	Jeff Temple
Fri	8-Apr	3pm-11pm	Clyde Ragland
Fri-Sat	4/8-4/9	11pm-7am	Rani Franovich
Sat	9-Apr	7am - 3pm	Jeff Temple
Sat	9-Apr	3pm-11pm	Milt Murray
Sat-Sun	4/9-4/10	11pm - 7am	Rani Franovich

LT State Liaison**Email: LIA04/OST05**

Sat-Sun	2-Apr	9pm-7am	Amanda Noonan (ON CALL)
Sun	3-Apr	7am-2pm	Michelle Ryan (ON CALL)
Sun	3-Apr	2pm-9pm	Michelle Ryan (ON CALL)
Sun-Mon	4/3-4/4	9pm-7am	Michelle Ryan (ON CALL)
Mon	4-Apr	7am-2pm	Cindy Flannery
Mon	4-Apr	2pm-9pm	Stuart Easson
Mon-Tue	4/4-4/5	9pm-7am	Alison Rivera
Tue	5-Apr	7am-2pm	Kim Lukes
Tue	5-Apr	2pm-9pm	Michelle Ryan
Tue-Wed	4/5-4/6	9pm-7am	Amanda Noonan
Wed	6-Apr	7am-2pm	Cindy Flannery
Wed	6-Apr	2pm-9pm	Stuart Easson
Wed-Thur	4/6-4/7	9pm-7am	Alison Rivera
Thur	7-Apr	7am-2pm	Amanda Noonan
Thur	7-Apr	2pm-9pm	Alison Rivera
Thur-Fri	4/7-4/8	9pm-7am	Richard Turtill
Fri	8-Apr	7am-2pm	Alison Rivera
Fri	8-Apr	2pm-9pm	Richard Turtill
Fri-Sat	4/8-4/9	9pm-7am	Amanda Noonan
Sat	9-Apr	7am-2pm	Amanda Noonan (ON CALL)
Sat	9-Apr	2pm-9pm	Amanda Noonan (ON CALL)
Sat-Sun	4/9-4/10	9pm-7am	Amanda Noonan (ON CALL)

LT Federal Liaison**Email: LIA01/LIA11**

Sat-Sun	4/2-4/3	11pm - 7am	Jason Lising
Sun	3-Apr	7am - 3pm	Jerry Hale
Sun	3-Apr	3pm-11pm	Susan Salter
Sun-Mon	4/3-4/4	11pm - 7am	Jason Lising
Mon	4-Apr	7am - 3pm	Jerry Hale
Mon	4-Apr	3pm-11pm	Russ Chazell
Mon-Tue	4/4-4/5	11pm - 7am	Jason Lising
Tue	5-Apr	7am - 3pm	Beth Reed
Tue	5-Apr	3pm-11pm	Russ Chazell
Tue-Wed	4/5-4/6	11pm - 7am	Scott Sloan
Wed	6-Apr	7am - 3pm	Ned Wright
Wed	6-Apr	3pm-11pm	Jerry Hale
Wed-Thur	4/6-4/7	11pm - 7am	Scott Sloan
Thur	7-Apr	7am - 3pm	Ned Wright

Japan Earthquake ERO Staffing Roster

April 3-9, 2011

Pay Period 8 - Week 2

Thur	7-Apr	3pm-11pm	Russ Chazell
Thur-Fri	4/7-4/8	11pm - 7am	Scott Sloan
Fri	8-Apr	7am - 3pm	Ned Wright
Fri	8-Apr	3pm-11pm	Jerry Hale
Fri-Sat	4/8-4/9	11pm-7am	Scott Sloan
Sat	9-Apr	7am - 3pm	Russ Chazell
Sat	9-Apr	3pm-11pm	Jeff Lynch
Sat-Sun	4/9-4/10	11pm - 7am	Scott Sloan
LT Congressional Liaison (2) Email: LIA12			
Sat	2-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)
Sat	2-Apr	2pm-9pm	Amy Powell (ON CALL ONLY)
Sun	3-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)
Sun	3-Apr	2pm-9pm	Amy Powell (ON CALL ONLY)
Mon	4-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)
Mon	4-Apr	2pm-9pm	Amy Powell (ON CALL ONLY)
Tue	5-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)
Tue	5-Apr	2pm-9pm	Amy Powell (ON CALL ONLY)
Wed	6-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)
Wed	6-Apr	2pm-9pm	Amy Powell (ON CALL ONLY)
Thur	7-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)
Thur	7-Apr	2pm-9pm	Amy Powell (ON CALL ONLY)
Fri	8-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)
Fri	8-Apr	2pm-9pm	Amy Powell (ON CALL ONLY)
Sat	9-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)
Sat	9-Apr	2pm-9pm	Amy Powell (ON CALL ONLY)
Sun	10-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)
LT International Liaison (2) Email: LIA02/LIA03/LIA10			
Sat-Sun	4/2-4/3	11pm - 7am	Gerri Fehst / Elizabeth Smirolto
Sun	3-Apr	7am - 3pm	Steve Bloom / Karen Henderson
Sun	3-Apr	3pm-11pm	Janice Owens / Jenny Tobin
Sun-Mon	4/3-4/4	11pm - 7am	Jill Shepard / Elizabeth Smirolto
Mon	4-Apr	7am - 3pm	Steve Bloom/Lance English
Mon	4-Apr	3pm-11pm	Janice Owens / Jenny Tobin
Mon-Tue	4/4-4/5	11pm - 7am	Jill Shepard / Elizabeth Smirolto
Tue	5-Apr	7am - 3pm	Skip Young / Kirk Foggie
Tue	5-Apr	3pm-11pm	Steve Baker / Brian Wittick
Tue-Wed	4/5-4/6	11pm - 7am	Jill Shepard / Gerri Fehst
Wed	6-Apr	7am - 3pm	Skip Young / Kirk Foggie
Wed	6-Apr	3pm-11pm	Steve Baker / Brian Wittick
Wed-Thur	4/6-4/7	11pm - 7am	Jenny Tobin / Gerri Fehst
Thur	7-Apr	7am - 3pm	Skip Young / Kirk Foggie
Thur	7-Apr	3pm-11pm	Steve Baker / Brian Wittick
Thur-Fri	4/7-4/8	11pm - 7am	Jenny Tobin / Gerri Fehst
Fri	8-Apr	7am - 3pm	Eric Stahl / Mugeh Afshar-Tous
Fri	8-Apr	3pm-11pm	Jen Schwartzman / Charlotte Abrams
Fri-Sat	4/8-4/9	11pm-7am	Elizabeth Smirolto / Lauren Mayros
Sat	9-Apr	7am - 3pm	Eric Stahl / Mugeh Afshar-Tous
Sat	9-Apr	3pm-11pm	Jen Schwartzman / Charlotte Abrams
Sat-Sun	4/9-4/10	11pm - 7am	Jenny Tobin / Lauren Mayros

Japan Earthquake ERO Staffing Roster

April 3-9, 2011

Pay Period 8 - Week 2

Protective Measures Team			
PMTR Director		Email: PMT12	
Sat-Sun	4/2-4/3	11pm - 7am	Christiana Lui
Sun	3-Apr	7am - 3pm	Cyndi Jones
Sun	3-Apr	3pm-11pm	Scott Flanders
Sun-Mon	4/3-4/4	11pm - 7am	John Lubinski
Mon	4-Apr	7am - 3pm	Cyndi Jones
Mon	4-Apr	3pm-11pm	Scott Flanders
Mon-Tue	4/4-4/5	11pm - 7am	John Lubinski
Tue	5-Apr	7am - 3pm	Cyndi Jones
Tue	5-Apr	3pm-11pm	Scott Flanders
Tue-Wed	4/5-4/6	11pm - 7am	John Lubinski
Wed	6-Apr	7am - 3pm	Cyndi Jones (Patricia Milligan Noon-3pm)
Wed	6-Apr	3pm-11pm	Scott Flanders
Wed-Thur	4/6-4/7	11pm - 7am	John Lubinski
Thur	7-Apr	7am - 3pm	Trish Holahan
Thur	7-Apr	3pm-11pm	Patricia Milligan
Thur-Fri	4/7-4/8	11pm - 7am	Kathy Gibson
Fri	8-Apr	7am - 3pm	Trish Holahan
Fri	8-Apr	3pm-11pm	Don Cool
Fri-Sat	4/8-4/9	11pm-7am	Kathy Gibson
Sat	9-Apr	7am - 3pm	Trish Holahan
Sat	9-Apr	3pm-11pm	Don Cool
Sat-Sun	4/9-4/10	11pm - 7am	Kathy Gibson
PMTR Coordinator		Email: PMT09	
Sat-Sun	4/2-4/3	11pm - 7am	Lou Brandon
Sun	3-Apr	7am - 3pm	Brian Harris
Sun	3-Apr	3pm-11pm	Nima Ashkeboussi
Sun-Mon	4/3-4/4	11pm - 7am	Lou Brandon
Mon	4-Apr	7am - 3pm	Arlon Costa
Mon	4-Apr	3pm-11pm	Nima Ashkeboussi
Mon-Tue	4/4-4/5	11pm - 7am	Lou Brandon
Tue	5-Apr	7am - 3pm	Duane Hardesty
Tue	5-Apr	3pm-11pm	Nima Ashkeboussi
Tue-Wed	4/5-4/6	11pm - 7am	Lou Brandon
Wed	6-Apr	7am - 3pm	Arlon Costa
Wed	6-Apr	3pm-11pm	Ryan Craffey
Wed-Thur	4/6-4/7	11pm - 7am	Kimyata MorganButler
Thur	7-Apr	7am - 3pm	Duane Hardesty
Thur	7-Apr	3pm-11pm	Nima Ashkeboussi
Thur-Fri	4/7-4/8	11pm - 7am	Lou Brandon
Fri	8-Apr	7am - 3pm	Arlon Costa
Fri	8-Apr	3pm-11pm	Ryan Craffey
Fri-Sat	4/8-4/9	11pm-7am	Lou Brandon
Sat	9-Apr	7am - 3pm	Duane Hardesty
Sat	9-Apr	3pm-11pm	Ryan Craffey
Sat-Sun	4/9-4/10	11pm - 7am	Kimyata MorganButler
PMTR Prot Actions Asst Dir		Email: PMT12	

Japan Earthquake ERO Staffing Roster

April 3-9, 2011

Pay Period 8 - Week 2

Sat-Sun	4/2-4/3	11pm - 7am	Bruce Musico
Sun	3-Apr	7am - 3pm	Jessica Kratchman
Sun	3-Apr	3pm-11pm	Tim Harris
Sun-Mon	4/3-4/4	11pm - 7am	Greg Casto
Mon	4-Apr	7am - 3pm	Kathy Brock
Mon	4-Apr	3pm-11pm	Tim Harris
Mon-Tue	4/4-4/5	11pm - 7am	Greg Casto
Tue	5-Apr	7am - 3pm	Kathy Brock/Jessica Kratchman (1-3pm)
Tue	5-Apr	3pm-11pm	Tim Harris
Tue-Wed	4/5-4/6	11pm - 7am	Greg Casto
Wed	6-Apr	7am - 3pm	Kathy Brock
Wed	6-Apr	3pm-11pm	Sandra Wastler
Wed-Thur	4/6-4/7	11pm - 7am	Greg Casto
Thur	7-Apr	7am - 3pm	Kathy Brock
Thur	7-Apr	3pm-11pm	Tim Harris
Thur-Fri	4/7-4/8	11pm - 7am	Greg Casto
Fri	8-Apr	7am - 3pm	Kathy Brock (Bruce Musico from 11-1)
Fri	8-Apr	3pm-11pm	Sandra Wastler
Fri-Sat	4/8-4/9	11pm-7am	Jessica Kratchman
Sat	9-Apr	7am - 3pm	Stewart McGruder
Sat	9-Apr	3pm-11pm	Sandra Wastler
Sat-Sun	4/9-4/10	11pm - 7am	Jessica Kratchman

PMTR RAAD**Email: PMT05**

Sat-Sun	4/2-4/3	11pm - 7am	Mike Norris
Sun	3-Apr	7am - 3pm	Don Johnson
Sun	3-Apr	3pm-11pm	Duane Schmidt
Sun-Mon	4/3-4/4	11pm - 7am	Mike Norris
Mon	4-Apr	7am - 3pm	Cynthia Barr
Mon	4-Apr	3pm-11pm	Steve LaVie
Mon-Tue	4/4-4/5	11pm - 7am	Mike Norris
Tue	5-Apr	7am - 3pm	Duane Schmidt
Tue	5-Apr	3pm-11pm	Steve LaVie
Tue-Wed	4/5-4/6	11pm - 7am	Mike Norris
Wed	6-Apr	7am - 3pm	Stewart Schneider
Wed	6-Apr	3pm-11pm	Michelle Hart
Wed-Thur	4/6-4/7	11pm - 7am	Mike Norris
Thur	7-Apr	7am - 3pm	Duane Schmidt
Thur	7-Apr	3pm-11pm	Steve LaVie
Thur-Fri	4/7-4/8	11pm - 7am	Mike Norris
Fri	8-Apr	7am - 3pm	Cynthia Barr
Fri	8-Apr	3pm-11pm	Michelle Hart
Fri-Sat	4/8-4/9	11pm-7am	
Sat	9-Apr	7am - 3pm	
Sat	9-Apr	3pm-11pm	Michelle Hart
Sat-Sun	4/9-4/10	11pm - 7am	Mike Norris

PMTR Dose Assessment (RASCAL) - Need 2 people/day**Email: PMT02/PMT11**

Sat-Sun	4/2-4/3	11pm - 7am	John Parillo/Fritz Sturz
Sun	3-Apr	7am - 3pm	Ed Roach/Tony Huffert
Sun	3-Apr	3pm-11pm	Casper Sun/Kimberly (Rapon) Gambone

Japan Earthquake ERO Staffing Roster

April 3-9, 2011

Pay Period 8 - Week 2

Sun-Mon	4/3-4/4	11pm - 7am	John Parillo/AJ Nosek (called sick today)
Mon	4-Apr	7am - 3pm	Tony Huffert/Rich Clement/Anita Gray (in training)
Mon	4-Apr	3pm-11pm	Bernie White/Fritz Sturz
Mon-Tue	4/4-4/5	11pm - 7am	John Parillo/AJ Nosek (called sick today)
Tue	5-Apr	7am - 3pm	Tony Huffert/Rich Clement/John Tomon (in training)
Tue	5-Apr	3pm-11pm	Casper Sun/Fritz Sturz
Tue-Wed	4/5-4/6	11pm - 7am	AJ Nosek/Leroy Hardin
Wed	6-Apr	7am - 3pm	Tony Huffert/Rich Clement/Anita Gray (in training)
Wed	6-Apr	3pm-11pm	Casper Sun/Ron LaVera
Wed-Thur	4/6-4/7	11pm - 7am	Bernie White/AJ Nosek
Thur	7-Apr	7am - 3pm	Tony Huffert/Rich Clement
Thur	7-Apr	3pm-11pm	Casper Sun/Kimberly (Rapon) Gambone
Thur-Fri	4/7-4/8	11pm - 7am	Bernie White/Stephanie Bush-Goddard
Fri	8-Apr	7am - 3pm	/Rich Clement
Fri	8-Apr	3pm-11pm	Casper Sun/Mohammad Saba
Fri-Sat	4/8-4/9	11pm-7am	Ron LaVera/Stephanie Bush-Goddard
Sat	9-Apr	7am - 3pm	Fritz Sturz/Mohammad Saba
Sat	9-Apr	3pm-11pm	Casper Sun/
Sat-Sun	4/9-4/10	11pm - 7am	Stephanie Bush-Goddard/Ed Roach
PMTR GIS Analyst Email: GIS			
Sat-Sun	4/2-4/3	11pm - 7am	N/A
Sun	3-Apr	7am - 3pm	ON CALL ONLY
Sun	3-Apr	3pm-11pm	N/A
Sun-Mon	4/3-4/4	11pm - 7am	N/A
Mon	4-Apr	7am - 3pm	ON CALL ONLY
Mon	4-Apr	3pm-11pm	N/A
Mon-Tue	4/4-4/5	11pm - 7am	N/A
Tue	5-Apr	7am - 3pm	ON CALL ONLY
Tue	5-Apr	3pm-11pm	N/A
Tue-Wed	4/5-4/6	11pm - 7am	N/A
Wed	6-Apr	7am - 3pm	ON CALL ONLY
Wed	6-Apr	3pm-11pm	N/A
Wed-Thur	4/6-4/7	11pm - 7am	N/A
Thur	7-Apr	7am - 3pm	ON CALL ONLY
Thur	7-Apr	3pm-11pm	N/A
Thur-Fri	4/7-4/8	11pm - 7am	N/A
Fri	8-Apr	7am - 3pm	ON CALL ONLY
Fri	8-Apr	3pm-11pm	N/A
Fri-Sat	4/8-4/9	11pm-7am	N/A
Sat	9-Apr	7am - 3pm	ON CALL ONLY
Sat	9-Apr	3pm-11pm	N/A
Sat-Sun	4/9-4/10	11pm - 7am	N/A
PMTR Meteorologist Email: PMT01			
Sat-Sun	4/2-4/3	11pm - 7am	N/A
Sun	3-Apr	7am - 3pm	ON CALL ONLY
Sun	3-Apr	3pm-11pm	N/A
Sun-Mon	4/3-4/4	11pm - 7am	N/A
Mon	4-Apr	7am - 3pm	ON CALL ONLY
Mon	4-Apr	3pm-11pm	N/A

Japan Earthquake ERO Staffing Roster

April 3-9, 2011

Pay Period 8 - Week 2

Mon-Tue	4/4-4/5	11pm - 7am	N/A
Tue	5-Apr	7am - 3pm	ON CALL ONLY
Tue	5-Apr	3pm-11pm	N/A
Tue-Wed	4/5-4/6	11pm - 7am	N/A
Wed	6-Apr	7am - 3pm	ON CALL ONLY
Wed	6-Apr	3pm-11pm	N/A
Wed-Thur	4/6-4/7	11pm - 7am	N/A
Thur	7-Apr	7am - 3pm	ON CALL ONLY
Thur	7-Apr	3pm-11pm	N/A
Thur-Fri	4/7-4/8	11pm - 7am	N/A
Fri	8-Apr	7am - 3pm	ON CALL ONLY
Fri	8-Apr	3pm-11pm	N/A
Fri-Sat	4/8-4/9	11pm-7am	N/A
Sat	9-Apr	7am - 3pm	ON CALL ONLY
Sat	9-Apr	3pm-11pm	N/A
Sat-Sun	4/9-4/10	11pm - 7am	N/A

Reactor Safety Team**RST Director****Email: RST01**

Sat-Sun	4/2-4/3	11pm - 7am	Mike Case
Sun	3-Apr	7am - 3pm	Brian Holian
Sun	3-Apr	3pm-11pm	Bill Ruland
Sun-Mon	4/3-4/4	11pm - 7am	Laura Dudes
Mon	4-Apr	7am - 3pm	Brian Holian
Mon	4-Apr	3pm-11pm	Stu Richards
Mon-Tue	4/4-4/5	11pm - 7am	Laura Dudes
Tue	5-Apr	7am - 3pm	Brian Holian
Tue	5-Apr	3pm-11pm	Bill Ruland
Tue-Wed	4/5-4/6	11pm - 7am	Laura Dudes
Wed	6-Apr	7am - 3pm	Stu Richards
Wed	6-Apr	3pm-11pm	Ed Hackett
Wed-Thur	4/6-4/7	11pm - 7am	Laura Dudes
Thur	7-Apr	7am - 3pm	Mike Case
Thur	7-Apr	3pm-11pm	Brian Holian
Thur-Fri	4/7-4/8	11pm - 7am	Fred Brown
Fri	8-Apr	7am - 3pm	Mike Case
Fri	8-Apr	3pm-11pm	Pat Hiland
Fri-Sat	4/8-4/9	11pm-7am	Fred Brown
Sat	9-Apr	7am - 3pm	Mike Case
Sat	9-Apr	3pm-11pm	Pat Hiland
Sat-Sun	4/9-4/10	11pm - 7am	Fred Brown

RST Coordinator**Email: RST01B**

Sat-Sun	4/2-4/3	11pm - 7am	Oleg Bukharin
Sun	3-Apr	7am - 3pm	Rick Hasselberg
Sun	3-Apr	3pm-11pm	Eric Thomas
Sun-Mon	4/3-4/4	11pm - 7am	Frank Collins
Mon	4-Apr	7am - 3pm	Tom Boyce (RES)
Mon	4-Apr	3pm-11pm	Brett Rini
Mon-Tue	4/4-4/5	11pm - 7am	Mike Morlang
Tue	5-Apr	7am - 3pm	Frank Collins

Japan Earthquake ERO Staffing Roster

April 3-9, 2011

Pay Period 8 - Week 2

Tue	5-Apr	3pm-11pm	Greg Schoenebeck
Tue-Wed	4/5-4/6	11pm - 7am	Mike Morlang
Wed	6-Apr	7am - 3pm	Peter Alter
Wed	6-Apr	3pm-11pm	Greg Schoenebeck
Wed-Thur	4/6-4/7	11pm - 7am	Frank Collins
Thur	7-Apr	7am - 3pm	Tom Boyce (RES)
Thur	7-Apr	3pm-11pm	Greg Schoenebeck
Thur-Fri	4/7-4/8	11pm - 7am	Rick Hasselberg
Fri	8-Apr	7am - 3pm	Mark Orr
Fri	8-Apr	3pm-11pm	Joelle Starfros
Fri-Sat	4/8-4/9	11pm-7am	Frank Collins
Sat	9-Apr	7am - 3pm	Mark Orr
Sat	9-Apr	3pm-11pm	Kerri Kavanaugh
Sat-Sun	4/9-4/10	11pm - 7am	Oleg Bukharin

Severe Accident/PRA**Email: RST10**

Sat-Sun	4/2-4/3	11pm - 7am	Ray Skarda
Sun	3-Apr	7am - 3pm	Tom Koshy
Sun	3-Apr	3pm-11pm	Jerry Dozier
Sun-Mon	4/3-4/4	11pm - 7am	Antonio Zoulis
Mon	4-Apr	7am - 3pm	Mirela Gavrilas
Mon	4-Apr	3pm-11pm	Hossein Esmali
Mon-Tue	4/4-4/5	11pm - 7am	Antonio Zoulis
Tue	5-Apr	7am - 3pm	Jim Gilmer
Tue	5-Apr	3pm-11pm	Ed Fuller
Tue-Wed	4/5-4/6	11pm - 7am	See-Ming Wong
Wed	6-Apr	7am - 3pm	Ray Skarda
Wed	6-Apr	3pm-11pm	Tom Koshy
Wed-Thur	4/6-4/7	11pm - 7am	Ben Beasley
Thur	7-Apr	7am - 3pm	Mirela Gavrilas
Thur	7-Apr	3pm-11pm	Hossein Esmali
Thur-Fri	4/7-4/8	11pm - 7am	Ben Beasley
Fri	8-Apr	7am - 3pm	Mirela Gavrilas
Fri	8-Apr	3pm-11pm	Ray Skarda
Fri-Sat	4/8-4/9	11pm-7am	Shawn Marshall
Sat	9-Apr	7am - 3pm	See-Ming Wong/ Raj Lyengar
Sat	9-Apr	3pm-11pm	Jeff Mitman
Sat-Sun	4/9-4/10	11pm - 7am	Alex Velazquez-Lozada

BWR Expertise**Email: RST11**

Sat-Sun	4/2-4/3	11pm - 7am	Eva Brown
Sun	3-Apr	7am - 3pm	Larry Vick
Sun	3-Apr	3pm-11pm	Chuck Norton
Sun-Mon	4/3-4/4	11pm - 7am	Eva Brown
Mon	4-Apr	7am - 3pm	Mike Brown
Mon	4-Apr	3pm-11pm	Chuck Norton
Mon-Tue	4/4-4/5	11pm - 7am	Eva Brown
Tue	5-Apr	7am - 3pm	Peter Alter
Tue	5-Apr	3pm-11pm	Chuck Norton
Tue-Wed	4/5-4/6	11pm - 7am	Eva Brown
Wed	6-Apr	7am - 3pm	Mike Brown

Japan Earthquake ERO Staffing Roster

April 3-9, 2011

Pay Period 8 - Week 2

Wed	6-Apr	3pm-11pm	Chuck Norton
Wed-Thur	4/6-4/7	11pm - 7am	Eva Brown
Thur	7-Apr	7am - 3pm	Mike Brown
Thur	7-Apr	3pm-11pm	Chuck Norton
Thur-Fri	4/7-4/8	11pm - 7am	Eva Brown
Fri	8-Apr	7am - 3pm	Mike Brown
Fri	8-Apr	3pm-11pm	Chuck Norton
Fri-Sat	4/8-4/9	11pm-7am	Eva Brown
Sat	9-Apr	7am - 3pm	Mike Brown
Sat	9-Apr	3pm-11pm	Chuck Norton
Sat-Sun	4/9-4/10	11pm - 7am	Greg Cranston

RST Comm/ERDS Operator**Email: RST16**

Sat-Sun	4/2-4/3	11pm - 7am	Margie Kotzalas
Sun	3-Apr	7am - 3pm	Mark Padovan
Sun	3-Apr	3pm-11pm	Andy Kugler
Sun-Mon	4/3-4/4	11pm - 7am	Rosemary Reeves
Mon	4-Apr	7am - 3pm	Donna Williams
Mon	4-Apr	3pm-11pm	John Thorp
Mon-Tue	4/4-4/5	11pm - 7am	Rollie Berry
Tue	5-Apr	7am - 3pm	Mark Padovan
Tue	5-Apr	3pm-11pm	Andy Kugler
Tue-Wed	4/5-4/6	11pm - 7am	Rollie Berry
Wed	6-Apr	7am - 3pm	Steve Bloom
Wed	6-Apr	3pm-11pm	Mark Padovan
Wed-Thur	4/6-4/7	11pm - 7am	Rollie Berry
Thur	7-Apr	7am - 3pm	Rick Jervey
Thur	7-Apr	3pm-11pm	John Thorp
Thur-Fri	4/7-4/8	11pm - 7am	Rollie Berry
Fri	8-Apr	7am - 3pm	Mark Padovan
Fri	8-Apr	3pm-11pm	Rosemary Reeves
Fri-Sat	4/8-4/9	11pm-7am	Jon Thompson
Sat	9-Apr	7am - 3pm	Mark Padovan
Sat	9-Apr	3pm-11pm	Rick Jervey
Sat-Sun	4/9-4/10	11pm - 7am	Liliana Ramadan

RST Support (Seismology Q&A)

Fri-Sat	4/1-4/2	11pm-7am	(On Call)
Sat	2-Apr	7am - 3pm	(On Call)
Sat	2-Apr	3pm-11pm	(On Call)
Sat-Sun	4/2-4/3	11pm - 7am	(On Call)
Sun	3-Apr	7am - 3pm	(On Call)
Sun	3-Apr	3pm-11pm	(On Call)
Sun-Mon	4/3-4/4	11pm - 7am	(On Call)
Mon	4-Apr	7am - 3pm	(On Call)
Mon	4-Apr	3pm-11pm	(On Call)
Mon-Tue	4/4-4/5	11pm - 7am	(On Call)
Tue	5-Apr	7am - 3pm	(On Call)
Tue	5-Apr	3pm-11pm	(On Call)
Tue-Wed	4/5-4/6	11pm - 7am	(On Call)
Wed	6-Apr	7am - 3pm	(On Call)

Japan Earthquake ERO Staffing Roster

April 3-9, 2011

Pay Period 8 - Week 2

Wed	6-Apr	3pm-11pm	(On Call)
Wed-Thur	4/6-4/7	11pm - 7am	(On Call)
Thur	7-Apr	7am - 3pm	(On Call)
Thur	7-Apr	3pm-11pm	(On Call)
Thur-Fri	4/7-4/8	11pm - 7am	(On Call)
Fri	8-Apr	7am - 3pm	(On Call)
Fri	8-Apr	3pm-11pm	(On Call)
Fri-Sat	4/8-4/9	11pm-7am	(On Call)
Sat	9-Apr	7am - 3pm	(On Call)
Sat	9-Apr	3pm-11pm	(On Call)
Sat-Sun	4/9-4/10	11pm - 7am	(On Call)

RST Support (Structural)

Fri-Sat	4/1-4/2	11pm-7am	(On Call) Pravin Patel
Sat	2-Apr	7am - 3pm	(On Call) Pravin Patel
Sat	2-Apr	3pm-11pm	(On Call) Pravin Patel
Sat-Sun	4/2-4/3	11pm - 7am	(On Call) Pravin Patel
Sun	3-Apr	7am - 3pm	(On Call) Pravin Patel
Sun	3-Apr	3pm-11pm	(On Call) Pravin Patel
Sun-Mon	4/3-4/4	11pm - 7am	(On Call) Pravin Patel
Mon	4-Apr	7am - 3pm	(On Call) Pravin Patel
Mon	4-Apr	3pm-11pm	(On Call) Pravin Patel
Mon-Tues	4/4-4/5	11pm - 7am	(On Call) Pravin Patel
Tues	5-Apr	7am - 3pm	(On Call) Pravin Patel
Tues	5-Apr	3pm-11pm	(On Call) Pravin Patel
Tues-Wed	4/5-4/6	11pm - 7am	(On Call) Pravin Patel
Wed	6-Apr	7am - 3pm	(On Call) Pravin Patel
Wed	6-Apr	3pm-11pm	(On Call) Pravin Patel
Wed-Thur	4/6-4/7	11pm - 7am	(On Call) Pravin Patel
Thur	7-Apr	7am - 3pm	(On Call) Pravin Patel
Thur	7-Apr	3pm-11pm	(On Call) Pravin Patel
Thur-Fri	4/7-4/8	11pm - 7am	(On Call) Pravin Patel
Fri	8-Apr	7am - 3pm	(On Call) Pravin Patel
Fri	8-Apr	3pm-11pm	(On Call) Pravin Patel
Fri-Sat	4/8-4/9	11pm-7am	(On Call) Pravin Patel

Japan Earthquake ERO Staffing Roster
April 10-16, 2011
Pay Period 9 - Week 1

Position	Date	Time	Staff
Executive Team			
ET Director			
Sat-Sun	4/9-4/10	11pm - 7am	Jennifer Uhle
Sun	10-Apr	7am - 3pm	Jim Dyer
Sun	10-Apr	3pm-11pm	Cynthia Carpenter
Sun-Mon	4/10-4/11	11pm - 7am	Jennifer Uhle
Mon	11-Apr	7am - 3pm	Jim Dyer
Mon	11-Apr	3pm-11pm	Cynthia Carpenter
Mon-Tue	4/11-12/5	11pm - 7am	Jim Wiggins
Tue	12-Apr	7am - 3pm	Jim Dyer
Tue	12-Apr	3pm-11pm	Cynthia Carpenter
Tue-Wed	4/12-13/6	11pm - 7am	Jim Wiggins
Wed	13-Apr	7am - 3pm	Jim Dyer
Wed	13-Apr	3pm-11pm	Bruce Boger
Wed-Thur	4/13-4/14	11pm - 7am	
Thur	14-Apr	7am - 3pm	Roy Zimmerman
Thur	14-Apr	3pm-11pm	Bruce Boger
Thur-Fri	4/14-4/15	11pm - 7am	
Fri	15-Apr	7am - 3pm	Roy Zimmerman
Fri	15-Apr	3pm-11pm	Bruce Boger
Fri-Sat	4/15-4/16	11pm-7am	
ET Response Advisor			
Sat-Sun	4/9-4/10	11pm - 7am	Mark Thaggard
Sun	10-Apr	7am - 3pm	Mike Layton
Sun	10-Apr	3pm-11pm	Tom Blount
Sun-Mon	4/10-4/11	11pm - 7am	Joe Holonich
Mon	11-Apr	7am - 3pm	Mike Layton
Mon	11-Apr	3pm-11pm	Tom Blount
Mon-Tue	4/11-12/5	11pm - 7am	Joe Holonich
Tue	12-Apr	7am - 3pm	Joe Giitter
Tue	12-Apr	3pm-11pm	Tom Blount
Tue-Wed	4/12-13/6	11pm - 7am	Joe Holonich
Wed	13-Apr	7am - 3pm	Joe Giitter
Wed	13-Apr	3pm-11pm	Tom Blount
Wed-Thur	4/13-4/14	11pm - 7am	Scott Morris
Thur	14-Apr	7am - 3pm	Joe Giitter
Thur	14-Apr	3pm-11pm	Mark Thaggard
Thur-Fri	4/14-4/15	11pm - 7am	Scott Morris
Fri	15-Apr	7am - 3pm	
Fri	15-Apr	3pm-11pm	Mark Thaggard
Fri-Sat	4/15-4/16	11pm-7am	Scott Morris
ET Rx Prot Measures & State Coordinator			
Sat-Sun	4/9-4/10	11pm - 7am	N/A

Japan Earthquake ERO Staffing Roster

April 10-16, 2011

Pay Period 9 - Week 1

Sun	10-Apr	7am - 3pm	N/A
Sun	10-Apr	3pm-11pm	N/A
Sun-Mon	4/10-4/11	11pm - 7am	N/A
Mon	11-Apr	7am - 3pm	N/A
Mon	11-Apr	3pm-11pm	N/A
Mon-Tue	4/11-12/5	11pm - 7am	N/A
Tue	12-Apr	7am - 3pm	N/A
Tue	12-Apr	3pm-11pm	N/A
Tue-Wed	4/12-13/6	11pm - 7am	N/A
Wed	13-Apr	7am - 3pm	N/A
Wed	13-Apr	3pm-11pm	N/A
Wed-Thur	4/13-4/14	11pm - 7am	N/A
Thur	14-Apr	7am - 3pm	N/A
Thur	14-Apr	3pm-11pm	N/A
Thur-Fri	4/14-4/15	11pm - 7am	N/A
Fri	15-Apr	7am - 3pm	N/A
Fri	15-Apr	3pm-11pm	N/A
Fri-Sat	4/15-4/16	11pm-7am	N/A

Executive Briefing Team**EBT Admin. Assistant****Email: OST04**

Sat-Sun	4/9-4/10	11pm - 7am	N/A
Sun	10-Apr	7am - 3pm	N/A
Sun	10-Apr	3pm-11pm	Andrea Wimbush
Sun-Mon	4/10-4/11	11pm - 7am	N/A
Mon	11-Apr	7am - 3pm	N/A
Mon	11-Apr	3pm-11pm	Louise Lovell
Mon-Tue	4/11-12/5	11pm - 7am	N/A
Tue	12-Apr	7am - 3pm	N/A
Tue	12-Apr	3pm-11pm	Andrea Wimbush
Tue-Wed	4/12-13/6	11pm - 7am	N/A
Wed	13-Apr	7am - 3pm	N/A
Wed	13-Apr	3pm-11pm	Andrea Wimbush
Wed-Thur	4/13-4/14	11pm - 7am	N/A
Thur	14-Apr	7am - 3pm	N/A
Thur	14-Apr	3pm-11pm	Louise Lovell
Thur-Fri	4/14-4/15	11pm - 7am	N/A
Fri	15-Apr	7am - 3pm	N/A
Fri	15-Apr	3pm-11pm	Annette Stang
Fri-Sat	4/15-4/16	11pm-7am	N/A

EBT Coordinator**Email: LIA07**

Sat-Sun	4/9-4/10	11pm - 7am	Jim Anderson
Sun	10-Apr	7am - 3pm	N/A
Sun	10-Apr	3pm-11pm	Jeremy Susco
Sun-Mon	4/10-4/11	11pm - 7am	

Japan Earthquake ERO Staffing Roster

April 10-16, 2011

Pay Period 9 - Week 1

Mon	11-Apr	7am - 3pm	N/A
Mon	11-Apr	3pm-11pm	Sara Mroz
Mon-Tue	4/11-12/5	11pm - 7am	
Tue	12-Apr	7am - 3pm	N/A
Tue	12-Apr	3pm-11pm	
Tue-Wed	4/12-13/6	11pm - 7am	
Wed	13-Apr	7am - 3pm	N/A
Wed	13-Apr	3pm-11pm	Sara Mroz
Wed-Thur	4/13-4/14	11pm - 7am	Jim Anderson
Thur	14-Apr	7am - 3pm	N/A
Thur	14-Apr	3pm-11pm	
Thur-Fri	4/14-4/15	11pm - 7am	Jim Anderson
Fri	15-Apr	7am - 3pm	N/A
Fri	15-Apr	3pm-11pm	
Fri-Sat	4/15-4/16	11pm-7am	Jim Anderson

Executive Support Team**EST Status Officer****Email: ET07**

Sat-Sun	4/9-4/10	11pm - 7am	Jeff Grant
Sun	10-Apr	7am - 3pm	Jane Marshall
Sun	10-Apr	3pm-11pm	Bill Gott
Sun-Mon	4/10-4/11	11pm - 7am	Jeff Grant
Mon	11-Apr	7am - 3pm	Jane Marshall
Mon	11-Apr	3pm-11pm	Bill Gott
Mon-Tue	4/11-12/5	11pm - 7am	Jeff Grant
Tue	12-Apr	7am - 3pm	Jane Marshall
Tue	12-Apr	3pm-11pm	Sally Billings
Tue-Wed	4/12-13/6	11pm - 7am	Jeff Grant
Wed	13-Apr	7am - 3pm	Jane Marshall
Wed	13-Apr	3pm-11pm	Sally Billings
Wed-Thur	4/13-4/14	11pm - 7am	Jeff Grant
Thur	14-Apr	7am - 3pm	Jane Marshall
Thur	14-Apr	3pm-11pm	Bill Gott
Thur-Fri	4/14-4/15	11pm - 7am	Jeff Grant
Fri	15-Apr	7am - 3pm	Jane Marshall
Fri	15-Apr	3pm-11pm	Bill Gott
Fri-Sat	4/15-4/16	11pm-7am	Jeff Grant

EST Actions Officer**Email: ET05**

Sat-Sun	4/9-4/10	11pm - 7am	N/A
Sun	10-Apr	7am - 3pm	N/A
Sun	10-Apr	3pm-11pm	N/A
Sun-Mon	4/10-4/11	11pm - 7am	N/A
Mon	11-Apr	7am - 3pm	
Mon	11-Apr	3pm-11pm	N/A
Mon-Tue	4/11-12/5	11pm - 7am	N/A

Japan Earthquake ERO Staffing Roster

April 10-16, 2011

Pay Period 9 - Week 1

Tue	12-Apr	7am - 3pm	
Tue	12-Apr	3pm-11pm	N/A
Tue-Wed	4/12-13/6	11pm - 7am	N/A
Wed	13-Apr	7am - 3pm	
Wed	13-Apr	3pm-11pm	N/A
Wed-Thur	4/13-4/14	11pm - 7am	N/A
Thur	14-Apr	7am - 3pm	
Thur	14-Apr	3pm-11pm	N/A
Thur-Fri	4/14-4/15	11pm - 7am	N/A
Fri	15-Apr	7am - 3pm	Don Algama
Fri	15-Apr	3pm-11pm	N/A
Fri-Sat	4/15-4/16	11pm-7am	N/A
EST Coordinator Email: OST01			
Sat-Sun	4/9-4/10	11pm - 7am	Clyde Ragland
Sun	10-Apr	7am - 3pm	Melissa Ralph
Sun	10-Apr	3pm-11pm	Tony McMurtray
Sun-Mon	4/10-4/11	11pm - 7am	Cynthia Dorsey
Mon	11-Apr	7am - 3pm	Stephen Campbell
Mon	11-Apr	3pm-11pm	
Mon-Tue	4/11-4/12	11pm - 7am	Rebecca Stone
Tue	12-Apr	7am - 3pm	Tony Bowers
Tue	12-Apr	3pm-11pm	Cynthia Dorsey
Tue-Wed	4/12-4/13	11pm - 7am	Rebecca Stone
Wed	13-Apr	7am - 3pm	Tony Bowers
Wed	13-Apr	3pm-11pm	Jeff Kowalczyk
Wed-Thur	4/13-4/14	11pm - 7am	Rebecca Stone
Thur	14-Apr	7am - 3pm	Tony Bowers
Thur	14-Apr	3pm-11pm	Carolyn Faria
Thur-Fri	4/14-4/15	11pm - 7am	Rebecca Stone
Fri	15-Apr	7am - 3pm	Stephen Campbell
Fri	15-Apr	3pm-11pm	Tony Bowers
Fri-Sat	4/15-4/16	11pm-7am	
EST Chronology Officer Email: ET02			
Sat-Sun	4/9-4/10	11pm - 7am	Nick Ballam
Sun	10-Apr	7am - 3pm	Cornelia Burkhalter
Sun	10-Apr	3pm-11pm	Rebecca Karas
Sun-Mon	4/10-4/11	11pm - 7am	Nick Ballam
Mon	11-Apr	7am - 3pm	
Mon	11-Apr	3pm-11pm	Rebecca Karas
Mon-Tue	4/11-12/5	11pm - 7am	Nick Ballam
Tue	12-Apr	7am - 3pm	
Tue	12-Apr	3pm-11pm	Rebecca Karas
Tue-Wed	4/12-13/6	11pm - 7am	Nick Ballam
Wed	13-Apr	7am - 3pm	Jessica Kratchman

Japan Earthquake ERO Staffing Roster

April 10-16, 2011

Pay Period 9 - Week 1

Wed	13-Apr	3pm-11pm	Rebecca Karas
Wed-Thur	4/13-4/14	11pm - 7am	Nick Ballam
Thur	14-Apr	7am - 3pm	
Thur	14-Apr	3pm-11pm	Rebecca Karas
Thur-Fri	4/14-4/15	11pm - 7am	Nick Ballam
Fri	15-Apr	7am - 3pm	Jessica Kratchman
Fri	15-Apr	3pm-11pm	Rebecca Karas
Fri-Sat	4/15-4/16	11pm-7am	Nick Ballam
EST Response Ops Mgr			
Email: ET03			
Sat-Sun	4/9-4/10	11pm - 7am	Cris Brown
Sun	10-Apr	7am - 3pm	Karen Jackson
Sun	10-Apr	3pm-11pm	Sandra Valencia/Nick Ballam
Sun-Mon	4/10-4/11	11pm - 7am	Cris Brown
Mon	11-Apr	7am - 3pm	Karen Jackson
Mon	11-Apr	3pm-11pm	Jean Trefethen
Mon-Tue	4/11-12/5	11pm - 7am	Omar Khan
Tue	12-Apr	7am - 3pm	Karen Jackson
Tue	12-Apr	3pm-11pm	Beza Alemu
Tue-Wed	4/12-13/6	11pm - 7am	Omar Khan
Wed	13-Apr	7am - 3pm	May Cheng
Wed	13-Apr	3pm-11pm	Karen Jackson
Wed-Thur	4/13-4/14	11pm - 7am	Jean Trefethen
Thur	14-Apr	7am - 3pm	May Cheng
Thur	14-Apr	3pm-11pm	Omar Khan
Thur-Fri	4/14-4/15	11pm - 7am	Jean Trefethen
Fri	15-Apr	7am - 3pm	Karen Jackson
Fri	15-Apr	3pm-11pm	Omar Khan
Fri-Sat	4/15-4/16	11pm-7am	Jean Trefethen
EST Admin. Assistant			
Email: OST02			
Sat-Sun	4/9-4/10	11pm - 7am	N/A
Sun	10-Apr	7am - 3pm	N/A
Sun	10-Apr	3pm-11pm	N/A
Sun-Mon	4/10-4/11	11pm - 7am	N/A
Mon	11-Apr	7am - 3pm	N/A
Mon	11-Apr	3pm-11pm	N/A
Mon-Tue	4/11-4/12	11pm - 7am	N/A
Tue	12-Apr	7am - 3pm	N/A
Tue	12-Apr	3pm-11pm	N/A
Tue-Wed	4/12-13/6	11pm - 7am	N/A
Wed	13-Apr	7am - 3pm	N/A
Wed	13-Apr	3pm-11pm	N/A
Wed-Thur	4/13-4/14	11pm - 7am	N/A
Thur	14-Apr	7am - 3pm	N/A
Thur	14-Apr	3pm-11pm	N/A

Japan Earthquake ERO Staffing Roster
April 10-16, 2011
Pay Period 9 - Week 1

Thur-Fri	4/14-4/15	11pm - 7am	N/A
Fri	15-Apr	7am - 3pm	N/A
Fri	15-Apr	3pm-11pm	N/A
Fri-Sat	4/15-4/16	11pm-7am	N/A
Liaison Team			
LT Director		Email: LIA06	
Sat-Sun	4/9-4/10	11pm - 7am	N/A
Sun	10-Apr	7am - 3pm	Mark Thaggard
Sun	10-Apr	3pm-11pm	Allen Howe
Sun-Mon	4/10-4/11	11pm - 7am	N/A
Mon	11-Apr	7am - 3pm	Rich Correia
Mon	11-Apr	3pm-11pm	Bob Webber
Mon-Tue	4/11-12/5	11pm - 7am	N/A
Tue	12-Apr	7am - 3pm	Marissa Bailey
Tue	12-Apr	3pm-11pm	Bob Webber
Tue-Wed	4/12-13/6	11pm - 7am	N/A
Wed	13-Apr	7am - 3pm	Rich Correia
Wed	13-Apr	3pm-11pm	Bob Webber
Wed-Thur	4/13-4/14	11pm - 7am	N/A
Thur	14-Apr	7am - 3pm	Rich Correia
Thur	14-Apr	3pm-11pm	Bob Webber
Thur-Fri	4/14-4/15	11pm - 7am	N/A
Fri	15-Apr	7am - 3pm	
Fri	15-Apr	3pm-11pm	
Fri-Sat	4/15-4/16	11pm-7am	N/A
LT Coordinator			
Email: LIA08			
Sat-Sun	4/9-4/10	11pm - 7am	Rani Franovich
Sun	10-Apr	7am - 3pm	Lisa Wright
Sun	10-Apr	3pm-11pm	Milt Murray
Sun-Mon	4/10-4/11	11pm - 7am	Jeff Temple
Mon	11-Apr	7am - 3pm	Lisa Wright
Mon	11-Apr	3pm-11pm	Clyde Ragland
Mon-Tue	4/11-12/5	11pm - 7am	Jeff Temple
Tue	12-Apr	7am - 3pm	Lisa Wright
Tue	12-Apr	3pm-11pm	Clyde Ragland
Tue-Wed	4/12-13/6	11pm - 7am	Jeff Temple
Wed	13-Apr	7am - 3pm	Joe Rivers
Wed	13-Apr	3pm-11pm	Lisa Wright
Wed-Thur	4/13-4/14	11pm - 7am	Jeff Temple
Thur	14-Apr	7am - 3pm	Joe Rivers
Thur	14-Apr	3pm-11pm	Rani Franovich
Thur-Fri	4/14-4/15	11pm - 7am	Janelle Jessie
Fri	15-Apr	7am - 3pm	Milt Murray
Fri	15-Apr	3pm-11pm	Jeff Temple

Japan Earthquake ERO Staffing Roster
April 10-16, 2011
Pay Period 9 - Week 1

Fri-Sat	4/15-4/16	11pm-7am	Rani Franovich
LT State Liaison			
Email: LIA04/OST05			
Sat-Sun	4/9-4/10	9pm-7am	Amanda Noonan (On Call)
Sun	10-Apr	7am-2pm	Amanda Noonan (On Call)
Sun	10-Apr	2pm-9pm	Amanda Noonan (On Call)
Sun-Mon	4/10-4/11	9pm-7am	Amanda Noonan (On Call)
Mon	11-Apr	7am-2pm	Alison Rivera
Mon	11-Apr	2pm-9pm	Stuart Eason
Mon-Tue	4/11-4/12	9pm-7am	Amanda Noonan (On Call)
Tue	12-Apr	7am-2pm	Cardelia Maupin
Tue	12-Apr	2pm-9pm	Stuart Eason
Tue-Wed	4/12-4/13	9pm-7am	Alison Rivera (On Call)
Wed	13-Apr	7am-2pm	Amanda Noonan
Wed	13-Apr	2pm-9pm	Richard Turtill
Wed-Thur	4/13-4/14	9pm-7am	Alison Rivera (On Call)
Thur	14-Apr	7am-2pm	Cindy Flannery
Thur	14-Apr	2pm-9pm	Michelle Ryan
Thur-Fri	4/14-4/15	9pm-7am	Amanda Noonan (On Call)
Fri	15-Apr	7am-2pm	Kim Lukes
Fri	15-Apr	2pm-9pm	Amanda Noonan
Fri-Sat	4/15-4/16	9pm-7am	Amanda Noonan (On Call)
LT Federal Liaison			
Email: LIA01/LIA11			
Sat-Sun	4/9-4/10	11pm - 7am	Scott Sloan
Sun	10-Apr	7am - 3pm	Russ Chazell
Sun	10-Apr	3pm-11pm	Jeff Lynch
Sun-Mon	4/10-4/11	11pm - 7am	Ned Wright
Mon	11-Apr	7am - 3pm	Beth Reed
Mon	11-Apr	3pm-11pm	Jerry Hale
Mon-Tue	4/11-12/5	11pm - 7am	Ned Wright
Tue	12-Apr	7am - 3pm	Beth Reed
Tue	12-Apr	3pm-11pm	Jeff Lynch
Tue-Wed	4/12-13/6	11pm - 7am	Ned Wright
Wed	13-Apr	7am - 3pm	Russ Chazell
Wed	13-Apr	3pm-11pm	Jeff Lynch
Wed-Thur	4/13-4/14	11pm - 7am	Susan Salter
Thur	14-Apr	7am - 3pm	Jason Lising
Thur	14-Apr	3pm-11pm	Russ Chazell
Thur-Fri	4/14-4/15	11pm - 7am	Susan Salter
Fri	15-Apr	7am - 3pm	Russ Chazell
Fri	15-Apr	3pm-11pm	Jerry Hale
Fri-Sat	4/15-4/16	11pm-7am	Susan Salter
LT Congressional Liaison (2)			
Email: LIA12			
Sat	9-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)

Japan Earthquake ERO Staffing Roster

April 10-16, 2011

Pay Period 9 - Week 1

Sat	9-Apr	2pm-9pm	Amy Powell (ON CALL ONLY)
Sun	10-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)
Sun	10-Apr	2pm-9pm	Amy Powell (ON CALL ONLY)
Mon	11-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)
Mon	11-Apr	2pm-9pm	Amy Powell (ON CALL ONLY)
Tue	12-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)
Tue	12-Apr	2pm-9pm	Amy Powell (ON CALL ONLY)
Wed	13-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)
Wed	13-Apr	2pm-9pm	Amy Powell (ON CALL ONLY)
Thur	14-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)
Thur	14-Apr	2pm-9pm	Amy Powell (ON CALL ONLY)
Fri	15-Apr	7am - 2pm	Amy Powell (ON CALL ONLY)
Fri	15-Apr	2pm-9pm	Amy Powell (ON CALL ONLY)

LT International Liaison (2) Email: LIA02/LIA03/LIA10

Sat-Sun	4/9-4/10	11pm - 7am	Danielle/Lauren
Sun	10-Apr	7am - 3pm	Eric/Mugeh
Sun	10-Apr	3pm-11pm	Jen S./Charlotte
Sun-Mon	4/10-4/11	11pm - 7am	Danielle/Lauren
Mon	11-Apr	7am - 3pm	Steve Bloom/Lance
Mon	11-Apr	3pm-11pm	Janice/Jenny
Mon-Tue	4/11-12/5	11pm - 7am	Gerri / Elizabeth
Tue	12-Apr	7am - 3pm	Steve Bloom/Lance
Tue	12-Apr	3pm-11pm	Janice/Jenny
Tue-Wed	4/12-13/6	11pm - 7am	/ Elizabeth
Wed	13-Apr	7am - 3pm	Steve Bloom/Lance
Wed	13-Apr	3pm-11pm	Janice/Jenny
Wed-Thur	4/13-4/14	11pm - 7am	Gerri / Elizabeth
Thur	14-Apr	7am - 3pm	Steve Baker/Brian
Thur	14-Apr	3pm-11pm	Jill/Karen
Thur-Fri	4/14-4/15	11pm - 7am	Skip/Nancy
Fri	15-Apr	7am - 3pm	Steve Baker/Brian
Fri	15-Apr	3pm-11pm	Jill/Karen
Fri-Sat	4/15-4/16	11pm-7am	Skip/Nancy

Protective Measures Team**PMTR Director Email: PMT12**

Sat-Sun	4/9-4/10	11pm - 7am	Kathy Gibson
Sun	10-Apr	7am - 3pm	
Sun	10-Apr	3pm-11pm	
Sun-Mon	4/10-4/11	11pm - 7am	N/A
Mon	11-Apr	7am - 3pm	Kathy Gibson
Mon	11-Apr	3pm-11pm	
Mon-Tue	4/11-12/5	11pm - 7am	N/A
Tue	12-Apr	7am - 3pm	Trish Holahan
Tue	12-Apr	3pm-11pm	

Japan Earthquake ERO Staffing Roster

April 10-16, 2011

Pay Period 9 - Week 1

Tue-Wed	4/12-13/6	11pm - 7am	N/A
Wed	13-Apr	7am - 3pm	Trish Holahan
Wed	13-Apr	3pm-11pm	
Wed-Thur	4/13-4/14	11pm - 7am	N/A
Thur	14-Apr	7am - 3pm	Kathy Gibson
Thur	14-Apr	3pm-11pm	
Thur-Fri	4/14-4/15	11pm - 7am	N/A
Fri	15-Apr	7am - 3pm	Kathy Gibson
Fri	15-Apr	3pm-11pm	Donald Cool
Fri-Sat	4/15-4/16	11pm-7am	N/A

PMTR Coordinator**Email: PMT09**

Sat-Sun	4/9-4/10	11pm - 7am	Kimyata MorganButler
Sun	10-Apr	7am - 3pm	Nima Ashkeboussi
Sun	10-Apr	3pm-11pm	Ryan Craffey
Sun-Mon	4/10-4/11	11pm - 7am	Lou Brandon
Mon	11-Apr	7am - 3pm	Arlon Costa
Mon	11-Apr	3pm-11pm	Nima Ashkeboussi
Mon-Tue	4/11-12/5	11pm - 7am	Lou Brandon
Tue	12-Apr	7am - 3pm	Arlon Costa
Tue	12-Apr	3pm-11pm	
Tue-Wed	4/12-13/6	11pm - 7am	Lou Brandon
Wed	13-Apr	7am - 3pm	Sujata Goetz/Prosanta Chowdhury
Wed	13-Apr	3pm-11pm	Ryan Craffey
Wed-Thur	4/13-4/14	11pm - 7am	
Thur	14-Apr	7am - 3pm	Duane Hardesty
Thur	14-Apr	3pm-11pm	
Thur-Fri	4/14-4/15	11pm - 7am	Lou Brandon
Fri	15-Apr	7am - 3pm	Duane Hardesty
Fri	15-Apr	3pm-11pm	Ryan Craffey
Fri-Sat	4/15-4/16	11pm-7am	Lou Brandon

PMTR Prot Actions Asst Dir**Email: PMT12**

Sat-Sun	4/9-4/10	11pm - 7am	Jessica Kratchman
Sun	10-Apr	7am - 3pm	Kathy Brock
Sun	10-Apr	3pm-11pm	Stacey Rosenberg
Sun-Mon	4/10-4/11	11pm - 7am	Greg Casto
Mon	11-Apr	7am - 3pm	Kathy Brock
Mon	11-Apr	3pm-11pm	Stacey Rosenberg
Mon-Tue	4/11-12/5	11pm - 7am	Greg Casto
Tue	12-Apr	7am - 3pm	Kathy Brock
Tue	12-Apr	3pm-11pm	Stacey Rosenberg
Tue-Wed	4/12-13/6	11pm - 7am	Greg Casto
Wed	13-Apr	7am - 3pm	Kathy Brock
Wed	13-Apr	3pm-11pm	Sandra Wastler
Wed-Thur	4/13-4/14	11pm - 7am	Greg Casto

Japan Earthquake ERO Staffing Roster

April 10-16, 2011

Pay Period 9 - Week 1

Thur	14-Apr	7am - 3pm	Kathy Brock
Thur	14-Apr	3pm-11pm	Stacey Rosenberg
Thur-Fri	4/14-4/15	11pm - 7am	
Fri	15-Apr	7am - 3pm	Sandra Wastler
Fri	15-Apr	3pm-11pm	Stacey Rosenberg
Fri-Sat	4/15-4/16	11pm-7am	

PMTR RAAD**Email: PMT05**

Sat-Sun	4/9-4/10	11pm - 7am	Mike Norris
Sun	10-Apr	7am - 3pm	Don Johnson
Sun	10-Apr	3pm-11pm	
Sun-Mon	4/10-4/11	11pm - 7am	Mike Norris
Mon	11-Apr	7am - 3pm	Steve LaVie
Mon	11-Apr	3pm-11pm	Michelle Hart
Mon-Tue	4/11-12/5	11pm - 7am	Mike Norris
Tue	12-Apr	7am - 3pm	Leroy Hardin
Tue	12-Apr	3pm-11pm	Steve LaVie
Tue-Wed	4/12-13/6	11pm - 7am	Mike Norris
Wed	13-Apr	7am - 3pm	Stewart Schneider
Wed	13-Apr	3pm-11pm	Michelle Hart
Wed-Thur	4/13-4/14	11pm - 7am	Mike Norris
Thur	14-Apr	7am - 3pm	Leroy Hardin
Thur	14-Apr	3pm-11pm	Steve LaVie
Thur-Fri	4/14-4/15	11pm - 7am	Mike Norris
Fri	15-Apr	7am - 3pm	Stewart Schneider
Fri	15-Apr	3pm-11pm	Michelle Hart
Fri-Sat	4/15-4/16	11pm-7am	

PMTR Dose Assessment (RASCAL) - Need 2 people/day**Email: PMT02/PMT11**

Sat-Sun	4/9-4/10	11pm - 7am	Stephanie Bush-Goddard/Ed Roach
Sun	10-Apr	7am - 3pm	Tony Huffert/John Tomon
Sun	10-Apr	3pm-11pm	Fritz Sturz/Casper Sun
Sun-Mon	4/10-4/11	11pm - 7am	John Parillo/
Mon	11-Apr	7am - 3pm	Tony Huffert/Rich Clement
Mon	11-Apr	3pm-11pm	Fritz Sturz/AJ Nosek
Mon-Tue	4/11-4/12	11pm - 7am	John Parillo/John Tomon
Tue	12-Apr	7am - 3pm	Tony Huffert/Rich Clement
Tue	12-Apr	3pm-11pm	Casper Sun/Fritz Sturz
Tue-Wed	4/12-4/13	11pm - 7am	
Wed	13-Apr	7am - 3pm	Tony Huffert/Rich Clement
Wed	13-Apr	3pm-11pm	Casper Sun/AJ Nosek
Wed-Thur	4/13-4/14	11pm - 7am	Fritz Sturz/John Parillo
Thur	14-Apr	7am - 3pm	Tony Huffert/Rich Clement
Thur	14-Apr	3pm-11pm	Kimberly Gambone/Casper Sun
Thur-Fri	4/14-4/15	11pm - 7am	John Parillo/
Fri	15-Apr	7am - 3pm	Ron Lavera/

Japan Earthquake ERO Staffing Roster

April 10-16, 2011

Pay Period 9 - Week 1

Fri	15-Apr	3pm-11pm	Casper Sun/AJ Nosek
Fri-Sat	4/15-4/16	11pm-7am	John Parrillo/
PMTR GIS Analyst		Email: GIS	
Sat-Sun	4/9-4/10	11pm - 7am	N/A
Sun	10-Apr	7am - 3pm	ON CALL ONLY
Sun	10-Apr	3pm-11pm	N/A
Sun-Mon	4/10-4/11	11pm - 7am	N/A
Mon	11-Apr	7am - 3pm	ON CALL ONLY
Mon	11-Apr	3pm-11pm	N/A
Mon-Tue	4/11-12/5	11pm - 7am	N/A
Tue	12-Apr	7am - 3pm	ON CALL ONLY
Tue	12-Apr	3pm-11pm	N/A
Tue-Wed	4/12-13/6	11pm - 7am	N/A
Wed	13-Apr	7am - 3pm	ON CALL ONLY
Wed	13-Apr	3pm-11pm	N/A
Wed-Thur	4/13-4/14	11pm - 7am	N/A
Thur	14-Apr	7am - 3pm	ON CALL ONLY
Thur	14-Apr	3pm-11pm	N/A
Thur-Fri	4/14-4/15	11pm - 7am	N/A
Fri	15-Apr	7am - 3pm	ON CALL ONLY
Fri	15-Apr	3pm-11pm	N/A
Fri-Sat	4/15-4/16	11pm-7am	N/A
PMTR Meteorologist		Email: PMT01	
Sat-Sun	4/9-4/10	11pm - 7am	N/A
Sun	10-Apr	7am - 3pm	ON CALL ONLY
Sun	10-Apr	3pm-11pm	N/A
Sun-Mon	4/10-4/11	11pm - 7am	N/A
Mon	11-Apr	7am - 3pm	ON CALL ONLY
Mon	11-Apr	3pm-11pm	N/A
Mon-Tue	4/11-12/5	11pm - 7am	N/A
Tue	12-Apr	7am - 3pm	ON CALL ONLY
Tue	12-Apr	3pm-11pm	N/A
Tue-Wed	4/12-13/6	11pm - 7am	N/A
Wed	13-Apr	7am - 3pm	ON CALL ONLY
Wed	13-Apr	3pm-11pm	N/A
Wed-Thur	4/13-4/14	11pm - 7am	N/A
Thur	14-Apr	7am - 3pm	ON CALL ONLY
Thur	14-Apr	3pm-11pm	N/A
Thur-Fri	4/14-4/15	11pm - 7am	N/A
Fri	15-Apr	7am - 3pm	ON CALL ONLY
Fri	15-Apr	3pm-11pm	N/A
Fri-Sat	4/15-4/16	11pm-7am	N/A
Reactor Safety Team			

Japan Earthquake ERO Staffing Roster
 April 10-16, 2011
 Pay Period 9 - Week 1

RST Director		Email: RST01	
Sat-Sun	4/9-4/10	11pm - 7am	Fred Brown
Sun	10-Apr	7am - 3pm	Ed Hackett
Sun	10-Apr	3pm-11pm	Allen Howe
Sun-Mon	4/10-4/11	11pm - 7am	Fred Brown
Mon	11-Apr	7am - 3pm	
Mon	11-Apr	3pm-11pm	Allen Howe
Mon-Tue	4/11-12/5	11pm - 7am	Pat Hiland
Tue	12-Apr	7am - 3pm	
Tue	12-Apr	3pm-11pm	Bill Ruland
Tue-Wed	4/12-13/6	11pm - 7am	Brian Holian
Wed	13-Apr	7am - 3pm	Stu Richards
Wed	13-Apr	3pm-11pm	Laura Dudes
Wed-Thur	4/13-4/14	11pm - 7am	Brian Holian
Thur	14-Apr	7am - 3pm	Stu Richards
Thur	14-Apr	3pm-11pm	Laura Dudes
Thur-Fri	4/14-4/15	11pm - 7am	Pat Hiland
Fri	15-Apr	7am - 3pm	Fred Brown
Fri	15-Apr	3pm-11pm	Stu Richards
Fri-Sat	4/15-4/16	11pm-7am	Ed Hackett
RST Coordinator		Email: RST01B	
Sat-Sun	4/9-4/10	11pm - 7am	Oleg Bukharin
Sun	10-Apr	7am - 3pm	Rick Hasselberg
Sun	10-Apr	3pm-11pm	Kerri Kavanagh
Sun-Mon	4/10-4/11	11pm - 7am	Joelle Starfos
Mon	11-Apr	7am - 3pm	Michelle Falgan
Mon	11-Apr	3pm-11pm	Tom Boyce
Mon-Tue	4/11-12/5	11pm - 7am	Rollie Berry
Tue	12-Apr	7am - 3pm	Peter Alter
Tue	12-Apr	3pm-11pm	Aixa Belen
Tue-Wed	4/12-13/6	11pm - 7am	Rollie Berry
Wed	13-Apr	7am - 3pm	Joe Williams
Wed	13-Apr	3pm-11pm	Aixa Belen
Wed-Thur	4/13-4/14	11pm - 7am	Rollie Berry
Thur	14-Apr	7am - 3pm	Eric Thomas
Thur	14-Apr	3pm-11pm	Brett Rini
Thur-Fri	4/14-4/15	11pm - 7am	Oleg Bukharin
Fri	15-Apr	7am - 3pm	Peter Alter
Fri	15-Apr	3pm-11pm	Brett Rini
Fri-Sat	4/15-4/16	11pm-7am	Margie Kotzalas
Severe Accident/PRA		Email: RST10	
Sat-Sun	4/9-4/10	11pm - 7am	Velazquez - Lozada
Sun	10-Apr	7am - 3pm	SM Wong
Sun	10-Apr	3pm-11pm	Raj Iyengar

Japan Earthquake ERO Staffing Roster
April 10-16, 2011
Pay Period 9 - Week 1

Sun-Mon	4/10-4/11	11pm - 7am	Larry Criscione
Mon	11-Apr	7am - 3pm	Len Ward
Mon	11-Apr	3pm-11pm	Mark Caruso
Mon-Tue	4/11-12/5	11pm - 7am	Larry Criscione
Tue	12-Apr	7am - 3pm	Ben Beasley
Tue	12-Apr	3pm-11pm	Antonios Zoulis
Tue-Wed	4/12-13/6	11pm - 7am	Larry Criscione
Wed	13-Apr	7am - 3pm	Mark Caruso
Wed	13-Apr	3pm-11pm	Antonio Zoulis
Wed-Thur	4/13-4/14	11pm - 7am	Hanh Phan
Thur	14-Apr	7am - 3pm	Tina Ghosh
Thur	14-Apr	3pm-11pm	Antonios Zoulis
Thur-Fri	4/14-4/15	11pm - 7am	Ben Beasley
Fri	15-Apr	7am - 3pm	Raj Iyengar
Fri	15-Apr	3pm-11pm	Antonios Zoulis
Fri-Sat	4/15-4/16	11pm-7am	Larry Criscione

BWR Expertise

Email: RST11

Sat-Sun	4/9-4/10	11pm - 7am	Greg Cranston
Sun	10-Apr	7am - 3pm	Larry Vick
Sun	10-Apr	3pm-11pm	Tim Kolb
Sun-Mon	4/10-4/11	11pm - 7am	Greg Cranston
Mon	11-Apr	7am - 3pm	Mike Brown
Mon	11-Apr	3pm-11pm	Tim Kolb
Mon-Tue	4/11-12/5	11pm - 7am	Eva Brown
Tue	12-Apr	7am - 3pm	Mike Brown
Tue	12-Apr	3pm-11pm	Tim Kolb
Tue-Wed	4/12-13/6	11pm - 7am	Eva Brown
Wed	13-Apr	7am - 3pm	Mike Brown
Wed	13-Apr	3pm-11pm	Tim Kolb
Wed-Thur	4/13-4/14	11pm - 7am	Eva Brown
Thur	14-Apr	7am - 3pm	Mike Brown
Thur	14-Apr	3pm-11pm	Chuck Norton
Thur-Fri	4/14-4/15	11pm - 7am	Eva Brown
Fri	15-Apr	7am - 3pm	Greg Cranston
Fri	15-Apr	3pm-11pm	Chuck Norton
Fri-Sat	4/15-4/16	11pm-7am	Eva Brown

RST Comm/ERDS Operator

Email: RST16

Sat-Sun	4/9-4/10	11pm - 7am	Liliana Ramadan
Sun	10-Apr	7am - 3pm	Jim Isom
Sun	10-Apr	3pm-11pm	Bill Roggenbrodt
Sun-Mon	4/10-4/11	11pm - 7am	Margie Kotzalas
Mon	11-Apr	7am - 3pm	Jim Isom
Mon	11-Apr	3pm-11pm	Andy Kulger
Mon-Tue	4/11-12/5	11pm - 7am	Margie Kotzalas

Japan Earthquake ERO Staffing Roster
 April 10-16, 2011
 Pay Period 9 - Week 1

Tue	12-Apr	7am - 3pm	Jim Isom
Tue	12-Apr	3pm-11pm	Andy Kulger
Tue-Wed	4/12-13/6	11pm - 7am	Margie Kotzalas
Wed	13-Apr	7am - 3pm	Jim Isom
Wed	13-Apr	3pm-11pm	Bill Roggenbrodt
Wed-Thur	4/13-4/14	11pm - 7am	Joelle Starefos
Thur	14-Apr	7am - 3pm	Jim Isom
Thur	14-Apr	3pm-11pm	Andy Kulger
Thur-Fri	4/14-4/15	11pm - 7am	Joelle Starefos
Fri	15-Apr	7am - 3pm	Jim Isom
Fri	15-Apr	3pm-11pm	Andy Kulger
Fri-Sat	4/15-4/16	11pm-7am	Joelle Starefos
RST Support (Seismology Q&A)			
Sat-Sun	4/9-4/10	11pm - 7am	(On Call)
Sun	10-Apr	7am - 3pm	(On Call)
Sun	10-Apr	3pm-11pm	(On Call)
Sun-Mon	4/10-4/11	11pm - 7am	(On Call)
Mon	11-Apr	7am - 3pm	(On Call)
Mon	11-Apr	3pm-11pm	(On Call)
Mon-Tue	4/11-12/5	11pm - 7am	(On Call)
Tue	12-Apr	7am - 3pm	(On Call)
Tue	12-Apr	3pm-11pm	(On Call)
Tue-Wed	4/12-13/6	11pm - 7am	(On Call)
Wed	13-Apr	7am - 3pm	(On Call)
Wed	13-Apr	3pm-11pm	(On Call)
Wed-Thur	4/13-4/14	11pm - 7am	(On Call)
Thur	14-Apr	7am - 3pm	(On Call)
Thur	14-Apr	3pm-11pm	(On Call)
Thur-Fri	4/14-4/15	11pm - 7am	(On Call)
Fri	15-Apr	7am - 3pm	(On Call)
Fri	15-Apr	3pm-11pm	(On Call)
Fri-Sat	4/15-4/16	11pm-7am	(On Call)
RST Support (Structural)			
Sat-Sun	4/9-4/10	11pm - 7am	(On Call) Pravin Patel
Sun	10-Apr	7am - 3pm	(On Call) Pravin Patel
Sun	10-Apr	3pm-11pm	(On Call) Pravin Patel
Sun-Mon	4/10-4/11	11pm - 7am	(On Call) Pravin Patel
Mon	11-Apr	7am - 3pm	(On Call) Pravin Patel
Mon	11-Apr	3pm-11pm	(On Call) Pravin Patel
Mon-Tues	4/11-12/5	11pm - 7am	(On Call) Pravin Patel
Tues	12-Apr	7am - 3pm	(On Call) Pravin Patel
Tues	12-Apr	3pm-11pm	(On Call) Pravin Patel
Tues-Wed	4/12-13/6	11pm - 7am	(On Call) Pravin Patel
Wed	13-Apr	7am - 3pm	(On Call) Pravin Patel

Japan Earthquake ERO Staffing Roster

April 10-16, 2011

Pay Period 9 - Week 1

Wed	13-Apr	3pm-11pm	(On Call) Pravin Patel
Wed-Thur	4/13-4/14	11pm - 7am	(On Call) Pravin Patel
Thur	14-Apr	7am - 3pm	(On Call) Pravin Patel
Thur	14-Apr	3pm-11pm	(On Call) Pravin Patel
Thur-Fri	4/14-4/15	11pm - 7am	(On Call) Pravin Patel
Fri	15-Apr	7am - 3pm	(On Call) Pravin Patel
Fri	15-Apr	3pm-11pm	(On Call) Pravin Patel
Fri-Sat	4/15-4/16	11pm-7am	(On Call) Pravin Patel