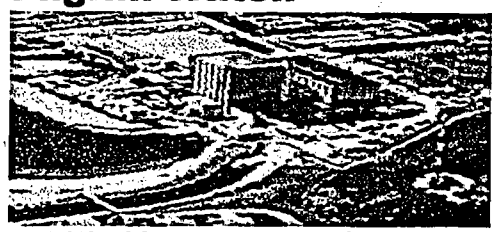
Pilgrim Watch



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Subject: **Added Comments Regarding Scope of the Environmental Review for the Pilgrim Nuclear Power Station's License Renewal Application- Direct Torus Vent System -**
Federal Register Notice, April 14, 2006 (72 FR 19554)

On behalf of Pilgrim Watch, I am submitting the following added comments, Section X, to those submitted June 12, 2006 regarding the need to add a filter to the Direct Torus Vent System (DTVS).

The faulty SAMA analysis used by Entergy in the Environmental Report caused it to wrongly dismiss mitigation alternatives such as adding a filter to the Direct Torus Vent

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The purpose of a SAMA review is to ensure that any plant changes that have a potential for significantly improving severe accident safety performance are identified and addressed. *Duke Energy Corp., supra* at 5. For its SAMA analysis, the Pilgrim Environmental Report explains that, "A cost benefit analysis was performed on each of the remaining SAMA candidates. If the implementation cost of a SAMA candidate was determined to be greater than the potential benefit (i.e. there was a negative net value) the SAMA candidate was considered not to be cost beneficial and was not retained as a potential enhancement. . . "The benefit of implementing a SAMA candidate was estimated in terms of averted consequences."[1] One example of how a poorly performed SAMA analysis can lead to erroneous conclusions is the ER's look at the costs and benefits of installing a Direct Torus Vent filter at Pilgrim.

The Direct Torus Vent System (DTVS) is a method to relieve the high pressure which is generated during a severe accident. In 1986, Harold Denton, then the NRC's top safety official, told an industry trade group that the "Mark I containment, especially being smaller with lower design pressure, in spite of the suppression pool, if you look at the WASH 1400 safety study, you'll find something like a 90% probability of that containment failing." *Hazards of Boiling Water Reactors in the United States,* Paul Gunter, Nuclear Information Resource Service, Washington, D.C. (March 1996). In order to protect the Mark I containment from a total rupture it was determined necessary to vent a high pressure buildup. As a result, an industry workgroup designed and installed the "Direct Torus Vent System" at all Mark I reactors,

[1] Operating License Renewal Stage, E.2.3 Final Screening and Cost Benefit Evaluation of SAMA Candidates (Phase II). "Values for avoided public and occupational health risk were converted to a monetary equivalent (dollars) via application of the NUREG/BR-0184 (Reference E.2-19) conversion factor of $2,000 per person rem and discounted to present value. Values for avoided off-site economic costs were also discounted to present value."

including Pilgrim. Operated from the control room, the vent is a reinforced pipe installed in the torus and designed to release radioactive high pressure steam generated in a severe accident by allowing the unfiltered release directly to the atmosphere through the 300 foot vent stack. Use of the vent discharges steam and radioactive material directly to the atmosphere bypassing the standby gas treatment system (SBGTS) filters normally used to process releases via the containment ventilation pathway. There is no radiation monitor on the pipe and valves that comprise the DTV line. William J. Raymond, Senior Resident Inspector, Pilgrim Nuclear Power Station, USNRC, Region I, Branch 5, email correspondence, May 11, 2006.

In response to a question posed by the Town of Plymouth at a public meeting on June 21, 1990 about the decontamination factors for the torus pool of various isotopes, the NRC spokesperson responded that, "Except for the noble gases (consisting of the isotopes of Xenon and Krypton), which are not retained in the pool to any significant degree, the suppression pool is highly effective in scrubbing out and retaining particulate and volatile fission products. Calculations as well as tests indicate that the suppression pool would be expected to have a realistic decontamination factor (DF) for particulate and volatile fission products of about 100, depending upon the accident sequence and the temperature of the water. This means that about 1% of the particulate and volatile radioactivity entering the pool would be released to the atmosphere, and about 99% would be retained within the pool." Although the NRC spokesman appeared to dismiss this as a trivial release, Dr. Frank von Hippel analyzed the applicant's response and stated that there is an internal contradiction in what we are being told. "The NRC believes that the release from a severe core-melt accident

would be reduced [by the suppression pool] by a factor of one hundred. This is considerably more optimistic than estimated in the NRC's first study on the subject. WASH-1400, *The Reactor Safety Study*, WASH-1400 (1975). *Also known as The Rasmussen Report.* Also, the contention is that the reduction by a filtration system would have zero benefit. Here the contenders seem to be assuming that a factor of one hundred equals 100%. That is false. Even a release of on the order of 1 percent of the core's radioactive iodine and cesium would be a very severe event." Frank Von Hippel, Program of Science and Global Security, Princeton University, e-mail correspondence, March, 19, 2006.

In its Environmental Report, Entergy analyzes the benefits of installing a filter to the torus vent in the course of reviewing possible severe accident mitigation alternatives. The Pilgrim ER states, "Filtered Vent: This analysis case was used to evaluate the change in plant risk from installing a filtered containment vent to provide fission product scrubbing. A bounding analysis was performed by reducing the successful torus venting accident progression source terms by a factor of 2 to reflect the additional filtered capability. Reducing the releases from the vent path resulted in **no benefit.** This analysis case was used to model the benefit of phase II SAMAs 2 and 19." (E.2-5). The Report then states, "Basis for Conclusion: Successful torus venting accident progressions source terms are reduced by a factor of 2 to reflect the additional filtered capability. The cost of implementing SAMA at Peach Bottom was estimated to be $3 million. Therefore this SAMA is not cost effective for [Pilgrim]." (E.2-24). (emphasis added) In other words, as they show in Table E.2-1, Entergy has determined that in return for a cost of $3,000,000.00, there will be no (0.00%) benefit to public health and safety.

It is not clear to Petitioners how it is possible to find zero (0.00%) benefit from installing a filter that would reduce by a factor of two the radioactive venting to the public in the case of a severe accident. Unfiltered venting has been judged unsafe by all regulatory agencies outside the United States. David C. Dixon, *Pilgrim Direct Torus Vent System*, Presentation to Massachusetts Joint Committee on Energy (February 27, 1990). In its analysis of several risk contributors to Core Damage Frequency in Section E.1, the disposition of those events in Table E.1-3 frequently included "venting via DTV path to reduce containment pressure." In other words, a filter in the torus vent could reduce the impact in ***many*** possible severe accidents. The only conclusion to draw from the outcome of the DTV filter SAMA analysis is that, as discussed above, Entergy has used the MACCS2 code to downplay the health and economic costs of severe accidents and used the Probabilistic Safety Analysis (PSA) model to make the benefits of mitigation appear to be zero.

We respectfully request the ER to include a review of Entergy's analysis. In addition we request the studies that NRC is currently depending to support NRC's assertion that the release from a severe core melt accident would be reduced by a factor of one hundred. This is considerably more optimistic than estimated in NRC's first study on the subject (WASH-1400, 1975). Last, if the NRC agrees with Entergy's analysis that a filter's benefit is not worth the cost to present to the public both NRC's and Entergy's complete calculations and supporting studies.

Respectfully submitted for Pilgrim Watch,

Mary Lampert