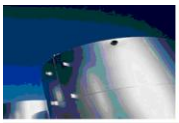


# Nordic Energy Newsletter

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Electricity Volume 225 March 15, 2011

Japan's nuclear crisis following last Thursday's earthquake and tsunami escalated ominously following a third and more dangerous hydrogen explosion early Tuesday local time that may have damaged part of the reactor's primary containment shell, and a fire at a fourth reactor building. The explosion at the Fukushima Daiichi unit 2 reactor followed a frantic battle by engineers to re-cover the reactor's fuel core with seawater, a critical action needed to halt a meltdown of the tops of fuel rods that could spin out of control if unchecked, experts said. Some reports said a crucial, doughnut-shaped "suppression chamber" or reservoir beneath the reactor that receives steam and gases from the reactor core had been damaged, increasing the risk of radiation release from that unit. Japan's Nuclear and Industrial Safety Agency (NISA) reported Tuesday that "the suppression chamber may be damaged," according to World Nuclear News, an industry information service.

Although the energy of the spent fuel rods is depleted, they are still "hot" and if left uncovered, could overheat, causing the casings to ignite and release radioactivity directly into the air. As of yesterday, Tokyo Electric Power (TEPCO) had still been unable to restore normal electric power at the reactor site. Friday's earthquake knocked down power lines and an hour later, the tsunami swept through the site, carrying away diesel fuel tanks for backup generators and damaging generator controls. Backup batteries eventually ran out, creating a "station blackout" condition. Then the station's pumping system was helpless to keep reactor fuel rods from a overheating. If unchecked, that could cause a core meltdown.

But steam and hydrogen gas have been vented out of the reactor and primary containment shell periodically to relieve potentially dangerous pressure. The steel reactor vessel contains the fuel rods. It is surrounded by a bell-shaped, steel-lined concrete primary containment shell. The third line of defense is the large secondary containment building. Hydrogen forms when overheated zirconium alloy casings of the fuel rods react with steam. The vented hydrogen gas collects at the top of the secondary containment building.

"They only had one option left, and that was seawater," said David Lochbaum, director of the nuclear safety program for the Union of Concerned Scientists. Some reports yesterday said water hoses pumping seawater to reactor unit 2 had been damaged by the explosion.

The seawater injections are the best option for stabilizing the reactors, but the crisis won't end until outside electric power is restored and the reactors' main pumping systems can be restarted to complete a cold shutdown of the reactor cores. He said he had not heard when that power restoration might occur.

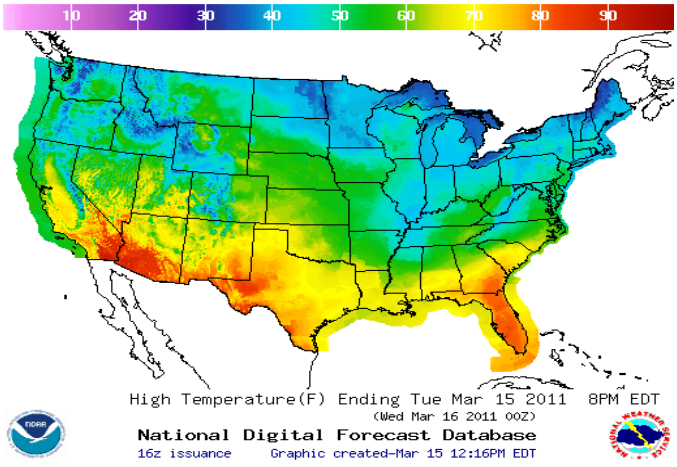
**Electricity Pricing Areas – On Peak - Month – Apr 2011**

| | | Mar 15, 2011 | Per kWh |
|---|---|---|---|
| Cinergy | | Hub Peak Swap Monthly | $.03596 |
| PJM Hub | | Electricity Monthly | $.04541 |
| PJM | | No. Illinois Peak LMP | $.03538 |
| PJM | | Western Peak LMP | $.04541 |

**ComEd Average Day Ahead LMP Electric Price**

| Time Period | Average per Kwh |
|---|---|
| Apr 1 – Apr 30 | $.02911 |
| May 1- May 31 | $.03389 |
| Jun 1- Jun 30 | $.04184 |
| Jul 1 - Jul 31 | $.04741 |
| Aug 1 –Aug 31 | $.04628 |
| Sep 1 - Sep 30 | $.02934 |
| Oct 1 - Oct 31 | $.02702 |
| Nov 1 - Nov 30 | $.02778 |
| Dec 1 – Dec 31 | $.03545 |
| Jan 1 –Jan 31, 2011 | $.03871 |
| Feb 1 – Feb 28 | $.03581 |
| March 1 thru Mar 14 | $.03593 |

**Weather - Tue:** Cloudy with a few showers. High near 45F. Winds NE at 10 to 15 mph. Chance of rain 30%. **Wed:** Sunny skies. High 56F. Winds WSW at 10 to 15 mph. **Thu:** Windy with a possible thunderstorm. Highs in the low 60s and lows in the low 50s. **Fri:** Showers, maybe a rumble of thunder. Highs in the mid 50s and lows in the low 40s. **Sat:** A few clouds. Highs in the low 50s and lows in the mid 40s.




**Extended Temperature Forecast**: Chicago Area

| Tue | Wed | Thu | Fri | Sat |
|---|---|---|---|---|
| 36 - 45 | 46 - 56 | 52- 62 | 40 - 55 | 43 - 52 |