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BVY 92-117

United States Nuclear Regulatory Commission
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References: (a) License No. DPR-28 (Docket No. 50-271)
(b) Generic Letter 92-04, "Resolution of the Issues Related to Reactor Vessel Water Level Instrumentation in BWRs Pursuant to 10CFR50.54(f)", dated 8/19/92
(c) BWROG Letter 92/074 to William T. Russell, (USNRC), dated 8/28/92
(d) BWROG Letter 92/072 to William T. Russell, (USNRC), dated 8/12/92
(e) BWROG Letter 92/073 to William T. Russell, dated 8/13/92

**Subject: Response To Generic Letter 92-04**

Dear Sir:

This letter is written in response to Generic Letter 92-04 which requested BWR Licensees to determine the impact of potential water level indication errors due to non-condensable gases on automatic safety system responses, short term and long term operator actions, operator training, and to provide plans and schedules for any necessary corrective actions.

To prepare this response, Vermont Yankee has reviewed the analysis provided by the BWROG in Reference (c) and has performed a plant specific analysis for the Vermont Yankee Nuclear Power Station. The results of our efforts are summarized in this letter.

During the 1987 and 1989 refueling outages, the reactor vessel water level system at the Vermont Yankee Nuclear Power Station was substantially upgraded to include the installation of new condensate pots, reference leg thermocouples, proper geometry of connecting piping and the elimination of Yarway columns. The new system geometry included relocating the condensing chambers to approximately 3 inches above the vessel nozzles on a relatively short insulated steam supply line and reinstallation of the reference leg piping within the drywell to provide a continuous downward slope. The upgrade was designed to maximize steam condensation, to minimize the entrapment of non-condensable gases and to permit free vertical movement of the level system components. Immediately following these modifications and routinely thereafter, the reactor vessel water level system has been monitored to verify satisfactory operation.

Recently, as a result of water level anomalies experienced at other BWR facilities, our staff has reexamined the installation and performance data of the reactor vessel water level system. Based on our reviews of the design change work package, installation drawings and recent system walkdowns, we have concluded that the reactor water level indicating system at Vermont Yankee is installed properly and consistent with industry guidance. Further, based on performance data from the four installed thermocouples, control room recorders, the Vermont Yankee ERFIS computer system and

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discussions with the control room operating staff, we have concluded that the reactor water level indicating system is operating properly.

The Vermont Yankee specific Emergency Operating Procedures (EOP's) and operator training program were also addressed in our analysis. We have concluded that the Vermont Yankee EOP's adequately envelope the potential effects of non-condensable gases and that the control room operators will be appropriately trained to recognize the effects of non-condensable gases in reference legs through "read and sign" and formal classroom training programs.

Our responses to the actions specifically requested in GL 92-04 are as follows:

1. **In light of potential errors resulting from the effects of non-condensable gas, each licensee should determine:**

   a. **The impact of potential level indication errors on automatic safety system response during all licensing basis transients and accidents;**

      It is concluded that at the Vermont Yankee Nuclear Power Station, potential level errors due to non-condensable gases will have no affect on automatic safety system responses during all licensing basis transients and accidents. Non-condensable gas errors associated with post-accident monitoring are enveloped by assuming a 10 inch error for the 77 inch to 177 inch range (RPS/ECCS) and a 20 inch error for the +200 inch to -200 inch range (wide range) instruments.

   b. **The impact of potential level indication errors on operator's short and long term actions during and after all licensing basis accidents and transients;**

      Guidance is being provided to the Vermont Yankee operators to recognize the effects of non-condensable gases in reference legs. There is no additional short term or long term impact on operator action as a result of this issue.

   c. **The impact of potential level indication errors on operator actions prescribed in emergency operating procedures or other affected procedures not covered in (b).**

      The Vermont Yankee EOPs adequately encompass the effects of non-condensable gases. Errors postulated to exist due to these gases are enveloped by existing procedures and training.

2. **Based upon the result of (1), above, each licensee should notify the NRC of short term actions taken, such as:**

   a. **Periodic monitoring of level instrumentation system leakage; and,**

   b. **Implementation of procedures and operator training to assure that potential level errors will not result in improper operator actions.**

      The following actions will be taken to reemphasize the necessity of ensuring highly reliable reactor water level:

      - On a monthly basis, Vermont Yankee will inspect the instrument sensing lines for any leakage around valves and fittings.

- The control room operators will continue to monitor and document any mismatches in the indicated reactor water level.
- The control room operators will continue to monitor reference leg temperatures.
- Vermont Yankee will continue to closely monitor the reactor vessel water level systems during plant shutdowns.
- The Licensed Operator Requalification Training Program is being enhanced to include the potential effects of non-condensable gases coming out of solution in reference legs.

3. **Each licensee should provide its plans and schedule for corrective actions, including any proposed hardware modifications necessary to ensure the level instrumentation system design is of high functional reliability for long term operation. Since the instrumentation plays an important role in plant safety and is required for both normal and accident conditions, the staff recommends that each utility implement its longer term actions to assure a level instrumentation system of high functional reliability at the first opportunity but prior to starting up after the next refueling outage commencing 3 months after the date of this letter.**

Vermont Yankee has concluded that our existing reactor water level system installation at the Vermont Yankee Nuclear Power Station is highly reliable and functioning as designed. No hardware modifications are required or planned at this time. However, due to the importance associated with this issue, Vermont Yankee fully intends to follow industry developments as they continue to evolve.

We believe that this submittal is responsive to your concerns and to the response suggested in References (d) and (e); however, should you have any further questions, please do not hesitate to contact us.

Very truly yours,

Vermont Yankee Nuclear Power Corporation

Warren P. Murphy
Senior Vice President, Operations

cc: USNRC Regional Administrator, Region I
USNRC Resident Inspector, VYNPC
USNRC Project Manager, VYNPC

SALLY A. SANDSTRUM
NOTARY PUBLIC
WINDHAM COUNTY, VERMONT
My Term Expires 2/10/95

STATE OF VERMONT )
)ss
WINDHAM COUNTY )

Then personally appeared before me, Warren P. Murphy, who, being duly sworn, did state that he is Senior Vice President, Operations, of Vermont Yankee Nuclear Power Corporation, that he is duly authorized to execute and file the foregoing document in the name and on the behalf of Vermont Yankee Nuclear Power Corporation, and that the statements therein are true to the best of his knowledge and belief.

Sally A. Sandstrum 9/28/92
Sally A. Sandstrum, Notary Public
My Commission expires February 10, 1995