Consumers Power

POWERING MICHIGAN'S PROGRESS

Palisades Nuclear Plant: 27780 Blue Star Memorial Highway, Covert, MI 49043

October 7, 1992

Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT - RESPONSE TO NRC QUESTIONS CONCERNING THE MAXIMUM HYPOTHETICAL ACCIDENT (MHA) AND THE PROPOSED REMOVAL OF HYDRAZINE AT THE PALISADES PLANT

Consumers Power Company submitted a revised MHA analysis on April 29, 1992. On June 12, 1992, in regard to a separate issue, a request was submitted to change the Palisades Technical Specifications to allow us to delete hydrazine as a post accident additive to our safety injection and containment spray. As a result of NRC staff reviews on these two separate but related issues, a conference call was held on August 26, 1992.

The NRC staff raised questions concerning the revised MHA analysis. Formal documentation of the responses given during the conference call are enclosed as Attachment A.

In the conference call a discussion occurred concerning the technical specifications change request that will allow us to delete hydrazine as a post accident safety injection and containment spray additive. This discussion satisfied the NRC staff with regard to the technical specifications change request. However, further NRC questions arose concerning how the removal of hydrazine might affect the revised MHA analysis. Responses to these questions are enclosed in Attachment B.

Patrick M. Donnelly
Plant Safety and Licensing Director

CC: Administrator, USNRC, Region III
Resident Inspector, Palisades

130090

A001
1/1

ATTACHMENT A

Consumers Power Company
Palisades Plant
Docket 50-255

RESPONSE TO NRC QUESTIONS RELATING TO THE APRIL 29, 1992 MHA ANALYSIS SUBMITTAL

October 7, 1992

4 Pages

RESPONSE TO NRC QUESTIONS RELATING TO THE
APRIL 29, 1992 MHA ANALYSIS SUBMITTAL

NRC Question 1. *In your MHA analysis submittal (4/29/92), you have assumed no unfiltered leakage of radioactive materials into the control room envelope from areas outside the envelope. Regarding this assumption, provide the following:*

a. *Description of specific modifications planned for supporting the above assumption. Include the modifications that will eliminate areas outside the envelope such as duct work (both internal and external to the envelope), air handling units and dampers.*

b. *Description of the initial and subsequent periodic tests for establishing the initial and continued effectiveness of the modifications in ensuring zero unfiltered leakage into the control room envelope.*

CPCo Response

a. At this time, the modifications to be performed are still in a conceptual stage. The zero unfiltered air leakage into the control room that was assumed in the MHA analysis submittal (April 29, 1992) was used for the purpose of completing the analysis. After the calculational methodology of the MHA analysis submittal is approved, the analysis will be revised to reflect the amount of actual unfiltered air in-leakage that is achieved after the modifications. The modifications will be completed in the 1994 refueling outage.

b. Initial and subsequent periodic testing methods to measure unfiltered air in-leakage to the control room will be engineered along with the modifications and, they also are not known at this time.

NRC Question 2. *Provide a description of the initial and subsequent periodic tests for verifying the assumption that the total maximum leakage of containment sump water into the SIRW tank from all pathways during the recirculation phase of a design basis LOCA will be mo more than 0.1 gpm.*

CPCo Response

As with the unfiltered air in-leakage into the control room, the sump water leak rate into the SIRW Tank may be changed in a revised MHA analysis that would be performed as a result of the 1994 refueling outage modifications. Previously identified leakage paths have been eliminated and/or leak tested using a periodic test procedure that was written. Additional leak paths resulting from unique single failures of equipment are still being evaluated and will be incorporated in the 1994 modifications. Our plans are to

test each leakage path independently with the sum of the resultant leakage less than the leakage accepted by analysis.

NRC Question 3. *Provide details of pH control of containment sump water by usage of TSP baskets (quantity of TSP, its location, and expected time for reaching the desired pH [>7] after the TSP mixing occurs following a RAS).*

CPCo Response To date a feasibility study has been completed to verify that TSP could be used for post-LOCA sump pH control at Palisades. However, no final decisions or design have been completed for a TSP system at Palisades so, therefore, no details of the TSP system exist at this time.

NRC Question 4. *Identify the laboratory test conditions (temperature, humidity, and preconditioning) for the carbon sample from the control room charcoal absorbers. Also, provide the test acceptance criterion you will use for methyl iodide penetration through the representative sample for claiming the assumed 99 percent efficiency for removal of radioiodine in elemental and organic forms, in your LOCA analysis (see Regulatory Guide (RG) 1.52, Table 2).*

CPCo Response Carbon samples from the control room charcoal absorbers are tested to the following test conditions:

	Value	Test Times
Temperature	30°C	60 minutes
Humidity	70%	60 minutes
Pre-Conditioning	30°C; 70% RH	18 hours

Palisades acceptance criteria for methyl iodide penetration is .175% per RG 1.52 criteria. Palisades further requires a more conservative penetration value of only .157% due to charcoal filter residence time.

NRC Question 5. *Justify why the in-place test acceptance criteria for the HEPA filter and the charcoal absorber (Palisades plant TS Table 4.2.3) are much less stringent than the acceptance criteria given in RG 1.52, Positions C.5.c and C.5.d for claiming 99 percent efficiency for removal of all chemical forms of radioiodine in the DBA analysis.*

CPCo Response

Amendment 81 to the Technical Specifications added the control room ventilation requirements for testing the HEPA and charcoal absorber systems. These requirements exist in the Technical Specifications today as they were approved back in 1984.

By letter dated November 19, 1984, and supplemented by letters dated November 21, 1985 and February 28, 1986, Consumers Power Company applied for an amendment to the license which would have modified the requirements for the control room HEPA and charcoal absorber systems to align with the acceptance criteria of R.G. 1.52 positions C.5.c and C.5.d. On January 24, 1989 CPCo requested that the November 19, 1984 amendment request be withdrawn. Along with that request, we indicated that we would incorporate these requirements into the Restructured Technical Specifications and until then the proposed changes would be maintained under administrative controls. The NRC letter dated May 15, 1989 approved our request for withdrawal.

Palisades performs a surveillance test RT-85D,"In-place HEPA and Charcoal Filter Testing Control Room Ventilation", which has acceptance criteria in accordance with RG 1.52.

	Acceptance Criteria
Hepa Filter Mechanical Efficiency	99.95%
Charcoal Filter Efficiency	99.843%

These values are established to verify in-place performance to assure margin exists for accident conditions.

NRC Question 6. *Clarify whether your are taking credit for plate-out or surface deposition and if so what effort such deposition will have on equipment qualification.*

CPCo Response

Credit for plate-out of iodine in the containment building is being taken in the April 29, 1992 MHA analysis submittal. A plate-out, or wall deposition removal coefficient of 1.3 per hour was calculated for elemental iodine in accordance with Standard Review Plan 6.5.2, Revision 2. The wall deposition that is being accounted for in the MHA analysis should have a very small effect on equipment qualification. The wall deposition occurs at a small rate, as shown by the above calculated value. Also, the calculations in the MHA analysis submittal show that the maximum decontamination factor for elemental iodine, as described in SRP 6.5.2, is reached in approximately 12 minutes from the start of the accident. At that time, all removal of elemental iodine is assumed to stop in the MHA analysis. It would also be expected that containment sprays wash much of the plate-out from the walls to the sump. With the sump water acting as a self-shielding

source, the additional iodine activity in the sump would not be expected to contribute much additional dose to equipment near the containment flood level. The dose due to plate-out would also have a limited range due to the saturated steam atmosphere in containment after a large break loss of coolant accident.

ATTACHMENT B

Consumers Power Company
Palisades Plant
Docket 50-255

RESPONSE TO NRC QUESTIONS RELATING TO THE HOW REMOVING HYDRAZINE FROM POST ACCIDENT SAFETY INJECTION AND CONTAINMENT SPRAY MIGHT AFFECT THE REVISED MHA ANALYSIS

October 7, 1992

2 Pages

RESPONSE TO NRC QUESTIONS RELATING TO THE HOW REMOVING HYDRAZINE FROM POST ACCIDENT SAFETY INJECTION AND CONTAINMENT SPRAY MIGHT AFFECT THE REVISED MHA ANALYSIS

NRC Question 1. *How will the hydrazine removal be achieved? Clarify whether this will mean removal of the hydrazine tank and associated piping and valves and dedicated backup nitrogen?*

CPCo Response Initially, the tank will be drained and all associated valves closed and disabled from automatic initiation. The tank and piping will be left in place or removed at a later date.

NRC Question 2. *Discuss the impact of hydrazine removal on the performance of the containment spray system. Include the NPSH consideration. Clarify whether the containment spray system without any hydrazine addition is ever used for any plant operation.*

CPCo Response The removal of hydrazine will not adversely affect the performance of the containment spray system. The containment spray system was originally designed without the hydrazine addition system. The original plant start-up testing was also performed without the hydrazine tank in place. Therefore, the containment spray pumps will still have sufficient NPSH. The containment spray system is not used for any plant operation other than its post accident design function.

NRC Question 3. *Discuss the effect of hydrazine removal on hydrogen generation, environmental qualification of required equipment and stress-corrosion cracking.*

CPCo Response

a) Containment temperature, pressure, and sump solution pH are the three major factors affecting aluminum and zinc corrosion, and hence hydrogen generation. The hydrazine system has no effect on containment temperature and pressure. The addition of hydrazine would have little to no affect on the pH of the containment sump because of the quantity of hydrazine that is added (50 ppm) and also because from a design standpoint hydrazine is not taken credit for when determining how much sodium hydroxide needs to be added to the post accident sump to obtain the required pH. Removal of the hydrazine system will therefore not affect the sump pH control system and hydrogen generation will not be affected.

b) Hydrazine is caustic so removal of the hydrazine system marginally improves the chemical environment that equipment in containment subject to containment sprays is exposed to after a LOCA.

c) Temperature, pH, oxygen and chloride concentrations, stress, and material composition are the major factors affecting stress corrosion cracking of materials. Since removal of the hydrazine system will not affect the sump pH control system, it will not affect stress corrosion cracking.

NRC Question 4. *In your April 29, 1992 submittal relating to revised MHA analysis, you have stated that either TSP baskets in the containment sump or sodium hydroxide addition may be used for long-term pH control of the sump water. However, in the June 12, 1992 submittal relating to hydrazine removal, you refer to sodium hydroxide use only for long-term pH control. Resolve this apparent discrepancy. If you elect to use TSP baskets, state it so and discuss whether the TSP requirements will be impacted by hydrazine removal. Also, discuss whether the sodium hydroxide requirements will be impacted by hydrazine removal, in case the current arrangement is continued.*

CPCo Response The April 29, 1992 submittal relayed that a final decision on long term sump pH control had not been made and that TSP baskets or sodium hydroxide addition were cited as the most probable systems that would eventually be used. The June 12, 1992 submittal relating to hydrazine removal is intended to be acted upon prior to a time when it would be possible to replace the sodium hydroxide system with any other long term pH control system. Therefore, the June 12, 1992 letter justifies the hydrazine removal to existing plant design, which is the sodium hydroxide system.

The calculation that was performed to determine the amount of sodium hydroxide required to adjust the post-LOCA containment sump to a pH between 7 and 8 did not consider the presence of hydrazine from the hydrazine addition system. Also, if Palisades converts to a passive TSP system for pH control, its design will not consider the presence of hydrazine.