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September 1, 1989

TO: ALL HOLDERS OF OPERATING LICENSES FOR NUCLEAR POWER REACTORS WITH MARK I CONTAINMENTS

SUBJECT: INSTALLATION OF A HARDENED WETWELL VENT (GENERIC LETTER 89-16)

As a part of a comprehensive plan for closing severe accident issues, the staff undertook a program to determine if any actions should be taken, on a generic basis, to reduce the vulnerability of BWR Mark I containments to severe accident challenges. At the conclusion of the Mark I Containment Performance Improvement Program, the staff identified a number of plant modifications that substantially enhance the plants' capability to both prevent and mitigate the consequences of severe accidents. The improvements that were recommended include (1) improved hardened wetwell vent capability, (2) improved reactor pressure vessel depressurization system reliability, (3) an alternative water supply to the reactor vessel and drywell sprays, and (4) updated emergency procedures and training. The staff as part of that effort also evaluated various mechanisms for implementing of these plant improvements so that the licensee and the staff efforts would result in a coordinated coherent approach to resolution of severe accident issues in accordance with the Commission's severe accident policy.

After considering the proposed Mark I Containment Performance Program (described in SECY 89-017, January 1989), the Commission directed the staff to pursue Mark I enhancements on a plant-specific basis in order to account for possible unique design differences that may bear on the necessity and nature of specific safety improvements. Accordingly, the Commission concluded that the recommended safety improvements, with one exception, that is, hardened wetwell vent capability, should be evaluated by licensees as part of the Individual Plant Examination (IPE) Program. With regard to the recommended plant improvement dealing with hardened vent capability, the Commission, in recognition of the circumstances and benefits associated with this modification, has directed a different approach. Specifically, the Commission has directed the staff to approve installation of a hardened vent under the provisions of 10 CFR 50.59 for licensees, who on their own initiative, elect to incorporate this plant improvement. The staff previously inspected the design of such a system that was installed by Boston Edison Company at the Pilgrim Nuclear Power Station. The staff found the installed system and the associated Boston Edison Company's analysis acceptable.

A copy of Boston Edison Company's description of the vent modification is enclosed for your information. For the remaining plants, the staff has been directed to initiate plant-specific backfit analyses for each of the Mark I plants to evaluate the efficacy of requiring the installation of hardened wetwell vents. Where the backfit analysis supports imposition of that requirement, the staff is directed to issue orders for modifications to install a reliable hardened vent.

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The staff believes that the available information provides strong incentive for installation of a hardened vent. First, it is recognized that all affected plants have in place emergency procedures directing the operator to vent under certain circumstances (primarily to avoid exceeding the primary containment pressure limit) from the wetwell airspace. Thus, incorporation of a designated capability consistent with the objectives of the emergency procedure guidelines is seen as a logical and prudent plant improvement. Continued reliance on pre-existing capability (non-pressure-bearing vent path) which may jeopardize access to vital plant areas or other equipment is an

unnecessary complication that threatens accident management strategies. Second, implementation of reliable venting capability and procedures can reduce the likelihood of core melt from accident sequences involving loss of long-term decay heat removal by about a factor of 10. Reliable venting capability is also beneficial, depending on plant design and capabilities, in reducing the likelihood of core melt from other accident initiators, for example, station blackout and anticipated transients without scram. As a mitigation measure, a reliable wetwell vent provides assurance of pressure relief through a path with significant scrubbing of fission products and can result in lower releases even for containment failure modes not associated with pressurization (i.e., liner meltthrough). Finally, a reliable hardened wetwell vent allows for consideration of coordinated accident management strategies by providing design capability consistent with safety objectives. For the aforementioned reasons, the staff concludes that a plant modification is highly desirable and a prudent engineering solution of issues surrounding complex and uncertain phenomena. Therefore, the staff strongly encourages licensees to implement requisite design changes, utilizing portions of existing systems to the greatest extent practical, under the provisions of 10 CFR 50.59.

As noted previously, for facilities not electing to voluntarily incorporate design changes, the Commission has directed the staff to perform plant-specific backfit analyses. In an effort to most accurately reflect plant specificity, the staff herein requests that each licensee provide cost estimates for implementation of a hardened vent by pipe replacement, as described in SECY 89-017. In addition, licensees are requested to indicate the incremental cost of installing an ac independent design in comparison to a design relying on availability of ac power. In the absence of such information, the staff will use an estimate of \$750,000. This estimate is based on modification of prevalent existing designs to bypass the standby gas treatment system ducting and includes piping, electrical design changes, and modifications to procedures and training.

The NRC staff requests that each licensee with a Mark I plant provide notification of its plans for addressing resolution of this issue. If the licensee elects to voluntarily proceed with plant modifications, it should be so noted, along with an estimated schedule, and no further information is necessary. Otherwise, the NRC staff requests that the above cost information be provided. In either event, it requests that each licensee respond within 45 days of receipt of this letter.

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This request is covered by Office of Management and Budget Clearance Number 3150-0011, which expires December 31, 1989. The estimated average burden hours are 100 person hours per licensee response, including searching data sources, gathering and analyzing the data, and preparing the required letters. These estimated average burden hours pertain only to the identified response-related matters and do not include the time for actual implementation of the requested actions. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Record and Reports Management Branch, Division of Information Support Services, Office of Information Resources Management, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555; and to the Paperwork Reduction Project (3150-0011), Office of Management and Budget, Washington, D.C. 20503.

If you have any questions regarding this matter, please contact the NRC Lead Project Manager, Mohan Thadani, at (301) 492-1427.

Sincerely,

James G. Partlow
Associate Director for Projects
Office of Nuclear Reactor Regulation

Enclosures:

1. Description of Vent
Modification at the Pilgrim
Nuclear Power Station
2. List of Most Recently

Issued Generic Letters