From: John Boska
To: david.distel@exeloncorp.com
Date: 9/7/05 1:30PM
Subject: RAIs on TMI MC4904 containment hatch

Dave, the previous version of the request for additional information (RAIs) we sent based on the Three Mile Island application on the containment equipment hatch had some format problems. Attached is a WordPerfect file with the proper format. Please use these RAIs as the basis for your response, based on our phone call today. Thanks.

John P. Boska
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CC: Morgan, Nadiyah; Tam, Peter

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Subject:	RAIs on TMI MC4904 containment hatch
Creation Date:	9/7/05 1:30PM
From:	John Boska
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Three Mile Island, Unit 1 (TMI-1)
Amendment Request to Eliminate Containment Equipment Hatch Closure During Refueling
Request for Additional Information, September 7, 2005

1. A value of 5000 cubic feet per minute (cfm) (4000 cfm due to intake flow plus 1000 cfm for inleakage) is assumed for the value of unfiltered inleakage into the control room during the first 30 minutes of the postulated fuel handling accident.

   a. Because the 1000 cfm value for unfiltered inleakage is not based upon a measurement during this mode of operation, justification should be provided to explain why this number is appropriate. Please provide details regarding your control room, design, maintenance and assessments to justify the use of and any plans to verify this number.

   b. Does the 1000 cfm unfiltered inleakage include 10 cfm for ingress and egress into and out of the control room over the duration of the accident?

   c. The supplementary response dated July 29, 2005 states: "For conservatism, the 4000 cfm represents one half of the normal intake flow for the 30-minute period during which the normal HVAC shuts off due to the isolation signal, but before emergency ventilation is started." It also states that: "Several aspects of RMs (Radiation Monitors) can delay the isolation, including the delay for activity to build up to concentrations equivalent to the alarm setpoint and the effects of different radionuclide accident isotopic mixes on monitor response. To eliminate the effects of RM detection delays, the TMI-1 control room is conservatively assumed to be isolated manually by CR (Control Room) operator 30 minutes after the accident." UFSAR Section 9.8.1.1 appears to state that the normal intake flow is at least 4500 cfm. Section 9.8.1.1 states: "This is accomplished by permanently setting the manual balancing dampers in the outside air supply duct (AH-D-605 and AH-D-39) to provide at least 4500 cfm." No value appears to be given for the upper bounding normal flow rate (which typically yields the most limiting doses). The staff requests further clarification of the assumed operation of the control room heating ventilation and air conditioning (HVAC) during the Fuel Handling Accident in Containment.

   d. Justify the statement that the 4000 cfm represents one half of the normal intake flow. Does TMI-1 ever operate with two trains of normal intake operating simultaneously? If so please justify why this is not modeled.

   e. Justify why the 4000 cfm is representative of the operating condition before isolation at 30 minutes. Why wouldn't the normal intake flow be at least 4500 cfm during this 30 minutes or be representative of the potential upper bounding flow rate allowable by the system? If an upper bound is used please provide justification for the upper bounding flow rate.

2. The proposed Technical Specification changes specify that a "designated" crew is available to close the Equipment Hatch opening rather than a "dedicated" crew who would have no other duties. Specify what other duties the designated crew will have and

where they will be stationed relative to the equipment hatch opening.

3. Please provide engineering drawings of the proposed change. A photograph of the equipment hatch would also be helpful in the review of this proposed change. Describe the steps taken to ensure any proposed flashing will not interfere with closure of the Equipment Hatch opening. What is the acceptable design clearance between any proposed flashing on the shield doors and the containment to ensure that the flow after the opening is closed is into containment?

4. Please provide the criterion used to decide if the Equipment Hatch opening is capable of being closed within 45-minutes.

5. General Design Criterion 64 of 10 CFR Part 50, Appendix A, states that means shall be provided for monitoring the reactor containment atmosphere, spaces containing components for recirculation of loss-of-coolant accident fluids, effluent discharge paths, and the plant environs for radioactivity that may be released from normal operations, including anticipated operational occurrences, and from postulated accidents. The proposed change should consider how Criterion 64 will be met in the event of an FHA with the Equipment Hatch open. Please provide the bases for meeting Criterion 64 for the proposed change.

   a. Technical Specification 3.8.9 states that the reactor building purge isolation valves, and associated radiation monitors that initiate purge isolation, shall be tested and verified to be operable no more than 7 days prior to initial fuel movement in the reactor building. Page 3-45a of the proposed technical specification bases changes a description of the requirement to test the purge isolation system. Currently, the bases state that this "test is performed no more than 7 days prior to the start of fuel movement . . . to ensure that the monitors, purge valves, and associated interlocks are functioning prior to operations *that could result in a fuel handling accident within the reactor building.*" The proposed change is to remove the words in italic and replace them with "*when containment integrity is to be maintained.*" Since the proposed amendment to allow the equipment hatch to be open enables containment integrity to not be maintained, it appears that the proposed change to the bases may conflict with Technical Specification 3.8.9. The proposed change to the bases appears to limit the testing of the purge isolation system to ensure it is functioning only prior to operations when containment integrity is to be maintained. Technical Specification 3.8.9 does not limit the testing to when containment integrity is to be maintained. If the intent of the bases change is to decrease the frequency of testing of the system to only when containment integrity is to be maintained, please justify why the purge isolation system will not be tested if it is relied upon to meet General Design Criterion 64.

6. Confirm that the limiting design basis radiological event during refueling when there are core alterations or movement of irradiated fuel inside containment is the Fuel Handling Accident Inside Containment.

7. Page 4 of 6 of the October 20, 2004 submittal states:

   "The contingency temporary hatch cover provides an atmospheric ventilation barrier to

enable ventilation systems to draw the release from a postulated fuel handling accident in the proper direction such that it can be treated and monitored."

The August 17, 2005 supplement proposes to add Insert B to page 3-45 of the bases. Insert B states:

"The Reactor Building purge valve high radiation interlock will be bypassed to ensure continued air flow into the Reactor Building in the event of a Fuel Handling Accident. The Reactor Building Purge Exhaust radiation monitor will be maintained operable. *There are no special requirements to achieve continuous air flow into the Building.*"

and,

"When a temporary equipment hatch cover (e.g. missile shield) is used in place of the equipment hatch, there are *no special requirements for sealing, pressure retention, or complete blocking of the opening for this cover. When the equipment hatch is rolled in place as the method of covering the hatch opening, it need not be bolted to the opening.*"

While continuous air flow into the building is not credited in the analysis, it is considered in the staffs review of this analysis as a defense-in-depth feature. This is consistent with the regulatory guide 1.183, (regulatory guidance in the TMI licensing bases) and TSTF-68 (which is for a penetration similar in size to the Equipment Hatch) as shown in Appendix 1.

In past reviews of amendments requesting to allow the Equipment Hatch to be open during refueling, the NRC has credited replacing the Equipment Hatch (and in one case the Equipment Hatch shield doors with defense-in-depth measures provided within the specification) as defense. The TMI proposed technical specification does not require either method of closure.

The proposed bases have the potential to conflict with the proposed intent of the specification. It allows the possibility of no closure with no assurance or justification that the flow is into the reactor building. The proposed specification and bases appear to conflict with the intent stated on page 4 of 6, October 20, 2004 submittal and cited above.

Explain how the proposed specification and bases provide assurance that the intent of closure as a defense-in-depth measure is accomplished and that the contingency temporary hatch cover provides an atmospheric ventilation barrier to enable ventilation systems to draw the release from a postulated fuel handling accident in the proper direction such that it can be treated and monitored.

Attachment 1
Regulatory Positions and Technical Specification Task Force 68 Reviewers Note

Regulatory Guide 1.183, Appendix B, Regulatory Position 5.3 states:

If the containment is open during fuel handling operations (e.g., personnel air lock or equipment hatch is open),[3] the radioactive material that escapes from the reactor cavity pool to the containment is released to the environment over a 2-hour time period.

Footnote 3:
The staff will generally require that technical specifications allowing such operations include administrative controls to close the airlock, hatch, or open penetrations within 30 minutes. Such administrative controls will generally require that a dedicated individual be present, with necessary equipment available, to restore containment closure should a fuel handling accident occur. Radiological analyses should generally not credit this manual isolation.

TSTF for containment penetration comparable in size to the Equipment Hatch

TSTF-68, Revision 2, Reviewers Note:

The allowance to have containment personnel airlock doors open and penetration flow paths with direct access from the containment atmosphere to the outside atmosphere to be unisolated during fuel movement and CORE ALTERATIONS is based upon (1) confirmatory dose calculations of a fuel handling accident as approved by the NRC staff which indicate acceptable radiological consequences and (2) commitments from the licensee to implement acceptable administrative procedures that ensure in the event of a refueling accident (even though the containment fission product control function is not required to meet acceptable dose consequences) that the open airlock can and will be promptly closed following containment evacuation and that the open penetration(s) can and will be promptly closed. The time to close such penetrations or combination of penetrations shall be include in the confirmatory dose calculations.