The Oil Drum
DISCUSSIONS ABOUT ENERGY AND OUR FUTURE

Fukushima Open Thread Wed - 4/6

Posted by JoulesBurn on April 6, 2011 - 11:19am

The theme for the day is unintended consequences, or perhaps the lesser of evils. A fix of sorts is applied for an acute problem, but the fix creates new problems. After trying for several days, Tepco finally stopped the gushing of radioactive water into the sea. Sort of.

> On Tuesday, the plant operator drilled a hole into a layer of gravel around the pit, and poured a hardening agent called liquid glass, or sodium silicate, to stop the leak of highly radioactive water into the sea.
>
> *Meanwhile*, TEPCO is continuing to release about 8,000 tons of wastewater contaminated with low-level radiation into the sea to make room in storage tanks for highly contaminated water. It says about 6,000 tons of water have already been released.

Thread closed. Discussion moved to http://www.theoildrum.com/node/7776

Of course, the water is still being injected into the reactors or poured into the buildings...

> But about 500 tons of fresh water is injected into reactor buildings each day to cool down the reactors. Some of the water is believed to be leaking outside after becoming contaminated.

As we remember, seawater was initially being used in an attempt to cool the reactor cores and spent fuel, and this went on for several days before is was suggested that continuing was a bad idea due to buildup of salt.

> Defense Minister Yoshimi Kitazawa said late Friday that the U.S. government had made "an extremely urgent" request to switch to freshwater. He said the U.S. military was sending water to nearby Onahama Bay and that water injections could begin early next week.

Yesterday, the NY Times obtained a copy of a confidential memo, prepared by the US Nuclear Regulatory Commission, which also refers to unintended consequences.

> United States government engineers sent to help with the crisis in Japan are warning that the troubled nuclear plant there is facing a wide array of fresh threats that could persist indefinitely, and that in some cases are expected to increase as a result of the very measures being taken to keep the plant stable...

One potential problem mentioned, seemingly enough, is buildup of water in containment structures, causing stress problems which could make them more vulnerable to aftershocks. Another hazard identified in the assessment is the familiar problem of hydrogen buildup, which could lead to additional explosions. And while it is not clear that Tepco was responding directly to this suggestion, they have decided to inject nitrogen into the buildings to flush out the hydrogen.

Japan Nuclear Plant Operator Prepares to Inject Nitrogen

> The same approach might later be tried for the No. 2 and No. 3 reactors, but the No. 1 unit was chosen first because the pressures and temperatures in that reactor are higher than in the other two.

The prospect of imminent danger has been denied, however.

> The nitrogen, an inert gas, is expected to be injected into the No. 1 reactor's containment vessel, a process that could take several days. Hidehiko Nishiyama, a spokesman for the government's nuclear agency, denied during a morning press conference that there is an "immediate danger" of explosion.

Continued hydrogen production could imply that there has been oxidation of the zirconium cladding surrounding the fuel pellets, which in turn implies very high temperatures. Why isn't this thing cooling off? Possibilities:

- Poor heat transfer, perhaps getting worse with time
- Re-criticality, facilitated by damage to the core structure and insufficient borate in the water

Elsewhere, reactors 5 and 6 are being inundated with radioactive groundwater.

And then there are the spent fuel pools. As for good news, we have no confirmation that TCHLTV:

> *But we don't believe at this point in time that that core has left the vessel.*
>
> Martin Virgilio
> Nuclear Regulatory Commission
> 4/6/2011

New: View the NRC document mentioned in the NYT here. (A Google Doc, upside down. On left menu, download original as pdf, and then invert -- or not)

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