

BEYOND NUCLEAR

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Beyond Nuclear petitions Nuclear Regulatory Commission for suspension of 21 U.S. atomic reactor operating licenses in wake of Japanese nuclear catastrophe

***Watchdog group alleges General Electric Boiling Water Reactor Mark 1 design's
weak containment, inadequate experimental venting back fit, and radioactive waste storage pool
are accidents waiting to happen***

Takoma Park, Maryland – Today the U.S. Nuclear Regulatory Commission (NRC) docketed an emergency enforcement petition filed by the environmental watchdog group Beyond Nuclear. Beyond Nuclear's petition calls for the suspension of operating licenses at 21 General Electric Boiling Water Reactors of the Mark 1 design (GE BWR Mark 1s). Beyond Nuclear has filed the petition in the wake of catastrophic failure of just such containment systems at identical atomic reactors in Fukushima, Japan at the Dai-Ichi nuclear power plant. In addition, Beyond Nuclear has highlighted the extreme risk posed by GE BWR Mark 1 high-level radioactive waste storage pools, at a total of 24 such reactors in the U.S., which lack emergency backup power supplies for circulating cooling water in the event of a loss of electricity from the primary grid. Lack of cooling water circulation in high-level radioactive waste storage pools can result in boil off, subsequent irradiated nuclear fuel fire, and large-scale releases of hazardous radioactivity directly into the environment, as has occurred at Fukushima Dai-Ichi Unit 4.

Beyond Nuclear's Reactor Oversight Project Director, Paul Gunter, has identified 21 GE Mark 1 BWRs in the United States that utilize the Fukushima Dai-Ichi style, free-standing primary containment structure composed of a carbon steel drywell, connected by large diameter piping to the carbon steel suppression chamber referred to as the wet well or torus, which altogether comprises the safety-credited pressure suppression containment system. The 21 GE BWR Mark 1 atomic reactors at risk of catastrophic containment failure in the U.S. are, in alphabetical order: Browns Ferry Units 1, 2, and 3 in Alabama; Cooper Unit 1 in Nebraska; Dresden Units 2 and 3 in Illinois; Duane Arnold Unit 1 in Iowa; Fermi Unit 2 in Michigan; Fitzpatrick Unit 1 in New York; Hatch Units 1 and 2 in Georgia; Hope Creek Unit 1 in New Jersey; Monticello Unit 1 in Minnesota; Nine Mile Point Unit 1 in New York; Oyster Creek Unit 1 in New Jersey; Peach Bottom Units 2 and 3 in Pennsylvania; Pilgrim Unit 1 in Massachusetts; Quad Cities Units 1 and 2 in Illinois; and Vermont Yankee Unit 1 in Vermont.

"The Fukushima Dai-Ichi nuclear catastrophe in Japan has dramatically illuminated the grave risks and unforgiving consequences of a severe accident combined with the fundamental failures of the GE BWR Mark 1 containment concept, design, construction, and subsequent experimental retrofit which unsuccessfully attempted to mitigate these significant flaws," said Gunter. "Any loss of cooling to the reactor core could lead to pressure build up that could breach these old, small, weak, badly designed and built containment structures," he added.

Gunter recounted that high-level U.S. nuclear power regulators have long identified the undue risks associated with GE BWR Mark 1 type containments. In 1972, Dr. Stephen Hanauer of the U.S. Atomic Energy Commission (AEC) warned about the buildup of explosive hydrogen gas during a reactor core accident in such relatively small containment structures, and urged that "the AEC adopt a policy of discouraging further use of pressure suppression containments...".

At Fukushima Dai-Ichi Units 1, 3, and 4, such hydrogen explosions severely damaged or entirely destroyed the secondary containment buildings. This happened despite attempts, in the earliest days of the Fukushima Dai-Ichi nuclear catastrophe, to vent radioactive steam into the environment in an effort to prevent catastrophic rupture of the containment structures.

Also, at Fukushima Dai-Ichi Unit 2, failure of the containment venting system led to a large hydrogen explosion within the primary containment structure which has very likely severely damaged the wet well/torus, creating a direct pathway to the environment for hazardous radioactivity releases. This is made all the worse by the likelihood that the Fukushima Dai-Ichi Unit 2 nuclear fuel core has melted through the bottom of the reactor pressure vessel.

“It is unreasonable to back fit an identified severe design flaw with a venting system to deliberately defeat the purpose of a leak tight containment in order to save it from catastrophic failure based on the unlikelihood that the task will be required,” Gunter surmised.

In addition, safety concerns over the substandard Mark I pressure suppression containment system were again affirmed in 1986 by Dr. Harold Denton, Director of Nuclear Reactor Regulation at NRC. Denton told a nuclear industry conference that this flawed reactor containment type has as high as a 90% chance of failure if challenged by severe accident conditions.

Beyond Nuclear’s emergency enforcement petition, brought under Title 10, Part 2.206 of the Code of Federal Regulations, also calls for emergency diesel generators and backup batteries to be connected to 24 GE BWR Mark 1 reactor units’ storage pools for high-level radioactive waste. Currently, these elevated storage pools for irradiated nuclear fuel are located outside of credited primary containment structures and lack “Class E1” safety-related backup power supply systems in the event of a loss of electricity from the primary grid for running cooling water circulation pumps. These 24 pools include those at the permanently closed Millstone Unit 1 atomic reactor in Connecticut, as well as the Brunswick Units 1 and 2 atomic reactors in North Carolina.

“It is incredible that pools for storing high-level radioactive wastes in the U.S. are not connected to emergency backup power supplies,” said Kevin Kamps, Radioactive Waste Watchdog at Beyond Nuclear. “Any loss of the electrical grid – whether due to tornadoes, hurricanes, ice storms, or even wildlife or tree branches touching power lines – could begin pool boiling within hours, leading to complete boil off within a day or two, followed by a radioactive waste inferno within hours of the irradiated nuclear fuel losing its cooling water cover,” Kamps added.

“Whereas Fukushima Dai-Ichi Unit 4’s pool contained around 130 tons of high-level radioactive waste, pools in the U.S. are crammed with significantly more,” Kamps added. “For example, Fermi Unit 2 in Michigan – the largest GE BWR Mark 1 in the world – has well over 500 tons of high-level radioactive waste crammed into its pool. This means that without the primary electrical grid, the pool could begin boiling in just over four hours, could boil dry and catch fire all that much more quickly, and the consequences downwind would be multiple times worse than the still-unfolding catastrophe at Fukushima Dai-Ichi Unit 4’s pool,” Kamps concluded.

A 1997 study commissioned by the NRC estimated the median consequences of a high-level radioactive waste storage pool fire, which included: 54,000 to 143,000 latent cancer deaths downwind; 770 to 2,700 square miles of agricultural land condemned; and economic costs due to evacuation of \$117 to 566 billion (\$158 to 765 billion when adjusted for inflation to current dollar values).

Beyond Nuclear's 2.206 emergency enforcement petition, and NRC's docketing announcement, are posted at the top of Beyond Nuclear's homepage, www.beyondnuclear.org, and can be provided upon request.

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Beyond Nuclear aims to educate and activate the public about the connections between nuclear power and nuclear weapons and the need to abandon both to safeguard our future. Beyond Nuclear advocates for an energy future that is sustainable, benign and democratic.