

- [About us](#)
- [Advertise](#)
- [Contact Us](#)
- [Send Comments/Tips](#)

- [My FDL](#)
- [Firedoglake](#)
- [News](#)
- [Emptywheel](#)
- [TBogg](#)
- [ATTACKERMAN](#)
- [La Figa](#)
- [Book Salon](#)
- [FDL Action](#)
- [Work](#)
- [Elections](#)
- [FDL TV](#)
- [Just Say Now](#)

[« While Libyan Freedom fighters chant ‘Where is Obama’, Pres sends Marines to capture Bradley Manning’s clothes](#)



Nuke engineer: Fuel rod fire at Fukushima reactor “would be like Chernobyl on steroids”

By: [Kirk James Murphy, M.D.](#) Monday
March 14, 2011 12:14 am



The Fukushima reactor building that [exploded March 12](#) is one of a series of identical General Electric reactors constructed in Japan and the US. In this reactor design, the used nuclear fuel rods are stored in pools of water at the top of the reactor building. These “spent” rods are still highly radioactive: the radioactivity is so great the rods must be stored in water so they do not combust. The explosion at Fukushima Daiichi reactor unit 1 apparently destroyed at least one wall and the roof of the building: some reports stated the roof had collapsed into the building.

Two days later, the nearby building containing the plutonium-uranium (MOX) fueled Fukushima Daiichi [reactor unit 3 exploded](#). So why bother about the rubble of reactor No 1? The WaPo quotes a [nuclear engineer](#) who knows the answer:

Although Tokyo Electric said it also continued to deal with cooling system failures and high pressures at half a dozen of its 10 reactors in the two Fukushima

complexes, fears mounted about the threat posed by the pools of water where years of spent fuel rods are stored.

At the 40-year-old Fukushima Daiichi unit 1, where an explosion Saturday destroyed a building housing the reactor, the spent fuel pool, in accordance with General Electric's design, is placed above the reactor. Tokyo Electric said it was trying to figure out how to maintain water levels in the pools, indicating that the normal safety systems there had failed, too. Failure to keep adequate water levels in a pool would lead to a catastrophic fire, said nuclear experts, some of whom think that unit 1's pool may now be outside.

"That would be like Chernobyl on steroids," said Arnie Gundersen, a nuclear engineer at Fairewinds Associates and a member of the public oversight panel for the Vermont Yankee nuclear plant, which is identical to the Fukushima Daiichi unit 1.

People familiar with the plant said there are seven spent fuel pools at Fukushima Daiichi, many of them densely packed.

Gundersen said the unit 1 pool could have as much as 20 years of spent fuel rods, which are still radioactive.

We'd be lucky if we only had to worry about the spent fuel rods from a single holding pool. We're not that lucky. The Fukushima Daiichi plant has [seven pools](#) for spent fuel rods. Six of these are (or were) located at the top of six reactor buildings. One "common pool" is at ground level in a separate building. Each "reactor top" pool holds 3450 fuel rod assemblies. The common pool holds 6291 fuel rod assemblies. [The common pool has windows on one wall which were almost certainly destroyed by the tsunami.] Each assembly holds [sixty-three](#) fuel rods. This means the Fukushima Daiichi plant may contain over 600,000 spent fuel rods.

The fuel rods must be kept submerged in water. Why? Outside of the water bath, the radioactivity in the used rods can cause them to become so hot they begin to catch fire. These fires can burn so hot the radioactive rod contents are carried into the atmosphere as vaporized material or as very small particles. Reactor no 3 burns MOX fuel that contains a mix of plutonium and uranium. Plutonium generates more heat than uranium, which means these rods have the greatest risk of burning. That's bad news, because plutonium scattered into the atmosphere is even more dangerous than the combustion products of rods without plutonium.

Chernobyl on steroids. When the nuclear engineer from an identical plant states there's any possibility of such a catastrophe, Washington, we have a problem. Chernobyl's contamination settled upon people and nations thousands of miles from that reactor's location. How far would "Chernobyl on steroids" travel? And where are the up to 20 years of reactor no 1 spent fuel rods that could cause such a problem, and the spent fuel rods held – until the building exploded – in the spent fuel rod pool atop reactor no 3?

Along with the rest of the planet, Washington's looking at the risk of a potential catastrophe. At least when it comes to finding the fuel rods from reactor 1, Washington possesses some unique assets. One asset – the secretive [National Reconnaissance Office](#) – runs the [spy satellites](#) remote sensing devices that enable US national security to spy on planet Earth. The NRO's slightly less secretive cousin over at the the Pentagon is the [Defense Intelligence Agency](#). The DIA, in turn, controls MASINT "measures and signatures technologies".

What is MASINT? FDL's recent guest Tim Shorrock answered that question a few years ago for CorpWatch:

[MASINT](#) is a highly classified form of intelligence that uses infrared sensors and other technologies to "sniff" the atmosphere for certain chemicals and electromagnetic activity and "see" beneath bridges and forest canopies. Using its tools, analysts can detect signs that a nuclear power plant is producing plutonium, determine from truck exhaust what types of vehicles are in a convoy, and detect people and weapons hidden from the view of satellites or photoreconnaissance aircraft.

With assets like the NRO and the DIA's MASINT capacity, even an Obama administration that couldn't find out millions of barrels of Corexit and crude oil would poison the Gulf should be able to help Japan's Fukushima plant locate their missing fuel rods. And do so before the missing rods – or any of the other pools of fuel rods in Japan's stricken reactors – ignite Chernobyl on steroids.

Once Obama and his generals have found the fuel rods, let's hope they'll time out from Gridion dinners and collateral damage and let the Americans who pay for all the fancy spy technology know what's happening. Because now that Americans are hearing CNN's Dr. Gupta talking about potassium iodide (KI) to prevent radiation toxicity, they're going to be wondering if they need to take KI. As long as we don't see massive uncontrolled radiation releases from the stricken reactors, they probably won't. Should we see Chernobyl on steroids, Americans may need a whole lot more than KI. And until the spent fuel rods are located, there won't be enough information to let Americans plan how to protect their loved ones. Unless we all learn the fuel rods have caught fire.

[Note: revised at 3:15 PM Pacific on 3/14/11]

 [120 Comments](#) [Recommend](#)

Tags: [MOX](#), [MASINT](#), [Japan](#), [NRO](#), [plutonium](#), [Vermont Yankee](#), [potassium iodide](#), [General Electric reactors](#), [GE reactors](#), [Daichi](#), [Chernobyl on steroids](#), [Arnie Gundesen](#), [DIA](#), [FEMA](#), [Fukushima](#), [fuel rods](#), ["Clean. Safe. Too cheap to meter."](#)

**Using your debit card is about
to get more expensive.**



TELL CONGRESS NO!

120 Responses to Nuke engineer: Fuel rod fire at Fukushima reactor “would be like Chernobyl on steroids”

1. [Kirk James Murphy, M.D.](#) March 14th, 2011 at 12:59 am [«](#)

Reactor unit no 3 uses MOX fuel: that’s a mix of uranium and plutonium. Fuel rods with plutonium get hotter, faster. And finding the spent fuel fods with plutonium just got a whole lot harder: [Forbes](#) states the second blast at reactor unit 3 “ripped the top off”.

Kudos to GE for their great design – and for inflicting it upon Japan and America.

[Log in to Reply](#)

- [pdaly](#) March 14th, 2011 at 7:14 am [«](#)

Kirk, could you review the time for these radioactive isotopes to decay should they contaminate the environment?

[Log in to Reply](#)

- [MtnWoman](#) March 14th, 2011 at 12:39 pm [«](#)

MOX fuel is another of my concerns because as you said those rods contain plutonium. The GE design didn’t require this fuel – the utility switched Unit 3 to this fuel in September 2010. France is a big user and reprocessor developing this fuel and that’s where Japan obtained it.

This is interesting:

Plutonium threat at Japan reactor, expert warns
http://news.cnet.com/8301-11386_3-20042852-76.html

As an M.D. you may be interested in this PDF:

<http://www.nci.org/PDF/lyman-mox-sgs.pdf>

Public Health Risks of Substituting Mixed-Oxide For Uranium Fuel in Pressurized-Water Reactors

“This paper finds that compared to LEU (low enriched uranium) cores, the number of latent cancer fatalities (LCFs) resulting from an accident with core melt and early containment failure would be higher by 39%, 81% or 131% for full WG-MOX cores, depending on the fraction of actinides released (0.3%, 1.5% or 6%).”

(WG is weapons grade)

I’m not sure it makes a difference in the health risks if MOX is fueling a PWR vs a BWR.

[Log in to Reply](#)

- [dagoril](#) March 14th, 2011 at 1:08 pm [«](#)

GE...we bring good things to life!

Would be funny if it weren't so tragic.

[Log in to Reply](#)

- [rapier51](#) March 14th, 2011 at 1:36 pm [«](#)

That fuel is probably only in the reactor. Admittedly this is a wild assed guess but that fuel I recall was newly introduced. Some of them may be spent and in the pool and some new ones as well, queued for the next refilling.

The spent rods burning is a concern but so is them being tossed all about or falling down into the plant. If that's the case then it will be very very hot radiation wise in there making work there extremely problematic.

Admittedly this is an alarmist idea but it could be so contaminated in there that workers could conceivably be on suicide missions. I am not saying they are I am saying it is within the realm of possibility. And lets not forget the explosions.

The worst job in the world is now at this site.

[Log in to Reply](#)

2. [BeachPopulist](#) March 14th, 2011 at 1:09 am [«](#)

I live near the beach in L.A. Guess which way those winds blow?

Oh, lucky me. Guess I'll be taking an extended vacation with relatives in the east. (How does the rest of my life sound? Good. Okay.)

[Log in to Reply](#)

3. [Crane-Station](#) March 14th, 2011 at 4:36 am [«](#)

Missing rods? When my husband and I were discussing this last night we decided to go ahead and hope they were contained within a vessel. Guess this was wishful thinking. And again, like I am five: what is a fuel rod and are you saying they were in the top of the building? And, a third explosion? Lord God.

[Log in to Reply](#)

- [MtnWoman](#) March 14th, 2011 at 12:09 pm [«](#)

It is the fuel assemblies that are removed and replaced during refueling outages that are submerged in these pools. Assemblies that are actually used in producing electricity are in a reactor vessel in a containment building.

Fuel rods are combined into fuel assemblies (also may be called bundles). There are some differences in these between a PWR (pressurized water reactor like at TMI) and a BWR (boiling water reactor like those in trouble in Japan).

For example for a PWR the assembly is comprised of 264 fuel rods and a BWR assembly is comprised of 63 fuel rods.

check this link for a schematic of a PWR assembly:

<http://www.mnf.co.jp/pages2/pwr2.htm>

Click here for a brief description of the manufacture
http://www.eoearth.org/article/Nuclear_fuel_fabrication

Big issue with Unit 3 is that is fueled with MOX – a fuel comprised of plutonium and uranium. Other reactors are fueled with enriched uranium.

Hope this helps.

[Log in to Reply](#)

- [BooRadley](#) March 14th, 2011 at 12:33 pm <<

Much appreciated.

[Log in to Reply](#)

4. [vector56](#) March 14th, 2011 at 5:24 am <<

Hiroshima and Nagasaki, two of the greatest acts of terrorism in human history.

Radiation could, might be blown across the ocean and somehow harm us.

Yes, the awkward dance the corporate media is engaged in: how does one talk about radiation and Japan while evading the fact that we dropped not one but two Atomic bombs on these people!

I know, “it was war”; any and all acts of terrorism committed while wearing official state uniforms do not count. But this act of being the first and only country in human history to unleash the destructive power of a mini sun on men women and children Puts us apart from all others. So, when you cold technocrats talk of ration possibly being blown across the ocean to harm us remember that cold hearted bitch Enola Gay.

Paul Tibbets named the plane after his dear mother: to his dieing day (a few years back) Tibbets had “no” regrets!

[Log in to Reply](#)

- [Kassandra](#) March 14th, 2011 at 7:30 am <<

The “cold hearted bitch” was the pilot who said he never missed a night’s sleep because of it.

Orders, you know

[Log in to Reply](#)

- [TomThePatriot](#) March 14th, 2011 at 2:40 pm <<

The second greatest act of terrorism is Obama and the corporate-welfare nuclear industry around the world brainwashing the world into loving nukes again.

Obviously Hiroshima and Nagasaki, Three Mile Island, Chernobyl... never heard of them? What were they? Oh, they happened a long time ago, nobody cares today. And all the paid industry experts and the paid-off politicians say we need them. And nuclear is “clean energy”!

How clean is it really today? The Japanese and the US military are conspiring to make sure we will never know what is really going on there right now.

And si, if it so clean and wonderful, then all the energy company CEOs, the fat-cat Wall Street investors, and Obama's family will be happy to live full-time on the ground of completely safe these nuclear plants. Only then will I even consider anything these paid liars and industry shills like Obama.

Green Party! Don't waste your vote on these people trying to kill you and destroy your family.

[Log in to Reply](#)

- [TalkingStick](#) March 14th, 2011 at 3:03 pm [«](#)

Could it be, the arc of justice is taking its turn East?

[Log in to Reply](#)

- [dark knight](#) March 14th, 2011 at 3:45 pm [«](#)

And don't forget the firebombing of Tokyo on 3-9-1945 that killed over 100,000 people.

[Log in to Reply](#)

5. [markfromireland](#) March 14th, 2011 at 6:08 am [«](#)

Small niggle:

from an identical palnt

should be

from an identical plant

markfromireland

[Log in to Reply](#)

- [Kirk James Murphy, M.D.](#) March 14th, 2011 at 6:11 am [«](#)

Thanks!

[Log in to Reply](#)

6. [Kassandra](#) March 14th, 2011 at 7:28 am [«](#)

Perfect!

Nuclear Catastrophe? Take a PILL!!!!

[Log in to Reply](#)

- [edve](#) March 14th, 2011 at 11:15 am [«](#)

Remember this tidy little fact folks...

The thyroid gland is vulnerable to the uptake of radioactive iodine. If a radiological release occurs at a nuclear power plant, STATES MAY DECIDE to provide the public with a stable iodine, potassium iodide, which saturates the thyroïd and protects it from the uptake of radioactive iodine. Such a protective action is at the OPTION OF THE STATE, and in some cases, local government.

[Log in to Reply](#)

- [MtnWoman](#) March 14th, 2011 at 12:48 pm <<

I worked at TMI for 12 years (not as a technical person) and when we had drills (we were simulating an actual event) there was always an announcement prohibiting eating, drinking, and smoking to reduce potential of ingesting some bad stuff.

[Log in to Reply](#)

7. [ThingsComeUndone](#) March 14th, 2011 at 8:07 am <<

where an explosion Saturday destroyed a building housing the reactor, the spent fuel pool, in accordance with General Electric's design, is placed above the reactor. Tokyo Electric said it was trying to figure out how to maintain water levels in the pools,

If the room housing the fuel rod pool exploded then unless the fuel rod pool has a lid of some sort water and fuel rods were likely already pushed out of the pool. With no cooling system working all we can hope for is that the Japanese can spray enough sea water to keep the pool cool long enough for the rods to cool down. Otherwise America is going to get an immigration problem the size of which it has never seen before.

[Log in to Reply](#)

- [MtnWoman](#) March 14th, 2011 at 1:29 pm <<

Here's a fact sheet on Fukushima Nuclear Power Plant from the Nuclear Information and Research Service. They're keeping it up-to-date with events and and it has links to information.

<http://www.scribd.com/doc/50691353/NIRS-Fukushima-fact-sheet-centrale-nucleaire#fullscreen:on>

- [ADC14](#) March 14th, 2011 at 2:11 pm <<

Too bad radiation can't be dispatched with sea water as easily as Triffids.

[Log in to Reply](#)

8. [ThingsComeUndone](#) March 14th, 2011 at 8:20 am <<

KI. ???

Also finding the rods is not a problem they are radioactive moving tons? of radioactive rods that have to be kept in water at all times that are housed on the top of a reactor building where I'm sure the freight elevator isn't working is a problem.

Maybe the army can send in a helicopter and troops in lead suits can get lowered onto the top of the reactor building they can scoop up the rods by hand place each scoop in a bucket of water that hopefully doesn't boil away instantly then the helicopter can hoist up the buckets and transport them.

But wait the Japanese are still spraying the pool with sea water I assume from firehouses workers in lead suits might get knocked over.

Maybe any rods scattered by the blasts can be found if they have not burned up in the air already.

[Log in to Reply](#)

- [gigi3](#) March 14th, 2011 at 3:59 pm [«](#)

KI is potassium iodate. It is used to prevent too much saturation of radioactive iodine in your thyroid gland.

[Log in to Reply](#)

- [gigi3](#) March 14th, 2011 at 5:25 pm [«](#)

Correction: KI is potassium iodide.

Potassium iodate is KI03

[Log in to Reply](#)

9. [SteveInNC](#) March 14th, 2011 at 8:26 am [«](#)

Speaking as an engineer, though not a nuclear one, I was pretty much stunned upon reading that the fuel rods were stored on an upper level. First of all, that very large tank of water is going to be massively heavy, even before it's loaded up with dense fuel rods. The structure required to support that tank is going to be similarly massive, and vulnerable to corrosion from any leaks from the aforementioned ginormous tank of water. A top-heavy structure is going to be more vulnerable to shaking in an earthquake, and even if it does not collapse, cracking of the tank and subsequent leakage of coolant is a very possible failure mode. Refilling a leaky tank on an upper level is also problematic.

I wonder if the GE design uses the reactor containment vessel itself as the supporting structure for the spent fuel cooling pond? It would certainly be strong enough, and would appear as an accounting savings to the builder, since they would not have to build a separate supporting structure. Of course the economic costs of the subsequent catastrophe are typically borne by governments (taxpayers) and the unlucky folks that are in the wrong place at the wrong time. So win-win for the bean-counters. /s

This is one of the reasons why I believe that the current nuclear power technology (PWR and BWR) is inherently unsafe. Then, even if you solve the vulnerability to coolant loss, there is still the question of waste that remains dangerous for up to 100,000 years.

[Log in to Reply](#)

- [ThingsComeUndone](#) March 14th, 2011 at 9:48 am [«](#)

The tower the tank rests on is steel and or reinforced concrete? I ask because sea water rusts steel and softens concrete.

Also by placing the tank on top of the reactor well if the tank is leaking everything below the tank like the reactor itself gets radioactive Double Stupid Points!

Given that the tanks are being sprayed with salt water we are spreading the radiation and further weakening the supports that hold the tank as you noted way up high given the continuing after shocks from the earthquake well Things Just Keep getting Worse.

[Log in to Reply](#)

10. [ThingsComeUndone](#) March 14th, 2011 at 8:27 am [«](#)

Chernobyl I seem to recall made the EU dump milk because radioactive dust landed on the grass the cows eat. So aside from the obvious sea food problems we could expect California's milk, rice, fruit, veggies etc could all get hit?
Food Prices go up inflation gets out of control if Arabs were rioting over higher food prices before well things might get much worse.

[Log in to Reply](#)

11. [Masoninblue](#) March 14th, 2011 at 9:59 am [«](#)

From photographs of the remains of the cement containment building at Fukushima Daiichi #1 after the explosion, the roof and the top third of the outer walls were missing. That indicates that the spent fuel rods and the pool that contained them were blown up in the explosion.

Twenty years or more of expended fuel rods equals how many fuel rods?

What is the likely consequence to the fuel rods, given the nature and force of the explosion? Did they vaporize? Are they in identifiable and locatable pieces, and if so, where?

How much radiation are they emitting?

Is anyone looking for them, and if not, why not?

[Log in to Reply](#)

- [ThingsComeUndone](#) March 14th, 2011 at 12:00 pm [«](#)

If the rods are blown up then Kirk's theory about finding them even with all our tech just got harder we will need a gieger counter tweezers a shop vac and tons of guys in lead suits walking for miles for months.

[Log in to Reply](#)

12. [Kirk James Murphy, M.D.](#) March 14th, 2011 at 10:45 am [«](#)

A contributor to the Occupational and Environmental Medicine list who once worked on nuclear waste issues has provided additional information about Fukushima's spent fuel rod assemblies.

"NIRS has a Nov 2010 powerpoint from Tokyo Electric Power Company (in english) detailing the modes and quantities of spent fuel stored at the Fukushima Daiichi plant where containment buildings #1 and #3 have exploded.

http://www.nirs.org/reactorwatch/accidents/6-1_powerpoint.pdf

If you have not yet seen the #3 explosion, I urge you to watch a short video that shows this from the start, at <http://bit.ly/i6BifL>

After the smoke clears, it is evident that much more of the containment building around reactor #3 blew away than #1. There is no way the spent fuel storage pool, which sits just below the roof in the GE Mark 1 design, could have survived this blast intact.

And unlike unit #1 which was using uranium fuel, #3 uses MOX fuel that contains a mix of uranium and plutonium oxide.

The number of fuel assemblies in the reactor's spent fuel pool, dry cask storage, and a common pool shared by all four reactors is shown on slide #9.

According to TEPCO, each reactor at Daiichi generates 700 "waste" fuel assemblies year, and there are 3450 assemblies in each reactor's pool, plus another 6291 in a common pool in a separate building.

As shown in slide 10, the common pool building sits at ground level, with the pool itself above ground. The building also has windows on at least one side, and these were undoubtedly broken out by the tsunami which would have then flooded the entire building."

[Log in to Reply](#)

- [Masoninblue](#) March 14th, 2011 at 11:15 am [«](#)

I'm having trouble visualizing how to combine the reactor drawing that is attached to each of the blogs here at FDL and the slide that shows the storage pool, Put another way, where is the pool in the reactor drawing and where is the reactor in the pool slide?

Have you checked out the before and after photos of the Fukushima Daiichi reactor #1 containment building that are displayed at bradblog?

Looks to me like the entire roof and upper third of the outside walls of the building were blown away, which I assume means that the pool and all of the spent rods blew up in the explosion.

Agree or disagree?

[Log in to Reply](#)

- [Kirk James Murphy, M.D.](#) March 14th, 2011 at 11:38 am [«](#)

I confess I am spatially challenged when looking at diagrams. If I understand the text correctly, Fukushima has two sets of spent fuel rod storage pools.

Set # 1: Each reactor building has a pool near the roof that holds 3450 assemblies: these are the ones that were likely destroyed by the reactor building explosions at unit 1 and 3.

Set # 2: One member of this set: the ground level common pool in a separate building (the one shown in slide 10, if I'm understanding) with the 6291 assemblies.

Hope this helps!

[Log in to Reply](#)

13. [MtnWoman](#) March 14th, 2011 at 11:43 am «

These spent fuel pools are more vulnerable to disaster than the core – the containment may well remain intact but those fuel pools are more vulnerable. It's hard to imagine they haven't been compromised in these explosions.

Robert Alvarez has a blog at the Institute for Policy Studies – he's a Senior Scholar and former DOE official:

http://www.ips-dc.org/blog/meltdowns_grow_more_likely_at_the_fukushima_reactors

Along with the struggle to cool the reactors is the potential danger from an inability to cool Fukushima's spent nuclear fuel pools. They contain very large concentrations of radioactivity, can catch fire, and are in much more vulnerable buildings. The ponds, typically rectangular basins about 40 feet deep, are made of reinforced concrete walls four to five feet thick lined with stainless steel.

The boiling-water reactors at Fukushima — 40 years old and designed by General Electric — have spent fuel pools several stories above ground adjacent to the top of the reactor. The hydrogen explosion may have blown off the roof covering the pool, as it's not under containment. The pool requires water circulation to remove decay heat. If this doesn't happen, the water will evaporate and possibly boil off. If a pool wall or support is compromised, then drainage is a concern. Once the water drops to around 5-6 feet above the assemblies, dose rates could be life-threatening near the reactor building. If significant drainage occurs, after several hours the zirconium cladding around the irradiated uranium could ignite.

Then all bets are off.

On average, spent fuel ponds hold five-to-ten times more long-lived radioactivity than a reactor core. Particularly worrisome is the large amount of cesium-137 in fuel ponds, which contain anywhere from 20 to 50 million curies of this dangerous radioactive isotope. With a half-life of 30 years, cesium-137 gives off highly penetrating radiation and is absorbed in the food chain as if it were potassium.

This is an interview of David Lochbaum, nuclear safety engineer of the Union of Concerned Scientists and a consultant to both industry and the Nuclear Regulatory Commission by Roger Witherspoon – this was after the Unit 1 explosion:

<http://spoonsenergymatters.wordpress.com/2011/03/12/a-nuclear-hail-mary-seawater-or-disaster/>

The acid could also be used to help prevent a far more serious melt down in the spent fuel pool. The explosion, said Lochbaum, as dramatic as it was, was not likely to have been strong enough to destroy the walls of the spent fuel pools, which usually consist of about five feet of reinforced concrete. These reactors have 6 spent fuel pools above the reactors.

But water containing boric acid has to continually circulate in the pool to keep the bundles cool. When the power was lost at the site, the cooling system for the pools stopped. And the batteries used to try and restore cooling to the reactor vessel itself are not strong

enough to also operate cooling systems for pool. On average, the water in these pools would heat up and evaporate to the point where the tops of the fuel bundles were exposed about 24 hours after the cooling system shut down.

In addition, if the explosion knocked debris from the roof into the pool, it could interfere with natural convection cooling of some of the fuel bundles, or even break some of them, sending the irradiated fuel chunks to the bottom of the pool where they could reach critical mass. Boric acid could be added to the pools to help prevent that development.

Witherspoon's followup:

<http://spoonsenergymatters.wordpress.com/2011/03/13/japans-information-deficit/>

And then, there is the unspoken issue: the spent fuel pool. The most extensive assessment of the damage to be wrought by an exothermic fire in a spent fuel pool was developed by the Nuclear Regulatory Commission in October, 2000, and removed from public view following the September 11, 2001 terrorist attacks. The report is available here: <http://bit.ly/...>

According to Paul Gunter of the non-profit Beyond Nuclear, information is crucial at this time — but it is just not available. The reactors at Fukushima have six separate spent fuel pools, each located above the reactors. If the reactors are overheating, is the spent fuel above them being slowly grilled?

The situation, particularly in light of the second explosion at Fukushima Daiichi Unit 3, raises these questions:

1. Why hasn't the government mentioned the disposition of the stored fuel in these pools?
2. Has the water level dropped to the point where these fuel rods are exposed.
3. Have any of them begun burning?
4. What steps, if any, can they take to prevent an exothermic fire in the spent fuel pools.

The link is to a PDF titled Technical Study of Spent Fuel Accident Risk at Decommissioning Nuclear Plants

[Log in to Reply](#)

- [Kirk James Murphy, M.D.](#) March 14th, 2011 at 11:51 am [«](#)

MtnWoman, thanks for your thorough observations – you learned me. Is it possible to repost the link for the NRC report? The bit link doesn't lead to any reports.

Also, would you consider writing up these observations as a stand alone diary at MyFDL? The information you've shared deserves to be seen as widely as possible.

- [Log in to Reply](#)
◦ [garbanzo](#) March 14th, 2011 at 1:23 pm [«](#)

So if the tops of the rods would be exposed from vaporization after 24h, why haven't we seen a significant radiation release? It's been 72h since the pumps stopped...

[Log in to Reply](#)

■ [garbanzo](#) March 14th, 2011 at 1:31 pm <<

And again, you can find the radiation measurements here:

<http://translate.google.com/translate?hl=en&sl=ja&tl=en&u=http%3A%2F%2Fwww.tepco.co.jp%2Ftepcnews%2Findex-j.html>

If they've got exposed rods the radiation release would be a hell of a lot higher than 200 uSv, it would be at least dozens of rems per hour, hundreds of thousands of uSv/hr.

[Log in to Reply](#)

14. [MtnWoman](#) March 14th, 2011 at 12:21 pm <<

Try this link:

<http://www.rogerwitherspoon.com/docs/nrctechstudyosfprisks-10-2000.pdf>

I was just posting excerpts from the information I found but I didn't know how to do blockquotes. I thought it would be obvious if I posted the links before the info but maybe not.

I believe this has been a part of the story the media has missed for days. I don't know if they didn't realize or spent fuel was stored onsite and also posed a dire threat or they didn't know enough to ask about it.

I sent a story suggestion to an MSNBC investigative reporter and he said he'd take a look.

Glad this information was helpful.

[Log in to Reply](#)

◦ [Kirk James Murphy, M.D.](#) March 14th, 2011 at 12:27 pm <<

Thanks!

On my browser at the moment the blockquotes function doesn't even show up :(

I very much appreciate your efforts and your information.

(If you'd like to take a try at writing, MyFDL will let you post diaries for no cost – the information you shared with us today will lend itself nicely to that. Once again, thank you.)

[Log in to Reply](#)

15. [Masoninblue](#) March 14th, 2011 at 12:43 pm <<

Here's a BBC video of the explosion at the Fukushima Daiichi #3 nuclear reactor. I see large clumps of debris from the explosion falling almost straight down and landing next to the remains of the building and I'm wondering if they are clumps of the steel lined thick concrete wall of the pool that contains the the spent rods?

When they say the pool is above and adjacent to the reactor core, does that mean it's within or outside of the blast zone?

Any ideas?

<http://www.bbc.co.uk/news/world-asia-pacific-12729221>

[Log in to Reply](#)

16. [Eufordum](#) March 14th, 2011 at 12:52 pm [«](#)

Please keep in mind when reading comments from the “experts” quoted above is that almost every one of them have been anti-nuke for years and are far from unbiased. For instance, Arnie Gundersen does not work for Vermont Yankee: he works for himself as an “expert” on the problems with nuclear power and gets paid handsomely for doing so. He had a very typical and mundane career in nuclear power and passes himself off as an expert. I have also had a typical and mundane nuclear career and would not claim to be an expert, but perhaps can shed some light.

None of the spent fuel rods are lost. I think people are confused by the statement that they are now “outside”. What blew off the reactor building was the metal panel structure on top of the concrete containment. What was once the refueling area floor is now the roof of the building. The spent fuel pool is like a deep swimming pool with its edge level to the floor (now roof) with about ten feet of water above the fuel rod assemblies. I doubt that water was blown out of the pools or that they were seriously damaged. The energy in these hydrogen/steam explosions was directed up and out. Also, water is extremely difficult to displace from an explosion occurring from above. The 24 hour boil off period also sounds suspect. I believe it is more in the range of a week.

No question though that they need to keep water in the pool and that this situation will be very problematic if cooling isn’t maintained. The good part is that they just need to keep the pool filled for the time being and since it is an open pool they do not need to pump against system pressure. The downside is that they need to get the water to an upper elevation and may not have an intact piping system to do so. They could even use something as basic as a fire truck pumper and hoses as long as they could still access the refueling floor.

Take this quiz get more information. <http://www.microsimtech.com/sfpquiz/default.htm>

[Log in to Reply](#)

◦ [garbanzo](#) March 14th, 2011 at 1:28 pm [«](#)

Thanks. People are getting riled up unnecessarily by our media. No, the situation’s not great, but it’s not going to be “Chernobyl on steroids” unless some pretty improbable events occur.

[Log in to Reply](#)

■ [Watt4Bob](#) March 14th, 2011 at 2:02 pm [«](#)

I’d say the exact opposite is true, that people are getting riled up because they understand that the government and the media are second-rate providers of reliable information.

Eufordum has provided valuable information of a type that has not been coming from government or media.

However people are right to be riled up, people with some common-sense protested the building of nuclear power plants near fault lines prior to their construction and TPTB replied that they were perfectly

safe "*unless some pretty improbable events occur.*" well, a lot of improbable events have occurred and here we are.

If our rulers, (notice I don't say leaders) were more honest and forthcoming, we wouldn't be spending so much time speculating about the truth of situation in Japan as reported.

I'd also point out that it's no coincidence that we should be experiencing a lack of proper coverage of these disasters at this point considering we've been seeing an accelerating interest in building more nuclear power plants in this and other countries around the world.

[Log in to Reply](#)

- [garbanzo](#) March 14th, 2011 at 2:07 pm <<

We are experiencing a lack of proper coverage. How many people know that the "explosion" was the facade of the building blowing off? How many people know that the radiation figures are published on the net for all to see?

So far there has been virtually no release of radiation (a couple clouds with ~250uSv intensity, which is nothing), and TEPCO has gone ahead and pumped seawater into all these reactors, offlining them forever. I can't say I'd be confident either of those would be the case in the US, I remember BP's lowballing all too well and I bet we'd try to save the things until they went Chernobyl.

The numbers don't lie, so far this has been well contained and hopefully it will continue to be.

[Log in to Reply](#)

- [garbanzo](#) March 14th, 2011 at 2:45 pm <<

I didn't realize the hydrogen explosions further damaged the pumps. That actually is pretty bad.

- [gigi3](#) March 14th, 2011 at 4:34 pm <<

We already have 23 GE designed nuclear facilities that use a combo of plutonium and uranium. It's a 7/93 mix (MOX).

Vermont has been trying to shut down their facility (Vermont Yankee) because of radioactive tritium leaks. I believe the VT Senate passed a Bill to shut it down after 2012.

[Log in to Reply](#)

- [MtnWoman](#) March 14th, 2011 at 6:09 pm <<

No, No

There are 23 BWR's in the U.S. but they are not fueled by MOX.

We're building a reprocessing plant at Savannah River but from a Feb 21 article at World Nuclear News:

Excerpt:

While finding a customer for the MOX is of course vital for America's plans, a lengthy trial and approval from the Nuclear Regulatory Commission is required before MOX can be used as routine in a commercial US reactor.

http://www.world-nuclear-news.org/WR_Slow_progress_towards_US_use_of_MOX

Duke Power was going to use at one reactor but they allowed their contract to lapse.

- [TalkingStick](#) March 14th, 2011 at 3:05 pm <

Like three reactor meltdowns? Or a 9.0 earthquake that sets it off?

[Log in to Reply](#)

- [Watt4Bob](#) March 14th, 2011 at 1:31 pm <

Maybe thirty years ago I had a conversation with an engineer who worked on nuclear power plants, his reply to my misgivings about safety issues was that he and the people he worked with were well-trained, well-educated professionals who would never do anything to put anyone at risk and that the systems put in place to safeguard the public were substantial and redundant.

I told him that I had no doubts about his skills or his integrity, but that when, and if the shit hit the fan someday, and he picked up the phone to tell his bosses that they needed to do something immediately, like sound the alarm so people would know it was necessary to evacuate the area, I had serious questions as to whether those power company executives would do the right thing.

The man replied that he worried about that very same thing.

[Log in to Reply](#)

- [garbanzo](#) March 14th, 2011 at 1:50 pm <

I do worry about this here. I live near Davis-Besse. They begged for 10 years to put off their inspections, lied about doing them, and then "discovered" a hole all the way down to the inner reactor cladding, caused by the exact thing (leaking boron coolant) the inspection order had been issued for in the first place.

[Log in to Reply](#)

- [Watt4Bob](#) March 14th, 2011 at 2:11 pm <<

Yes, and while they were lying to the public, they were probably ignoring the advice of their own engineers.

It's sad that when the disaster hits, it's those same engineers who put their lives on the line to fight on the front line in the face of deadly radiation that shortens their lives if it doesn't cause a terrible death.

[Log in to Reply](#)

- [garbanzo](#) March 14th, 2011 at 1:33 pm <<

Take a look at these numbers, Mr Mundane Nuclear Career, and tell us what you think, will ya?

<http://translate.google.com/translate?hl=en&sl=ja&tl=en&u=http%3A%2F%2Fwww.tepco.co.jp%2Ftepcnews%2Findex-j.html> (in the PDF attachments)

People are getting riled up over nothing, if there was an issue it wouldn't be a couple hundred uSv/hr.

[Log in to Reply](#)

- [edve](#) March 14th, 2011 at 2:01 pm <<

Yea! and that man behind the curtain...pay him no mind...nothing to worry about serfs...move on...

People are NOT getting riled up over nothing...folks have legitimate concerns...

so relax yourself 'bean'

[Log in to Reply](#)

- [garbanzo](#) March 14th, 2011 at 2:09 pm <<

abloo abloo the numbers don't back me up they must be lies

qq more

[Log in to Reply](#)

- [Kirk James Murphy, M.D.](#) March 14th, 2011 at 1:52 pm <<

Eufordum, thanks for your participation and the very valid point that a person's source of income can skew their perceptions and assessments of the world outside them. Upton Sinclair described this up nicely in his observation:

'It is difficult to get a man to understand something when his salary depends on his not understanding it.'

WRT to the time required for boil off from spent fuel rod pools, the October, 2000 NRC document describing the consequences of exothermic fires stated:

To establish the times available before fuel uncover, calculations were performed to determine the time to heat the SFP coolant to a point of boiling and then boil the coolant down to 3 feet above the top of the fuel. As can be seen in Table 2.1 below, the time available to take actions before any fuel uncover is 100 hours or more for an SFP in which pressurized-water reactor {PWR} fuel has decayed at least 60 days.

I can't post table 2.1 to the comments, but it states the time for uncover down to three feet above the fuel is 100 hrs for PWR and (of pertinence to Fukushima) is 145 hours. These calculations assume the assemblies have been out of the reactor vessel for at least 60 days. We do not know that this is the case for all assemblies at Fukushima. Moreover, reactor 3 – almost damaged building – contains MOX fuel rods. As the MOX fuel was IIRC only introduced in September 2010 I am hoping that assemblies containing MOX are not yet in the spent rod pools. Were they to be there, I am not certain if the cited NRC document calculations would still hold true, or whether boil off would proceed more rapidly due to greater heat output with MOX.

Your point that the time for boil off is likely greater than one day is well taken: unfortunately, we are now approaching 100 hours after catastrophic power loss at Fukushima. In view of the fact that at least three of the six reactors there are experiencing meltdown within the reactor vessel, the prospect that the six fuel assembly pools in the reactor buildings can be replenished prior to boil off appears to be dismal.

[Log in to Reply](#)

- [garbanzo](#) March 14th, 2011 at 2:21 pm [«](#)

Thanks for actually trying to substantiate this with numbers, it's incredibly frustrating to hear people make absurd claims like "24h to drain the pool" while not being able to put together that the metered radiation would be much higher if that had actually occurred.

I couldn't find anything type-specific, but <http://www.oecd-nea.org/pt/docs/iem/jeju02/session5/SectionV-12.pdf> suggests a cycle time of 369 days on a GE BWR-6 (this is a BWR-4) reactor. What I don't know is if they switch out fuel elements before the full cycle is considered complete.

Overall, if they've been filling the pool at all, or if they can manage to start sometime in the next 2 days it doesn't seem like this will be an issue.

[Log in to Reply](#)

- [Kirk James Murphy, M.D.](#) March 14th, 2011 at 2:33 pm [«](#)

Glad to be of service! I wish I could be glad about the prospect for refilling the spent fuel rod pools in the four reactor buildings which have (not yet) sustained explosions.

Today we've been reading that efforts to cool the meltdown underway in reactor no 2 is hampered by the fact there is only one pumping unit on site.

Even if more pumps are acquired (along with the fuel they require: today we've also read the sole pump at reactor 2 ran out of fuel), we're still left with the problem of getting the water up to the top of the four reactor buildings that haven't (yet) exploded, but were exposed to the full impact of the tsunami. Do the pipes required to convey pumped water to the roof-area spent fuel pools still carry water? Even if they do work, the buildings have lost power. How can remote control valves and control mechanisms (if any) required to operate the filling system function without power?

[Log in to Reply](#)

- [garbanzo](#) March 14th, 2011 at 2:36 pm [«](#)

I read (somewhere) that if they can actually access the level a firetruck should be sufficient. It is an open pool system, with the water level even with the floor. That could turn out to be fortuitous.

I hadn't heard they were down to one pump. That's pretty bad news, along with running out of fuel.

- [garbanzo](#) March 14th, 2011 at 2:34 pm [«](#)

Eh, I guess we'll see. I agree (could anyone not?) that exposing a bunch of rods would be Bad(tm), but so far I don't see much reason to panic. They've kept on top of all the problems so far, and this is a lower priority than keeping the reactors themselves cooled (as the ponds do take a while to evaporate). It doesn't seem real hard to solve either (get a fire truck out there and pump it full again). When I see TEPCO's numbers spike into the hundreds of thousands of uSv and stay there, I'll be worried for sure.

[Log in to Reply](#)

- [Kirk James Murphy, M.D.](#) March 14th, 2011 at 3:23 pm [«](#)

If all the pools were at floor level I'd be much more sanguine about getting a firehose in and pumping water. Unfortunately, the only pool at ground level is the common pool with 6291 assemblies. The other pools – those that still exist – were constructed at the top of each of the six reactor bldgs. Each pool has a capacity of 3450 assemblies.

I hope the very brave engineers on the ground in Fukushima can rewater the reactor pools that still exist, but in at least one building that hasn't yet exploded – reactor 2 – they'll be facing the results of partial meltdown (which itself will be likely to

accelerate evaporation). I fear they will not succeed in the forty or so remaining hours.

And I very much hope I'm wrong.

[Log in to Reply](#)

- [ackack](#) March 14th, 2011 at 3:22 pm [«](#)

With all respect due to your expertise in this area.

NO ONE knows what has happened there!

You can't speak authoritatively on this disaster, because you haven't been there!

We know that there have been releases, detected by the US military flying in helos at least 60 miles from the event. At least 20 people have been exposed to radiation, at the latest reports, 3 severely.

We also know, from studies done regarding the dispersion of chemical and particulate matter from Asia to the US, that prevailing winds WILL bring some degree of fallout to our shores.

We may look at diagrams to our heart's desire, but it is ALL complete speculation, or educated guesses, if you like.

[Log in to Reply](#)

- [tanbark](#) March 14th, 2011 at 5:18 pm [«](#)

AckAck; not all is speculation.

As we have all seen: Nuclear reactors are blowing up like they've been hit with half-ton JDAMS. The Japanese engineers, themselves, are saying that it's likely that there are already partial meltdowns.

The evacuation radius has been increased from 12 miles to about 65 miles. Since about 180,000 people had been evacuated as a result of #1 going up, it's a fair assumption that a lot more people are going to have to leave and find shelter elsewhere, but I haven't seen anything about the new numbers.

I expect that at some point, TEPCO will do a BP and stop releasing information about the cascade of events. At least, until it gets to the point that independent assessments of the situation are relaying the news that very serious amounts of radiation WILL be released into the environment in the very near future.

At that point, a decision will have to be made as to which is more important: the credibilty and well-being of the nuclear power industry... or the lives and health of a lot of human beings.

(The environment is a consideration, too, but as we saw with BP, that's not such a big corporate deal. I mean, you can't even SEE radiation with

the naked eye. Maybe TEPCO can get a temporary ban of radiation detecting devices in the affected areas. With the Japanese stock market starting to tank, and ripple effects throughout the world, there's LOTS of money riding on protecting the corporate status quo.)

[Log in to Reply](#)

17. [edve](#) March 14th, 2011 at 1:16 pm [«](#)

Considering the events taking place...I believe it is logical for people to exchange information and viewpoints as much as possible. It is a dire situation in Japan and it easily could happen here at any time given the idiocy that most of the government and regulatory branches exhibit on a daily basis.

If that means me or like people are biased and anti-nuke...then too goddamn bad!

[Log in to Reply](#)

18. [arete aletheia](#) March 14th, 2011 at 1:21 pm [«](#)

On another note... When a Meltdown occurs what particles are released into the environment/atmosphere? What can people do to protect themselves and loved ones from contamination? Any ideas besides potassium iodine because though that can reduce thyroid contamination it does nothing for radioactive cesium-137, plutonium, strontium 90 and I am sure others I am not aware of... Any ideas.

[Log in to Reply](#)

- [edve](#) March 14th, 2011 at 1:40 pm [«](#)

A partial answer:

Things to know about Cesium-137, "IF" there is a complete meltdown and radioactive Fallout released into the environment

Where does cesium-137 come from?

Radioactive cesium-137 is produced when uranium and plutonium absorb neutrons and undergo fission. Examples of the uses of this process are nuclear reactors and nuclear weapons.

What is the half life of cesium-137 ?

The half-life of cesium-137 is 30 years. Because of the chemical nature of cesium, it moves easily through the environment. This makes the cleanup of cesium-137 difficult.

How do people come in contact with cesium-137?

Walking on contaminated soil could result in external exposure to gamma radiation. People may ingest cesium-137 with food and water, or may inhale it as dust. It is distributed fairly uniformly throughout the body's soft tissues. Exposure may also be external (that is, exposure to its gamma radiation from outside the body).

How can cesium-137 affect people's health?

Exposure to radiation from cesium-137 results in increased risk of cancer. If exposures are very high, serious burns, and even death, can result. The U.S. Environmental Protection Agency says everyone is exposed to minute amounts of cesium-137. The average annual dose in the Northern Hemisphere is less than 1 millirem annually. That falls below the 100 millirem exposure limit the Nuclear Regulatory Commission recommends.

What is the local health danger from the nuclear accident?

People who are outside the immediate area could inhale radioactive particles. A nuclear reactor accident could release radioactive iodine and radioactive cesium. Breathing in or eating food contaminated with radioactive iodine can cause thyroid cancer. Potassium Iodide (or Iodate) tablets can help prevent this.

Contamination of food and water can result from radioactive dust that settles on water supplies, crops or grass. Cows or other animals eat, and it works up the food chain. Any suspected foods should be washed.

Radioactive cesium with its long half-life, can cause more long-term damage, including cancer.

How far might the radioactivity spread?

This depends of course upon how much radioactivity is released into the environment. Weather conditions, wind and rain, will mostly affect the spread.

Is there any danger to those outside of Japan at this time?

Currently there is no established danger being spoken of. There is no evidence of a reactor core breach of the containment vessel.

As for plutonium or plutonium 'dust':

If there is a serious accident involving 600 grams of plutonium (in the form of MOX), how many civilian overdoses could, in principle, result?

IF NONE of the plute is safely contained:
there is a potential for six billion civilian overdoses

IF 90 percent of it is safely contained:
there is a potential for six hundred million civilian overdoses

IF 99.9 percent of it is safely contained:
there is a potential for six hundred thousand civilian overdoses

The probability of a serious accident involving MOX is small, but the consequences can be severe. They can also be very long-lived: since plutonium-239 has a half-life of 24,000 years, plutonium contamination can be permanent. It is a betrayal of public trust to pretend that these risks do not exist.

Info from NRC

[Log in to Reply](#)

- [garbanzo](#) March 14th, 2011 at 1:48 pm [«](#)

Yeah, but MOX is 7% plutonium. You're talking about losing 8751g of MOX fuel, which is a *lot* to aerosolize.

[Log in to Reply](#)

- [Kirk James Murphy, M.D.](#) March 14th, 2011 at 2:08 pm [«](#)

Garbanzo, the 2006 study from the National Research Council of the National Academies describes precisely how the aerosolization can occur. Even if aerosolization were only to disperse half of the MOX fuel, the consequences could be catastrophic.

“The ability to remove decay heat from the spent fuel also would be reduced as the water level drops, especially when it drops below the tops of the fuel assemblies. This would cause temperatures in the fuel assemblies to rise, accelerating the oxidation of the zirconium alloy (zircaloy) cladding that encases the uranium oxide pellets. This oxidation reaction can occur in the presence of both air and steam and is strongly exothermic—that is, the reaction releases large quantities of heat, which can further raise cladding temperatures. The steam reaction also generates large quantities of hydrogen....

These oxidation reactions [with a loss of coolant] can become locally self-sustaining ... at high temperatures (i.e., about a factor of 10 higher than the boiling point of water) if a supply of oxygen and/or steam is available to sustain the reactions.... The result could be a runaway oxidation reaction — referred to in this report as a zirconium cladding fire — that proceeds as a burn front (e.g., as seen in a forest fire or a fireworks sparkler) along the axis of the fuel rod toward the source of oxidant (i.e., air or steam)....

As fuel rod temperatures increase, the gas pressure inside the fuel rod increases and eventually can cause the cladding to balloon out and rupture. At higher temperatures (around 1800° C [approximately 3300°F]), zirconium cladding reacts with the uranium oxide fuel to form a complex molten phase containing zirconium-uranium oxide.

Beginning with the cladding rupture, these events would result in the release of radioactive fission gases and some of the fuel's radioactive material in the form of aerosols into the building that houses the spent fuel pool and possibly into the environment. If the heat from one burning assembly is not dissipated, the fire could spread to other spent fuel assemblies in the pool, producing a propagating zirconium cladding fire.

The high-temperature reaction of zirconium and steam has been described quantitatively since at least the early 1960s....”³

[³ National Research Council, Safety and Security of Commercial Spent Fuel Storage: Public Report. Washington, D.C.: National Academies Press, 2006, on the web at http://www.nap.edu/catalog.php?record_id=11263, pp.38- 39. This report addressed the issue of terrorist attacks on spent fuel pools and the precautions that might be taken in light of the potential severity of the problem.]

[Log in to Reply](#)

- [edve](#) March 14th, 2011 at 2:09 pm <<

“It is a betrayal of public trust to pretend that these risks do not exist.”

It is not the problem that it will evolve like this, just the reality that it could...that it has the potential is un-nerving!

[Log in to Reply](#)

- [edve](#) March 14th, 2011 at 2:13 pm <<

my former reply was addressed to garbanzo...NOT Dr.Kirk...

cannot stand this new FDL comments system...

- [arete aletheia](#) March 14th, 2011 at 1:54 pm <<

“If there is a serious accident involving 600 grams of plutonium (in the form of MOX), how many civilian overdoses could, in principle, result?

IF NONE of the plute is safely contained:there is a potential for six billion civilian overdoses”
very scary.

How much plute in the form of MOX would be released if Fukushima rods all meltdown?

As others have said this is a possibility

[Log in to Reply](#)

- [captjyossarian](#) March 14th, 2011 at 2:39 pm <<

If you know that a radioactive cloud is headed your way, staying indoors helps.

[Log in to Reply](#)

- [MtnWoman](#) March 14th, 2011 at 4:10 pm <<

Some of the media is starting to pay attention to the hazards of the spent fuel pools.

ProPublica posted an article about 3 hours ago – there aren't any answers but at least some of the media is starting to pay attention.

Status of Spent Nuclear Fuel in Question at Crippled Japanese Power Plant

<http://www.propublica.org/article/status-of-spent-nuclear-fuel-in-question-at-crippled-japanese-power-plant>

“At Fukushima, these tanks are attached to the outside of the reactor’s containment structure. The pools are deep – typically the fuel lies under 25 feet of water. Although the concrete-and-steel containment is designed to trap radiation leaks, there is no such protection for pools outside.”

[Log in to Reply](#)

19. [eCAHNomics](#) March 14th, 2011 at 1:27 pm [«](#)

Gee, and I don't have my elementary school desk to duck under anymore.

[Log in to Reply](#)

- [Margaret](#) March 14th, 2011 at 1:42 pm [«](#)

You still have your ass to kiss goodbye though....

[Log in to Reply](#)

- [demi](#) March 14th, 2011 at 1:47 pm [«](#)

OMG. I almost said that. Two peas.

[Log in to Reply](#)

- [Margaret](#) March 14th, 2011 at 1:54 pm [«](#)

The difference is that I love music, you can actually **make** it. :)

[Log in to Reply](#)

20. [tanbark](#) March 14th, 2011 at 1:50 pm [«](#)

Well, Dr. Murphy just climbed up on the dais and took a big shit on the notion that there can't be a fire involving fuel rods...which sounds to my non-expert ear like a worst-case scenario about as bad as a full-on meltdown straight through the bottom of the containment vessels.

And of course, the engineers with TEPCO are demonstrating British Petroleum-like skills at lowballing the living shit out of it. It's just that when you've got nuclear reactors blowing up like they were hit with a half-ton JDAM, it's real hard to present that as a plus.

[Log in to Reply](#)

21. [marymccurnin](#) March 14th, 2011 at 1:51 pm [«](#)

Guess I will leave the Sacramento area and go back to New Orleans. oh wait.....

[Log in to Reply](#)

- [edve](#) March 14th, 2011 at 2:04 pm [«](#)

in the scope of things these daze...no where is safe mary mc c

[Log in to Reply](#)

22. [dkeithgriffiths](#) March 14th, 2011 at 2:05 pm [«](#)

The outcome of the reactor problems will form the basis for my nuclear power opinion going forward. It isn't like people haven't thought of these scenarios in advance. More importantly designed to these scenarios. See (<http://bravenewclimate.com/2011/03/13/fukushima-simple-explanation/>). After reading this I feel confident there is no China syndrome in store for Japan, nor is there a Chernobyl spewing event. But on the other hand I have read just as many articles stating that doomsday is approaching. Time will sort the lies from the truth.

[Log in to Reply](#)

23. [applepie](#) March 14th, 2011 at 2:09 pm [«](#)

Just read this on the UK Guardian site:

The Guardian has also posted a newly released diplomatic cable obtained by WikiLeaks, which records that a high profile Japanese politician told US diplomats that the Japanese government department responsible for nuclear energy – has been “covering up nuclear accidents and obscuring the true costs and problems associated with the nuclear industry”.

Too bad Obama doesn't read WikiLeaks.

[Log in to Reply](#)

- [applepie](#) March 14th, 2011 at 2:12 pm [«](#)

Reminds of that Frank Zappa and The Mothers song from FREAK OUT!

<http://www.youtube.com/watch?v=vKITpVovTAE>

[Log in to Reply](#)

24. [jameshester12](#) March 14th, 2011 at 2:15 pm [«](#)

information on MOX

<http://www.world-nuclear.org/info/inf29.html>

[Log in to Reply](#)

25. [reddog](#) March 14th, 2011 at 2:32 pm [«](#)

If you look at the satellite photographs of the blast damage:

Unit #1 has a roof collapse. Essentially, it pancaked onto the level below it—plain to see. No clue there whatsoever as to the condition of anything below the fallen-in roof.

Unit #3's explosion was more catastrophic. The roof is not visible, the wall of #3's building nearest Unit #2 is blown out and girders from Unit 3's other walls, and maybe roof, have fallen into the building.

No damage can be seen to unit #2's building. If there is any, it's wall nearest #3 was blown inward. I doubt that. If the rods on #2 have been exposed, and I read that they were, then #2 is in the same bad situation that #1 and #3 were in before their explosions.

I suspect that #3's auxilliary equipment and anything else in that building, including the spent fuel storage has been blown away. Hopefully, the reactor containment hasn't been breached, but I would not bet on it. In the satellite photo you can see that they are still able to vent steam to relieve pressure, so some things are still working. But, the steam means that they have a hot core and the venting means that they are trying to keep the reactor vessel pressure low enough so that they can continue to introduce cooling water. I'm not optimistic.

[Log in to Reply](#)

- [dkeithgriffiths](#) March 14th, 2011 at 2:44 pm <<

The building that blew up was simply to keep the weather out. The reason the building blew was the hydrogen that was intentionally release to ease the pressure. The engineers new the risk and it wasn't high. The pipes valves and cooling mechanisms are in a thick concrete containment housing.

[Log in to Reply](#)

- [reddog](#) March 14th, 2011 at 3:01 pm <<

The reactor containment has an opening into the outer building or hydrogen would not have built up inside and steam wouldn't be venting from inside the wreckage. The blast in #3 was extremely large and I doubt that it was deliberate or expected. Damage in #1 was (relatively) light. I'm sure their gas sensors went off the charts right before both blasts, but #3's was obviously much larger and we cannot be sure how much damage was done to the reactor containment below, or to the fuel storage ponds. From the damage visible in the satellite photo the shock to the structure, including the containment, must have been far beyond the design criteria. I'm not using hyperbole, #3's explosion was akin to an extremely large bomb, and if only 10 people were injured they must have been evacuated to several hundred yards or the concussion would have killed them.

[Log in to Reply](#)

26. [dkeithgriffiths](#) March 14th, 2011 at 2:33 pm <<

Is everyone in this thread will to accept nuclear power if containment is achieved? I am willing to join you if it is not.

[Log in to Reply](#)

- [dark knight](#) March 14th, 2011 at 4:14 pm <<

welcome aboard! She just blew!

[Log in to Reply](#)

- [tanbark](#) March 14th, 2011 at 4:47 pm <<

“Welcome aboard. She just blew!”

Gentlemen engineers, start your technical (and oh-so-soothing) explanations of how this could be happening. Or, at the least, pray tell us how this, as the AMERICAN nuclear power community is exhorting us to be, is reason to be enthused about these events.

[Log in to Reply](#)

- [tanbark](#) March 14th, 2011 at 5:02 pm [«](#)

Keith, I'm not willing to accept nuclear power under any circumstances. As we are seeing, it leaves us at the mercy of a high priesthood of nuclear engineers who are very proficient at spreading lots of bullshit to cover up the huge threat that these plants bring with their "clean, cheap, power". (So inexpensive that it won't need to be metered...)

I would suggest that unless your family owns lots of stock in the corporations building and...ahem...maintaining them, all you need to know about them is that the industry has been beating on the doors of the American congress for years, to put a cap on their liability for turning substantial chunks of the american landscape into the stuff of a science fiction nightmare.

Now that the third one has gone up, it's of interest that Garbanzo has gone from soothing reassurances (with instructions that we should listen to nuclear engineers) and scorn for Dr. Murphy's contention that there is a possibility of this turning into "Chernobyl on steroids", to a brief post describing the evacuation of staff, and his conclusion that they are abandoning #2, along with the increase of the evacuation radius from 12 miles to 65 miles.

Give him this; his learning curve is getting better.

[Log in to Reply](#)

27. [SanderO](#) March 14th, 2011 at 2:35 pm [«](#)

There are alternatives but there needs to be the will to pursue them. Nukes are not the way to go. This will happen again.

[Log in to Reply](#)

28. [alamode](#) March 14th, 2011 at 2:39 pm [«](#)

read this

http://online.wsj.com/article/SB10001424052748704893604576198421680697248.html?mod=WSJ_hp_MIDDLETopStories

[Log in to Reply](#)

- [Kirk James Murphy, M.D.](#) March 14th, 2011 at 2:56 pm [«](#)

Thanks for sharing that article: an excellent illustration of Upton Sinclair's aphorism. The opinion piece in the WSJ – titled Japan Does Not Face Another Chernobyl – fails to address the detailed concerns raised in this post. The closest the author comes to the topic of this post is:

“Once the reactor has shut down, there remains “decay heat” from traces of other radioactive isotopes. This can take more than a week to cool down, and the rods must be continually bathed in cooling waters to keep them from overheating.”

The WSJ identifies the author as follows: ‘Mr. Tucker is author of “Terrestrial Energy: How Nuclear Power Will Lead the Green Revolution and End America’s Energy Odyssey” ‘

A cursory google search reveals that Mr. Tucker is a contributor to National Review Online. His previous contributions to corporatist service are summed up elsewhere:

“William Tucker is a veteran journalist. His articles have won the John Hancock Award, the Gerald Loeb Award, the Amos Tuck Award, and he was a finalist for the National Magazine Award. His books include Progress and Privilege: America in the Age of Environmentalism; Vigilante: The Backlash Against Crime in America; and The Excluded American: Homelessness and Housing Policies, which won the Mencken Award. His forthcoming book is entitled Terrestrial Energy: How a Nuclear-Solar Alliance Can Rescue the Planet.

The following is adapted from a lecture delivered at Hillsdale College on January 29, 2008, during a conference on “Free Markets and Politics Today,” co-sponsored by the Center for Constructive Alternatives and the Ludwig von Mises Lecture Series.”

Ludwig von Mises’ disciples include the anti-regulation zealots who successfully destroyed US financial regulations, paving the way for the 2008 financial collapse.

These ideologues have injured America’s economy so severely that most Americans have yet to recover. That’s what they did to our banks – why on earth would we trust these useful idiots with our health – or our children’s health?

[Log in to Reply](#)

- [ThingsComeUndone](#) March 14th, 2011 at 3:16 pm <<

” Ludwig von Mises’ disciples”

Austrian economist Rand and Ron Paul are followers that tells you a lot about his expertise.

Why can’t the MSM get people do lectures at MIT or NASA about nuclear power? I really don’t care for Journalist experts who give lectures to economists.

Find me someone with a science degree and preferably a background in design, construction and repair of Nuclear Power plants.

[Log in to Reply](#)

- [MtnWoman](#) March 14th, 2011 at 6:15 pm <<

Well done Doctor!

[Log in to Reply](#)

29. [TarheelDem](#) March 14th, 2011 at 2:43 pm [«](#)

Before you freak out about this, look up Centralia, Pennsylvania.

All energy sources have risks; we just don't have enough experience with solar and wind generation to know what those are yet. Or how great they are.

This facility (reactor 1) is 40 years old this year. Reactor 6 started commercial operation in 1979. That means that the technology is likely second-generation technology, Chernobyl-style reactors were first generation technology.

The failure here was not a flaw in design or operation, except for siting it in Japan, one of the most seismically active countries in the world. And it took an 8.9 scale earthquake of all the earthquakes in Japanese history over the past 40 years to cause the system to fail.

There are design implications of this failure. (1) Hardening must assume an event of greater than 8.9 for reactors in earthquake zones. (2) Second generation reactors should probably be replaced with newer technology that is designed to tolerate long power outages. (3) Centralization of 6 reactors with two new ones scheduled to come online in the next two years is probably not a good idea. (4) The technology of onsite storage of spent fuel rods (probably the waste disposal method that is most practical) requires some more emphasis as a major research effort.

Nuclear energy is going to be essentially for the delivery of the sort of power requirements of a lot of high-temperature industrial processes. That and powering large surface ships and submarines is its best use. Those are not likely to go away.

They are lousy for powering residential use. Amory Lovins in the 1970s compared the residential use of nuclear power like using a nuclear weapons to cut a pat of butter; it is costly for what it delivers.

More than likely the way we wean ourselves off fossil fuels (remember Centralia) will be by using sources matched locally to uses. Under this logic, Japan is likely stuck with high dependence on nuclear energy to power its cities and industries. The United States is not so constrained, except for maybe Hawaii.

[Log in to Reply](#)

◦ [Kirk James Murphy, M.D.](#) March 14th, 2011 at 3:05 pm [«](#)

Thanks for your interest – I certainly concur with many of your design conclusions (save for replacing reactors with other reactors).

Thanks also for sharing the information from Amory Lovins. I am glad you find his conclusions persuasive. I do, too.

In 2008 he shared his conclusions re nuclear and other sources of energy with Amy Goodman. I hope this excerpt will prove to be of interest.

“Well, first of all, electricity and oil have essentially nothing to do with each other, and anybody who thinks the contrary is really ignorant about energy. Less than two percent of our electricity is made from oil. Less than two percent of our oil makes electricity. Those numbers are falling. And essentially, all the oil

involved is actually the heavy, gooey bottom of the barrel you can't even make mobility fuels out of anyway.

What nuclear would do is displace coal, our most abundant domestic fuel. And this sounds good for climate, but actually, expanding nuclear makes climate change worse, for a very simple reason. Nuclear is incredibly expensive. The costs have just stood up on end lately. Wall Street Journal recently reported that they're about two to four times the cost that the industry was talking about just a year ago. And the result of that is that if you buy more nuclear plants, you're going to get about two to ten times less climate solution per dollar, and you'll get it about twenty to forty times slower, than if you buy instead the cheaper, faster stuff that is walloping nuclear and coal and gas, all kinds of central plans, in the marketplace. And those competitors are efficient use of electricity and what's called micropower, which is both renewables, except big hydro, and making electricity and heat together, in fact, recent buildings, which takes about half of the money, fuel and carbon of making them separately, as we normally do.

So, nuclear cannot actually deliver the climate or the security benefits claimed for it. It's unrelated to oil. And it's grossly uneconomic, which means the nuclear revival that we often hear about is not actually happening. It's a very carefully fabricated illusion. And the reason it isn't happening is there are no buyers. That is, Wall Street is not putting a penny of private capital into the industry, despite 100-plus percent subsidies.

AMY GOODMAN: Why?

AMORY LOVINS: It's uneconomic. It costs, for example, about three times as much as wind power, which is booming.

Let me give you some numbers about what's happening in the marketplace, because that's reality, as far as I'm concerned. I really take markets seriously. 2006, the last full year of data we have, nuclear worldwide added a little bit of capacity, more than all of it from upgrading old plants, because the new ones they built were smaller than the retirements of old plants. So they added 1.4 billion watts. Sounds like a lot. Well, it's about one big plant's worth worldwide. That was less than photovoltaics, solar cells added in capacity. It was a tenth what wind power added. It was a thirtieth to a fortieth of what micropower added.

AMY GOODMAN: What's micropower?

AMORY LOVINS: Again, it's renewables, other than big hydro, plus co-generating electricity and heat together, usually in industry.

In 2006, micropower, for the first time, produced more electricity worldwide than nuclear did. A sixth of the world's electricity is now micropower, a third of the new electricity. In a dozen industrial countries, micropower makes anywhere from a sixth to over half of all the electricity elsewhere. This is not a fringe activity anymore.

China, which has the world's most ambitious nuclear program, by the end of 2006 had seven times that much capacity in distributed renewables, and they were growing it seven times faster. Take a look at 2007, in which the US or Spain or

China added more wind capacity than the world added nuclear capacity. The US added more wind capacity last year than we've added coal capacity in the past five years put together.

And renewables, other than big hydro, got last year \$71 billion of private capital; nuclear, as usual, got zero. It is only bought by central planners with a draw on the public purse. What does this tell you? I mean, what part of the story does anybody who take markets seriously not get? "

[Log in to Reply](#)

- [ThingsComeUndone](#) March 14th, 2011 at 3:21 pm <<

Link and you got a diary:)

[Log in to Reply](#)

- [TarheelDem](#) March 14th, 2011 at 3:51 pm <<

I am aware that Amory Lovins has not changed his position on nuclear energy although folks like Stewart Brand have. I agree with Lovins argument that nuclear has most been bought through direct or indirect drawing on the public purse. But that seems to be what is holding up large-scale deployment of wind and solar as well. Large investments in infrastructure require public absorption of the financial risk. From canals to railroads to rural electrification to initial investments in municipal electric power, that historically has been the case. And part of the reason is that infrastructure improvements are so long term that markets can't or refuse to price them accurately. You can see the same phenomenon in corporate IT departments. Had it not been for the Y2K issue, a lot of corporations would still be running 1970s-era hardware and software just because it had been depreciated off (a different sort of indirect government support).

And I am not advocating new nuclear plants. Most now seem to be sited near concentrations of heavy industry. What I am advocating is replacing 40-year-old nuclear technology with newer technology. Corporations today tend to use obsolete and even unsafe equipment long after they should because it delivers to the bottom line. The currently operating nuclear reactors are not going to go offline anytime soon, even if micropower sops up a large share of the residential market. Having safer and non-dual-use nuclear technology brought online at existing nuclear power plant sites makes a lot of sense to me.

The question that the Japanese face is what to do about the Fukushima plant. Repair only, rebuild with newer technology, or invest the money in other sources of energy that can come online quickly. A joint Japanese-Chinese-Korean-Russian investment in gridded wind generation in the Sea of Japan could have a geopolitical stabilizing effect on the region.

[Log in to Reply](#)

- [darkcycle](#) March 14th, 2011 at 4:20 pm <<

This accident is still ongoing...the potential for this event to poison the entire Northern Hemisphere is entirely real.
Edited in Moderation

Mod Note: Make your case WITHOUT abusing authors or commenters.

[Log in to Reply](#)

- [MtnWoman](#) March 14th, 2011 at 6:18 pm [«](#)

I live not too far from Centralia. The coal fire caused subsidence so it became unsafe. However, it didn't contaminate miles and miles of the surrounding area and make it uninhabitable.

[Log in to Reply](#)

30. [cadogblog](#) March 14th, 2011 at 2:48 pm [«](#)

N.Y.T. has an article with a video embed from Reuters showing the second explosion, watch closely on the left side of the tall structure and you can see large pieces of something, roof?, fuel rod assemblies?, falling to the ground.

<http://www.nytimes.com/2011/03/15/world/asia/15nuclear.html?hp>

[Log in to Reply](#)

- [reddog](#) March 14th, 2011 at 3:04 pm [«](#)

I suspect roof, because there is no roof visible in the satellite photo. Launched far into the air, I might add—one hell of a blast.

[Log in to Reply](#)

31. [dark knight](#) March 14th, 2011 at 4:00 pm [«](#)

Anyone know anything about this 3rd explosion?

[Log in to Reply](#)

- [reddog](#) March 14th, 2011 at 4:08 pm [«](#)

Just saw that the building housing #2 has blown up, details are sketchy.

<http://www.telegraph.co.uk/news/worldnews/asia/japan/8382139/Japan-crisis-third-explosion-raises-spectre-of-nuclear-nightmare.html>

[Log in to Reply](#)

32. [dark knight](#) March 14th, 2011 at 4:12 pm [«](#)

NYT says explosion was “severe”

[Log in to Reply](#)

33. [dkeithgriffiths](#) March 14th, 2011 at 4:19 pm [«](#)

I wasn't very clear. What I meant was given the alternative of high pressure or releasing the gas, wherever it may go, you would opt to keep the pressure down. The primary and secondary containment are well fortified and can withstand the blast. The types of radiation and the amount give the engineers a good reading as to the integrity of the containments. I

know this sounds strange but they are not seeing anything they haven't seen in drills or emergency protocols. They are working through their regressions. The explosion is spectacular and not desirable but not of significant value unless it damages the the primary or secondary containment, which there appears no evidence.

[Log in to Reply](#)

- [AstralTechnician](#) March 14th, 2011 at 4:34 pm [«](#)

"I know this sounds strange but they are not seeing anything they haven't seen in drills or emergency protocols."

Well, except that this isn't a drill...

[Log in to Reply](#)

34. [dark knight](#) March 14th, 2011 at 4:23 pm [«](#)

NYT now says "inner steel containment vessel" at #2 is damaged in this 3rd blast. Possible major radiation leak they also say

[Log in to Reply](#)

35. [garbanzo](#) March 14th, 2011 at 4:36 pm [«](#)

Relay from an ALT in Japan, he says that they're evacuating staff from the facility (unclear whether he meant just reactor 2 or (probably) the whole facility). This means they're abandoning it, and the reactor will either melt down or explode.

The evacuation radius stands at 100km.

[Log in to Reply](#)

- [tanbark](#) March 14th, 2011 at 4:43 pm [«](#)

"This means they're abandoning it and the reactor will either melt down or explode."

Is that what the nuclear experts we should be listening to, are saying?

[Log in to Reply](#)

- [garbanzo](#) March 14th, 2011 at 4:46 pm [«](#)

Well, without someone to refill it, it will melt down. It hasn't so far because they've been pumping in seawater. They can't do that without staff.

Evacuation of #2 reactor has been confirmed by BBC:

http://www.bbc.co.uk/news/world-12740843?utm_source=twitterfeed&utm_medium=twitter

[Log in to Reply](#)

36. [dkeithgriffiths](#) March 14th, 2011 at 4:38 pm [«](#)

If I understand you this is the primary containment. Remember the control rods were inserted minutes after the earthquake. This stopped the nuclear reaction. What they are trying to do is control heat and pressure. When they talk of flooding the containment with

“sea water” they are referring to a processes that would take days and possible weeks to lower the heat of the core. They can flood both the primary and secondary containment units to achieve this effect.

[Log in to Reply](#)

37. [darkcycle](#) March 14th, 2011 at 4:58 pm [«](#)

o.k. So how far is far enough, and how much time to the plume reaching the West Coast?

[Log in to Reply](#)

38. [marksb](#) March 14th, 2011 at 5:02 pm [«](#)

From the NIRS update:

“UPDATE 7:30 pm, Monday, March 14, 2011. Tokyo Electric Power is holding a press conference at this hour. Video stream is at <http://www.ustream.tv/channel/nhk-gtv2>. NHK TV reports that there has been an explosion at Unit 2 at Fukushima Daiichi. There is speculation that this explosion has damaged the primary containment (inside the concrete containment building, which is the secondary containment. Tepco is evacuating some non-essential personnel from the reactor site. 2.5 meters of the core are currently uncovered by water—which means it is almost certainly melting. Winds from the site are currently blowing toward the North.”

North is Tokyo.

Unit #2 is the one with the stuck valve preventing venting, so the explosion could have involved the containment vessel.

2.5m is a lot of core uncooled.

Evacuating staff means immediate or anticipated danger.

This is Bad Shit.

[Log in to Reply](#)

- [marksb](#) March 14th, 2011 at 5:04 pm [«](#)

Sorry, North is NOT Tokyo.

Blame it on my living in a place where West if really South. Sorry.

Russia and prevailing winds that then blow toward us is North.

Argh. Sorry.

[Log in to Reply](#)

39. [darkcycle](#) March 14th, 2011 at 5:23 pm [«](#)

Elliot Spitzer on CNN just had some industry shill on telling us that nuclear will be “part of the mix” of the energy production to come. He went off, breaking news started, and they started talking about the Nukes, using the word “meltdown” now very liberally. This cannot be good.

[Log in to Reply](#)

40. [thirdpartyca](#) March 14th, 2011 at 5:31 pm [«](#)

If there is a full meltdown, I’m sure Obama will help to cover things up the way he helped to lie about the extent of the BP oil spill.

[Log in to Reply](#)

- [tanbark](#) March 14th, 2011 at 6:24 pm [«](#)

You got it, Third. Wasn't it cool the way he had NOAA and the U.S. Coast Guard doing press releases like trained parrots, for BP?

And, Darkcycle: You mean the M-word was being tossed around like a frisbee?

Goodness! There will have to be some corporate phone calls made to some CNN honchos.

[Log in to Reply](#)

- 41. [MtnWoman](#) March 14th, 2011 at 6:20 pm [«](#)

Tokyo Electric Power invested in building nuc plants in Texas. Guess that won't be happening.

NRG Texas nuclear plans seen in doubt after Japan

<http://finance.yahoo.com/news/NRG-Texas-nuclear-plans-seen-rb-2455974181.html?x=0&.v=1&.pf=loans&.mod=pf-loans>

[Log in to Reply](#)

Leave a Reply

You must be [logged in](#) to post a comment.

[« While Libyan Freedom fighters chant 'Where is Obama', Pres sends Marines to capture Bradley Manning's clothes](#)



Welcome to FDL

Login to Firedoglake and participate in our community.

Username:

Password:

Remember Me

Login

Not a member? [Create an account.](#)

Toolbox

Explore

[Find Diaries](#) [Find People](#)

[Site Activity](#) [Find Groups](#)

Become a member of Firedoglake



Benefits include:

- ✓ Membership card
- ✓ Progressive discounts
- ✓ Help plan our future
- ✓ Exclusive FDL chats



[On Wisconsin and Beyond](#)

The war on the working class in Wisconsin, Indiana, Ohio, and more.

SEE PLANS >



[M. East & N. Africa Popular Uprisings](#)

Coverage of protests in Libya, Bahrain, Yemen, Egypt and more



[Private Bradley Manning](#)

Investigating the inhumane conditions of Private Manning's detention



[No New NAFTA](#)

FDL coverage of the new NAFTA-style Korean Free Trade Agreement



[Foreclosure Fraud](#)

Firedoglake uncovers foreclosure fraud across the nation



[Prop 8 Trial](#)

Liveblogging the landmark case in marriage equality and civil rights

MYFDL RECOMMENDED DIARIES

- [Act Now to End the War in Afghanistan](#)
By: [Dennis Kucinich](#) 39 Comments
- [Japan Nuclear Watch: Third Explosion, Possible Cracked Containment at Unit 2](#)
By: [Scarecrow](#) 289 Comments
- [Nuke engineer: Fuel rod fire at Fukushima reactor "would be like Chernobyl on steroids"](#)
By: [Kirk James Murphy, M.D.](#) 120 Comments
- [Chris Hedges responds to the battle for Wisconsin](#)
By: [szielinski](#) 9 Comments
- [Japan Nuclear Watch: Monday Noon Update - 3 Reactors In Partial Meltdown](#)
By: [Bill Egnor](#) 173 Comments
- [TEPCO Has Scandal-Plagued Past](#)
By: [Jim White](#) 35 Comments
- [Wisconsin Farmers Passionately Fight Walker](#)
By: [TobyWollin](#) 18 Comments
- [A Personal Experience with a "True Patriot"](#)
By: [marsdragon](#) 21 Comments
- [Manning Must be Tortured to Make an Example of Him and to Intimidate his Supporters](#)
By: [KevinZeese](#) 5 Comments
- [Why Pollard, Not Manning? Ask John McCain](#)
By: [lvgaldieri](#) 5 Comments

MYFDL RECENT DIARIES

- [100,000 Welcomes for the Wisconsin 14](#)
By: [SJGulitti](#) 0 Comments
- [WIKILEAKS BILLBOARD going up in LOS ANGELES via supporters' pledges...](#)
By: [cynthiahawtin](#) 2 Comments
- [Response To: Democrats: Still Losing the Message War](#)
By: [Grey Wolf](#) 2 Comments
- [Japan Nuclear Watch: Third Explosion, Possible Cracked Containment at Unit 2](#)
By: [Scarecrow](#) 289 Comments
- [Evan Bayh finds a home](#)
By: [szielinski](#) 1 Comments
- [Boehner Speaks directly with Public: Youtube Townhall](#)

- By: [brownpowervote](#) 0 Comments
- [A Personal Experience with a "True Patriot"](#)
By: [marsdragon](#) 21 Comments
- [Tell Obama: No New Nukes!](#)
By: [demandprogress](#) 4 Comments
- [Elections Have Consequences, Right?](#)
By: [dakine01](#) 8 Comments
- [War Is Illegal - Even in Libya](#)
By: [David Swanson](#) 1 Comments
- [The Assange Case: Police Official and Accuser Are Friends](#)
By: [RogerShuler](#) 2 Comments
- [Why Is There No Looting in Japan?](#)
By: [Crane-Station](#) 5 Comments
- [Japan Nuclear Watch: Monday Noon Update - 3 Reactors In Partial Meltdown](#)
By: [Bill Egnor](#) 173 Comments
- [Japan Quake Fallout Shows US Severely Endangered By President Obama's Nuclear Lies and Dems' Abandonment of Clean Energy](#)
By: [normanb](#) 1 Comments
- [Meet the HR3 Ten: Daniel Lipinski, Daddy's Boy](#)
By: [RHRealityCheck](#) 0 Comments
- [Kimi de ite, buji de ite \(Yoko Kanno\) For the people of Japan](#)
By: [GregoriusU](#) 4 Comments
- [TEPCO Has Scandal-Plagued Past](#)
By: [Jim White](#) 35 Comments
- [Act Now to End the War in Afghanistan](#)
By: [Dennis Kucinich](#) 39 Comments
- [Carl Hiaasen is the new Hunter S. Thompson](#)
By: [MountainMan](#) 3 Comments
- [What's the Difference Between...](#)
By: [amghru](#) 4 Comments
- [Chris Hedges responds to the battle for Wisconsin](#)
By: [szielinski](#) 9 Comments
- [Japan Nuclear Watch: Monday a.m. Updates](#)
By: [Scarecrow](#) 169 Comments
- [Second Explosion; Emergencies Continue](#)
By: [Ruth Calvo](#) 7 Comments
- [Nuke engineer: Fuel rod fire at Fukushima reactor "would be like Chernobyl on steroids"](#)
By: [Kirk James Murphy, M.D.](#) 120 Comments
- [Marketing Progress - should we do it/how to do it](#)
By: [athena1](#) 4 Comments

[Read More »](#)



FDL Firedoglake on Facebook

Like

15,383 people like **Firedoglake**.

 Allison	 Patrick	 Terry	 We	 Nick
 Laurel	 Barron	 George	 Julia	 Kevin

 Facebook social plugin

[Home](#) | [Advertise](#) | [RSS Feed](#) | [Register](#) | [Login](#) | [Subscribe to updates](#) | [WordPress](#) | [About](#) | [Contact](#) | [Privacy](#)



[MyFDL](#)

- [Log In](#)
- [Create a Firedoglake Account](#)
- [?](#)



WHEN YOU
SAVE 30%

travelocity
it's GO time

A vertical advertisement for Travelocity. The top portion shows a couple walking on a sandy beach towards the ocean under a blue sky with white clouds. Below this image, the text "WHEN YOU SAVE 30%" is displayed in white on a yellow background. The bottom portion of the ad has a dark blue background. It features the Travelocity logo (a blue star with a white asterisk) and the text "travelocity" in white. Below the logo is an orange button with the text "it's GO time" in white. At the bottom of the ad is a small, knitted gnome figure with a red pointed hat, a white beard, and a blue tunic, holding a large, textured orange star.