9/18/2013
78FR57418
(1)

RECEIVED
2013 OCT 18 AM 9: 23
RULES AND DIRECTIVES BRANCH USNRC

Docket No. NRC-2013-0215

Japan Lessons Learned Directorate

NRR, U.S.N.R.C.

October 18, 2013

Pilgrim Watch Comment Regarding Japan Lessons-Learned Project Directorate Interim Staff Guidance JLD-ISG-2013-02; Compliance with Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions

Pilgrim Watch ((hereinafter "PW"), a public safety advocacy group located within Pilgrim NPS's EPZ herein comments in response to NRC's request for public comments on draft JLD-ISG-2013-02. JLD-ISG provides guidance and clarification to assist nuclear power reactors applicants and licensees with the identification of measures needed to comply with requirements to mitigate challenges to key safety functions.

Our major concerns are that:

- Implementation of the Order should be no more than 2 years, not six years. In the interim, the Order EA-13-109 clearly indicates that prior to implementation of the Order public health and safety is not assured.
- The Order wrongly provides an "escape hatch" so that licensees will not have to install a dry well vent if, they can come up with a "good enough story."
- The order does not protect public health and safety because there is no requirement for filters or rupture discs. Unless filters and rupture discs are required at the same time hardening of the vent(s) for post-accident conditions are required, it is very unlikely those measures never will be required. Industry will argue that it is overburdened by implementing fixes to the vents piecemeal. The Commission kicked the "filter" can down

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM-03
Add= R. Aulick (RCA)

the road by its vote in support of Option 2. We are down that road, now.

A. Implementation of EA-13-109

NRC's schedule for implementing EA-13-109 is too long; instead, it should be within 2 years at the maximum. This recognizes that the status quo does not protect public health, safety and property; therefore it is not reasonable to delay implementation to "no later than startup from the first refueling outage that begins after June 30, 2017, or June 30, 2019." PW asserts that implementation in fact could happen far sooner as set forth below.

1. A Filtered Venting Containment System is now, and for some time has been, commercially available from AREVA. AREVA's brochure[1] explains that it is "[e]asy to backfit in part due to compact design;" and says that their "extensive full system installation experience allows us to complete commissioning one and a half years from date of order." (Emphasis added)

Quick Delivery and Integration

AREVA prefabricates the filter vessel and performs preliminary erection work while the plant is still online and completes installation during a normal outage. Our extensive full system installation experience allows us to complete commissioning one and a half years from date of order.

To accelerate backfitting into power plants already in operation, or if transportation of the complete system is not feasible, the filtering system can be assembled on-site. AREVA has both the know-how and the experience to deliver and combine the complete venting system to the plants in operation including civil works if required.

[1] http://www.areva.com/globaloffer/liblocal/docs/Brochures/AREVA_Filtered-Containment-Venting-System_vEN.pdf

Japanese BWRs will be fitted with AREVA supplied filtered containment venting systems and implemented on a short-term schedule. For example, Kashiwazaki-Kariwa NPS finish date was summer, 2013.

2. Pilgrim, for example, was the first reactor to install a DTV system. It took approximately 18 months, not 6 years, to install the first DTV system. A Memorandum presented by David Dixon, Town of Plymouth Nuclear Matters Committee to both the Plymouth Selectmen, 07.06.90 and Massachusetts Joint Committee on Energy, 02.27.90 (attached) says that on "September, 1987. Installation of the DTVS vent line is occurring." (Item 8) and on "January 1989. "The DTVS was made operational." (Item 16)

3. Given all the industry's experience with DTV systems over the past 25 years, there is no reason to expect that a second vent could not be installed in less than 18 months. Neither is there any reason that such a vent could not be installed simultaneously with the installation of a Filtered Venting Containment system, and that both jobs could not be completed in a year and a half.

4. The history of previous time-lines for installations shows that the Filtered Venting Containment System and second vent can easily installed in far less than six years. For example: Pilgrim received its Special Permit from the Town of Plymouth in 1967 and became operational in 1972; in other words the site was prepared and reactor constructed in less than five years. In the 1990's, the major reactor modification was the alternate decay heat removal system. It took 2-4 years. In the 2000s, the reactor vessel head replacement modification became widespread, taking 2 to 4 years. More recently, the NRC issued three orders in March 2012 for Fukushima modifications with a requirement they be installed no later than end of year 2016 -- a four year deadline.

5. PW expects that the core problem is that the NRC's implementation schedule is driven by utility refueling outage schedules by allowing licensees to wait one outage to take measurements and then wait another outage to finally install the vent. There is no basis to build this schedule around outage schedules. It simply requires a shutdown at any time to take measurements and another shut down to install.

6. The likely true explanation for the Order's implementation schedule is that NRC wants to delay installation because the cost to install vents would cause shutdowns of plants like Fitzpatrick and Pilgrim. These reactors are in financial trouble because of low prices in their respective deregulated energy markets and the NRC does not want to push some of these reactors into closure. The message to us is that reactor profits from delay mean more than public safety. If NRC wants to prove us wrong, as we sincerely hope, and satisfy its AEA obligations to protect public health and safety then it will require installation in one to one and a half years. Absent the full implementation of filtered and passive wetwell and drywell vents, there is no reasonable assurance. NRC knows this. PW herein includes direct quotes from the actual Order EA-13-109, that show public health and safety is not protected today.

EA-13-109 Says That the Status Quo Does Not Protect Public Health, Safety and Property

> The NRC determined that the issuance of EA-12-050 and implementation of the Order ***were necessary*** to provide reasonable assurance of adequate protection of public health and safety. (pgs., 2, 3)
>
> EA-12-050...***was necessary*** to provide reasonable assurance of adequate protection of public health and safety." (pg., 5)
>
> The NRC has concluded that (1) the requirement to provide a reliable HCVS to prevent or limit core damage upon loss of heat removal capability ***is necessary*** to ensure reasonable assurance of adequate protection of public health and safety. (EA-13-109, 10)

Among the qualitative factors, one of the more important is enhancing the defense-in depth characteristics of Mark I and Mark II containments by *addressing the relatively high probability that those containments* ***would fail*** *should an accident progress to melting the core* ...The installation of a reliable, severe accident capable containment venting system, in combination with other actions such as ensuring drywell flooding capabilities, reduces the likelihood of containment failures and thereby enhances the defense-in-depth protections in plants with Mark I and Mark II containments." (pg., 6; Emphasis added)

During severe accidents involving molten core debris breaching the reactor vessel, mitigating strategies include injecting water into the containment to help prevent drywell liner melt-through, which ***would result*** in a release pathway directly into the reactor building. However, *water injection can eventually increase the water level in the suppression pool to a point where venting from the wetwell would no longer be possible. Without venting containment pressure could continue to increase, threatening containment failure.*" (EA-13-109, 7; Emphasis added)

These *modifications* ***are needed to protect health and to minimize danger to life or property*** because they will give licensees greater capabilities to respond to severe accidents and limit the uncontrolled release of radioactive materials. In such situations, the Commission may act in accordance with its statutory authority under Section 161 of the Atomic safety Energy Act of 1954, as amended, *to require Licensees to take appropriate action to reduce risks posed to the public from the operation of nuclear power plants*. (EA-13-109, 7; emphasis added)

[P]pursuant to 10 CFR 2,202, the NRC finds the public health, safety and interest ***require*** that this Order (EA-13-109) be made immediately effective. (EA-13-109, 10)

The NRC's own statements in these orders lead to only one conclusion: public safety, health and property are not protected today. The NRC cannot pretend to satisfy its AEA obligation to protect the public health and safety now by allowing these reactors to operate - for at least six years - until EA-12-050 provisions, as revised by EA-13-109, and EA-13-109 might finally be fully implemented. **Making the order "immediately effective" is meaningless**

when the order does not require anything to be done for many years. Two years is reasonable, six years is not reasonable.

7. Starting essentially from scratch, the U.S. built the massive machine needed to win, and won World War II in 4 years. During that period a huge number of battleships and airplanes were built. It took only 16 month to build the Pentagon.

8. Any contention that 6 years is needed to install a vent or a filtered vent system is laughable. We recognize that some reactor owners do not want to spend any money. They should be given a choice – either complete installation within 18-24 months, or .permanently cease operations and begin decommissioning within two years.

B. **Order EA-13-109 Wrongly Provides an "Escape Hatch"**

EA-13-109 says (at 8) that, "This Order requires licensees with Mark I and Mark II containments to either install a severe accident capable drywell venting system or develop and implement a reliable containment venting strategy that makes it unlikely that a licensee would need to vent from the containment drywell during severe accident conditions." How does "unlikely that a licensee would need to vent from the containment drywell during severe accident conditions" provide reasonable assurance? NRC should not defer to the industry to allow it to come up with reasonable sounding "strategy" in order to save money and get off the hook. We believe that the ultimate takeaway from Fukushima is accidents happen. Nuclear power is a technology that could have 40 or so great years that could to be wiped out in one day. There were five meltdowns (TMI, Chernobyl, Unit 1, Unit 2, Unit 3) in about 400 reactors worldwide that

equates to about one per decade, not one in a million. EA-13-109 inexcusably allows the licensee to come up with an excuse so as not to incur the expense of installation.

C. Order Does Not Satisfies NRC's Statutory Obligations

The Orders do not consider quite obvious problems that must be addressed if the public health, safety and property are to be adequately protected. Implementation should include installation of filters and rupture discs.

(a) **Filtering:** The Order acknowledges that "venting the containment during severe accident conditions could result in the release of radioactive materials." (EA-13-109, 5) It also says that issues relating to filtering will be addressed through the rulemaking process (EA-13-109, 4-5); in other words, not any time soon. Until filters are actually required ***and installed,*** we are "out of luck" if the vents are opened; and there is no assurance that our health and property will be protected.

No one can deny the fact that venting **will** result in the release of radioactive materials. Orders that do not require licensees to do anything to insure that releases through a vent do not contain radioactive material, fail to protect public health, safety and property.

Neither can anyone deny the fact that neither the status quo nor the orders require licensees to do anything to insure that a release from such vents do not contain radioactive materials - materials that would clearly have an adverse effect on the public health in the event that it is necessary to release or to assure that operators follow orders to open the vent. As in Japan, even properly trained operators here are likely to decide not to open the vent when they should because they fear the effects offsite of significant unfiltered release and onsite on

workers capability to perform operations resulting in containment failure and significant releases.

EA-12-050 incorrectly assumed that scrubbing in the wetwell will adequately filter releases. The FILTRA system installed at the Swedish Barsebäck nuclear power station, Switzerland and soon in Japan, for example, is in addition to any filtration provided by the wetwell pool, not in place of it.[2] SECY-12-0157 showed that NRC knows this to be so.

Furthermore, it's not clear how effective the filter effect of the wetwell on its own really is. A U.S. report from 1988 entitled "Filtered venting considerations in the United States[3]" writes:

> Within the United States, the only commercial reactors approved to vent during severe accidents are boiling water reactors having water suppression pools. The pool serves to scrub and retain radionuclides. The degree of effectiveness has generated some debate within the technical community. The decontamination factor (DF) associated with suppression pool scrubbing can range anywhere from one (no scrubbing) to well over 1000 (99.9 % effective). This wide band is a function of the accident scenario and composition of the fission products, the pathway to the pool (through spargers, downcomers, etc.), and the conditions in the pool itself. Conservative DF values of five for scrubbing in MARK I suppression pools, and 10 for MARK II and MARK III suppression pools have recently been proposed for licensing review purposes. These factors, of course, exclude considerations of noble gases, which would not be retained in the pool. (Emphasis added)

The decontamination factor of 5 for the Mark I containment (as used in units 1 through 5 of Fukushima Daiichi and the 23 in the U.S.) means that although 80% of the radioactive substances (excluding noble gases) may be retained, 20% is released. The FILTRA system

---

[2] The filtered venting system under construction at Barseback,1 Aug 1985 ... A filter venting containment system, bearing the acronym FILTRA will be installed at the Swedish nuclear power plant Barseback. http://www.osti.gov/energycitations/product.biblio.jsp?osti_id=6309422

[3] Filtered Venting Considerations in the United States, R. Jack Oallman, L.G. (Jerry) Human, John (Jack) Kudrick:: http://www.osti.gov/energycitations/purl.cover.jsp?purl=/6945722-maXGrD/6945722.pdf

installed at 10 Swedish nuclear power plants and one in Switzerland is designed to ensure that in a severe accident 99.9% of core inventory is retained in the containment or the filters.

The difference between the Mark I's release of 20% and FILTRA's 0.1% is huge; it means up to 200 times more radioactivity is released in the system defended by TEPCO and U.S. BWR Mark I operators than by the enhanced system used in Europe and commercially available worldwide.

Japan has shown that the U.S. industry's and NRC assumptions of the scrubbing effectiveness of the wetwell are wrong. Dr. Frank von Hippel explained this to the NRC over thirty years ago.

> For accidents in which the damage is sufficient to open large pathways from the core to the containment, there will not be sufficient water available to trap the radioactive materials of concern, nor will the pathway be so torturous that a significant amount wills tick to surfaces before reaching the containment atmosphere. Similarly if the containment fails early enough, there will be insufficient time for aerosols to settle in the reactor building floor.[4]

A year after Fukushima, Dr. von Hipple repeated his warning, in *Second chances: Containment of a reactor meltdown,* Bulletin of Atomic Scientists, March 14, 2012[5] that:

> The unspoken argument against requiring that US nuclear power plants be retrofitted with filtered vents was that the industry thought that they were already safe enough and that the expense would be wasteful. And, as today, the commission did not want to force the industry to do more than it was willing to do.
>
> In 2002, the NRC, despite alarming evidence that a pressure vessel had almost corroded through, refused to force an owner to shutdown the reactor for inspection before its regular refueling shutdown. After a review, the NRC's own inspector

---

[4] Bulletin of Atomic Scientists: Containment of a Reactor Meltdown, Frank von Hippel, March 15, 2011, note 16 (Attached, Exhibit 8)

[5] http://thebulletin.org/print/web-edition/features/second-chances-containment-of-reactor-meltdown

general concluded: "NRC appears to have informally established an unreasonably high burden of requiring absolute proof of a safety problem, versus lack of a reasonable assurance of maintaining public health and safety."

We failed after Three Mile Island in 1979 to reform the Nuclear Regulatory Commission or force improved containment designs. The tragedy in Japan may have given us another opportunity

In EA-13-109's drywell vent, there clearly is **no** scrubbing capability. But the Order "passes the buck" by saying that, "This loss of filtering capability is an issue that will be resolved as part of the NRC rulemaking addressing broader severe accident management and filtering strategies." (EA-13-109, 8) The NRC certainly knows that rulemaking takes a very long time. In the interim, public health, safety and property are not provided reasonable assurance.

(b) Rupture Discs: The Order fails adequately to protect the public health and safety for another reason. It does nothing to insure venting without operator intervention. Vents can fail to open for a number of reasons, including human error, equipment failure and high radiation fields; if the vent does not open when it should, the likely result will be containment failure. During the NRC May 2, 2012 Public Meeting Order EA-12-050 Mary Lampert asked the technical staff whether they saw any downside to rupture discs, paired with filters. Robert Dennig, Branch Chief Technical Staff Containment and Vent Branch NRR, responded, "No."

This is another way in which the status quo does not adequately protect the public health and safety. Unless the NRC requires licensees such as Pilgrim to do more than the Orders require, that will continue to be the case.

Thank you for your consideration.

Mary Lampert
Pilgrim watch, Director
148 Washington Street
Duxbury, MA 02332
Tel. 781-934-0389
Email: mary.lampert@comcast.enet
October 18, 2013