

ARE “WE” ASKING TOO MUCH OF ELECTRICITY MARKETS?

CEE 4th Mid-Year Meeting, June 28, 2016

Energy Webs

The [Extremely Complicated Energy] Webs We Weave

<http://www.beg.utexas.edu/energyecon/thinkcorner/Think%20Corner%20-%20Energy%20Webs.pdf>

But first, a story...

- ...in which a large and prominent country/economy experiences a seminal event that alters not only that country's psyche, attitudes and perceptions but...
- ...many others within the region and elsewhere,...
- ...setting global energy markets on a course that defines the foreseeable future while...
- ...

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<http://www.wsj.com/article/environmental-groups-change-tune-on-nuclear-power.html> 1/05/16/00000

BUSINESS

Environmental Groups Change Tune on Nuclear Power

Focus on climate change has raised profile of reactors, now viewed as reliable, carbon-free source of energy



In this 2011 file photo, beachgoers walk near the and 3 of the plant were closed in 2013. PHOTO: AP/WIDEWORLD

By AMY HARDER

June 16, 2016 2:10 p.m. ET

Some of the nation's most influential longstanding opposition to nuclear antinuclear movement as environmental groups change tune on nuclear power.

The change is lowering one of the biggest barriers to the power industry in the U.S. and some struggling reactors are set to shut down.

"Because the historical context is that their absence on the opposition front vice president for governmental and biggest owner of nuclear plants in the U.S. is the Sierra Club.

Nuclear power, which emits no greenhouse gases, is a reliable, carbon-free source of energy.

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<http://www.wsj.com/article/the-sierra-club-still-opposes-nuclear-power.html> 1/05/16/00000

OPINION | LETTERS

The Sierra Club Still Opposes Nuclear Power

It is categorically incorrect to suggest that the Sierra Club considers nuclear power a "bridge" to clean energy.

June 23, 2016 5:28 p.m. ET

"Green Groups Ease Opposition to Nuclear Power" (Business & Tech, June 17) gets it wrong. The Sierra Club remains in firm opposition to dangerous nuclear power. The article reflects wishful thinking on the part of the nuclear industry but doesn't accurately represent the position of the Sierra Club.

It is categorically incorrect to suggest that the Sierra Club considers nuclear power a "bridge" to clean energy. Nuclear power, much like coal, oil and gas, is a bridge to nowhere. In Illinois the Sierra Club is part of a coalition to increase renewable energy and energy efficiency, not preserve nuclear reactors. America's energy future must be powered by 100% clean, renewable energy like wind and solar—and nuclear in no way meets this requirement.

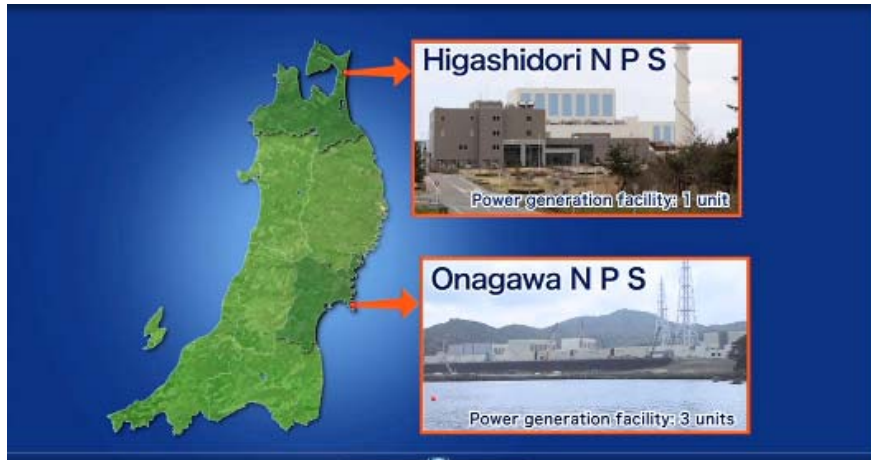
The Sierra Club's successful work to stop and retire coal and gas operations has never precluded our efforts to oppose nuclear power, nor will it ever. Decades of evidence around the world clearly demonstrates that nuclear power remains a dirty and extremely dangerous energy source, and we will continue our efforts to block new reactors from being built and replace existing ones with 100% clean, renewable energy.

Michael Brune

Executive Director

The Sierra Club

Oakland, Calif.

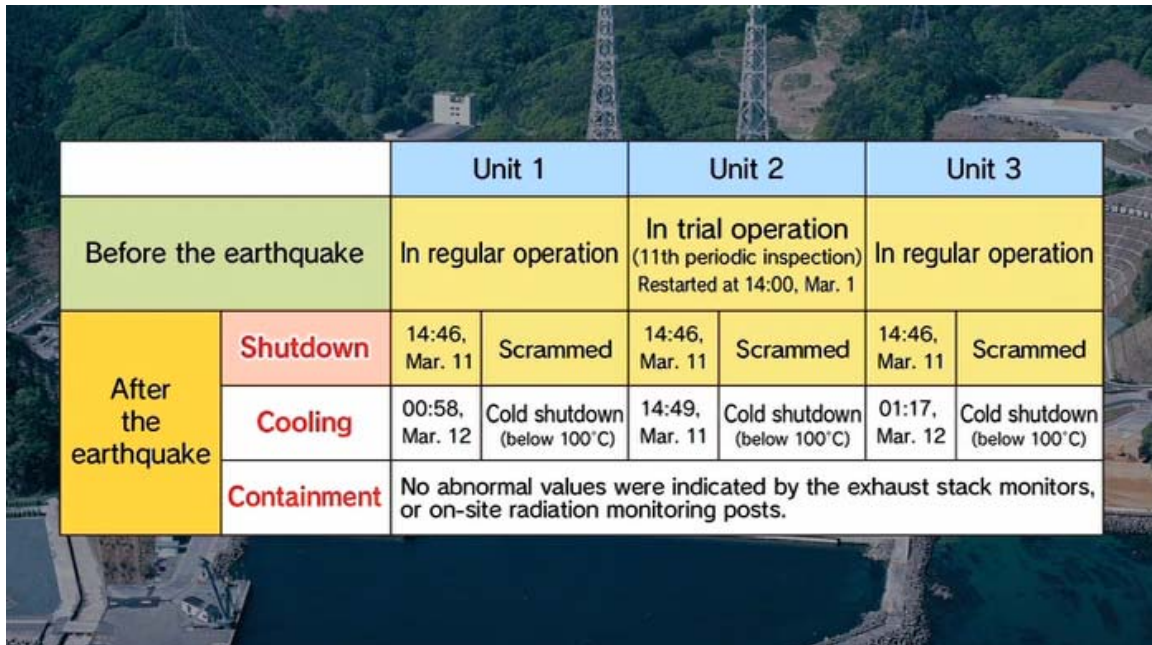


Onagawa – closest BWRs to epicenter

Tsunami height
Onagawa – 13 m, recorded
Fukushima – 13m, estimated



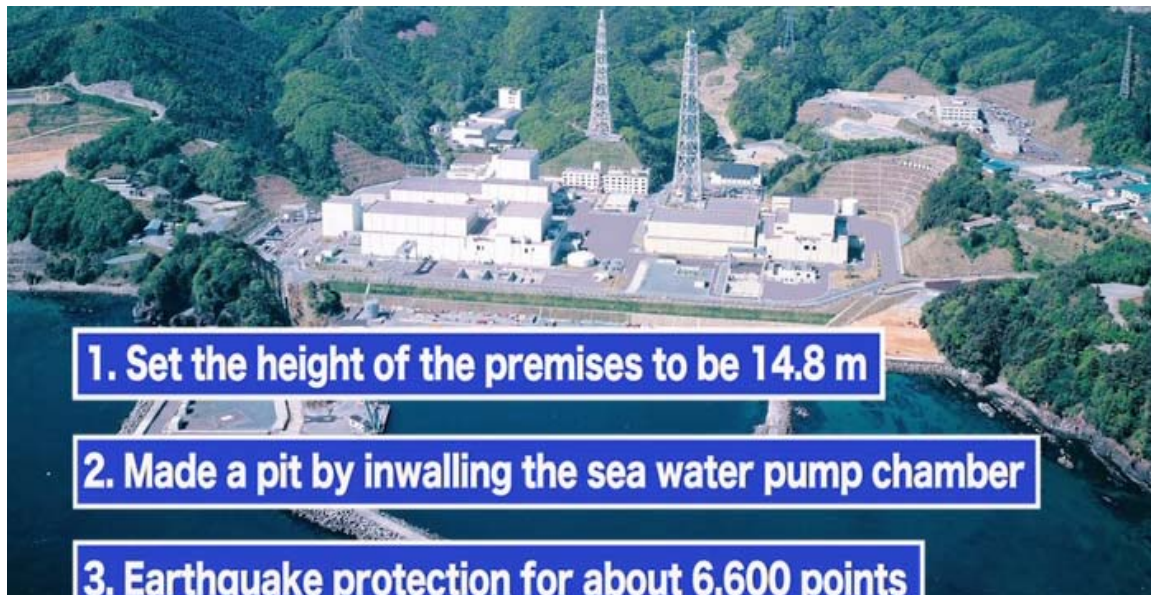
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		Unit 1		Unit 2		Unit 3	
Before the earthquake		In regular operation		In trial operation (11th periodic inspection) Restarted at 14:00, Mar. 1		In regular operation	
After the earthquake	Shutdown	14:46, Mar. 11	Scrammed	14:46, Mar. 11	Scrammed	14:46, Mar. 11	Scrammed
	Cooling	00:58, Mar. 12	Cold shutdown (below 100°C)	14:49, Mar. 11	Cold shutdown (below 100°C)	01:17, Mar. 12	Cold shutdown (below 100°C)
	Containment	No abnormal values were indicated by the exhaust stack monitors, or on-site radiation monitoring posts.					

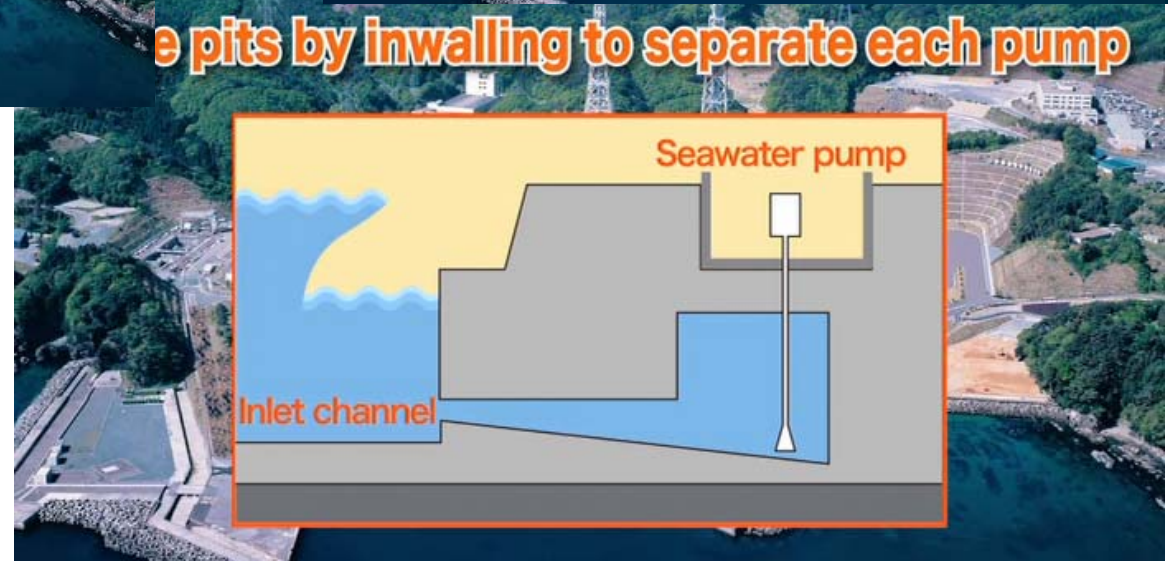


6 of 8 EDGs remained operating – need 1 EDG per unit to keep reactors stable

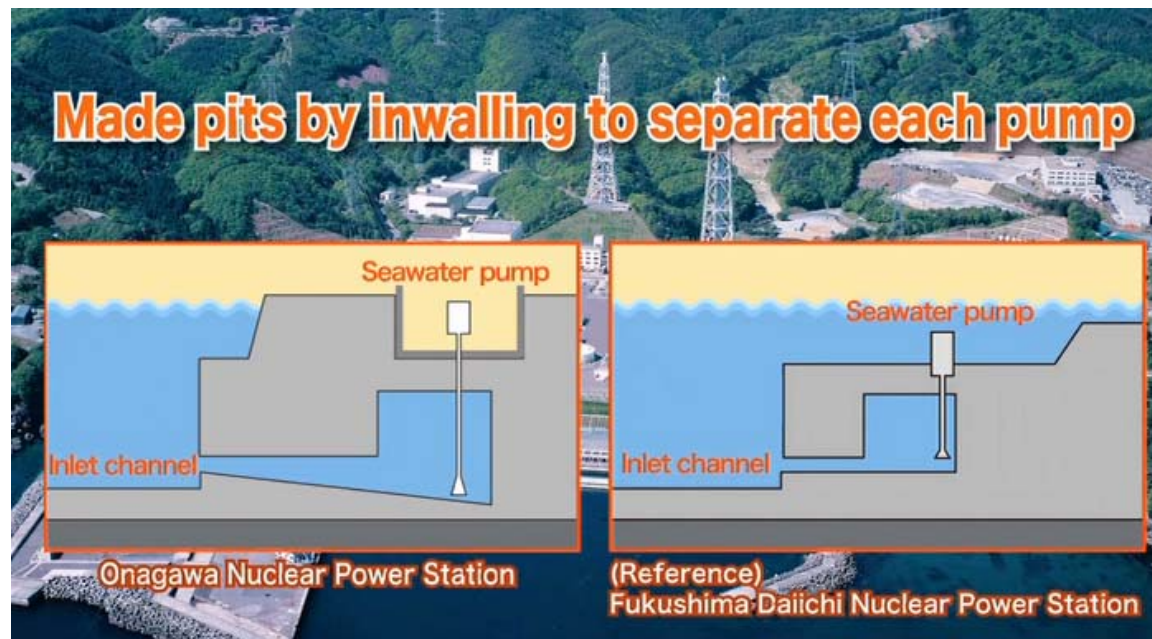


0m – sea level
3m – initial recommendation
9.1m – deeper research on historical events
14.8m – final decision for site elevation

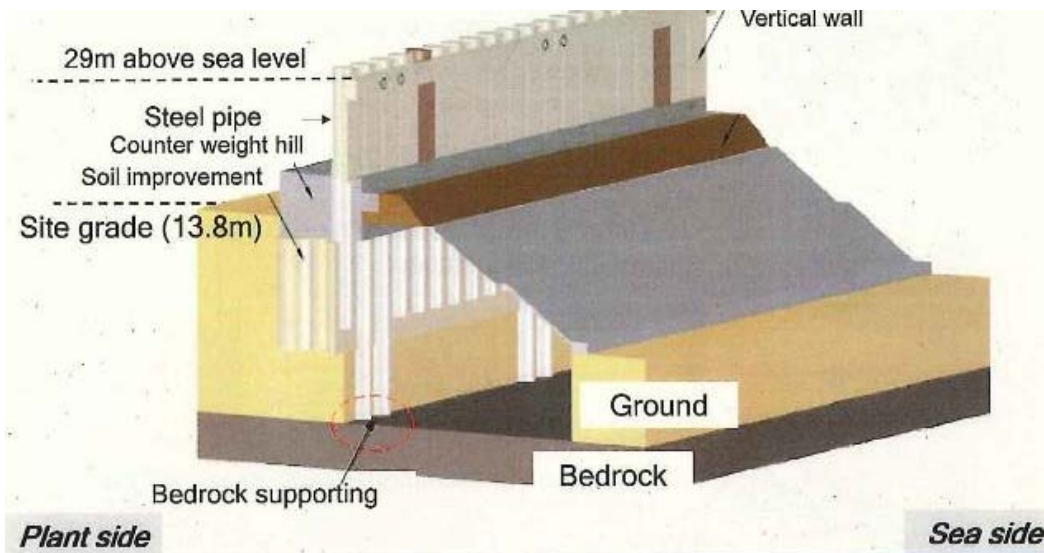
Fukushima site grade – 10m



Drop along water intake sluice
allows water to continue to flow
into pump area to ensure cooling
One for each unit



No sw pumps at harborside (unlike Fukushima)



Working on further safety measures



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