

September 10, 2007

NRC 2007-0076
10 CFR 50.73

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Point Beach Nuclear Plant, Units 1 and 2
Dockets 50-266 and 50-301
Renewed License Nos. DPR-24 and DPR-27

Licensee Event Report 266/301-2007-006-00
Fire Inspection Analysis of Pressurizer Power-Operated
Relief Valves and Block Valves

Enclosed is Licensee Event Report (LER) 266/301-2007-006-00 for the Point Beach Nuclear Plant, Units 1 and 2. This LER discusses the discovery of possible spurious actuation of a pressurizer power-operated relief valve and damage to the associated block valve circuitry during a postulated fire. This event is reportable in accordance with 10 CFR 50.73(a)(2)(ii)(B) as a "Degraded or Unanalyzed Condition."

This letter contains no new commitments and no revisions to existing commitments.



Dennis L. Koehl
Site Vice-President, Point Beach Nuclear Plant
Nuclear Management Company, LLC

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, Point Beach Nuclear Plant, USNRC
Resident Inspector, Point Beach Nuclear Plant, USNRC
PSCW

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|--|--------|------------------------------------|--|--------------------------------------|-------------------------------|---|-----------|---------------|
| NRC FORM 366 (6-2004) | | U.S. NUCLEAR REGULATORY COMMISSION | | APPROVED BY OMB NO. 3150-0104 | | EXPIRES 6-30-2007 | | |
| LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block) | | | | | | | | |
| Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0066), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection. | | | | | | | | |
| FACILITY NAME (1) Point Beach Nuclear Plant Unit 1 | | | | DOCKET NUMBER (2) 05000266 | | PAGE (3) 1 of 4 | | |
| TITLE (4) FIRE INSPECTION ANALYSIS OF PRESSURIZER POWER-OPERATED RELIEF VALVES AND BLOCK VALVES | | | | | | | | |
| EVENT DATE (5) | | | LER NUMBER (6) | | | REPORT DATE (7) | | |
| MO | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REV NO | MO | DAY | YEAR |
| 07 | 12 | 2007 | 2007 | -- 006 -- | 00 | 09 | 10 | 2007 |
| OPERATING MODE (9) 1 | | | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR ̳: (Check all that apply) (11) | | | | | |
| POWER LEVEL (10) 100 | | | 20.2201(b) | | | 20.2203(a)(3)(ii) <input checked="" type="checkbox"/> | | |
| | | | 20.2201(d) | | | 20.2203(a)(4) | | |
| | | | 20.2203(a)(1) | | | 50.36(c)(1)(i)(A) | | |
| | | | 20.2203(a)(2)(i) | | | 50.36(c)(1)(ii)(A) | | |
| | | | 20.2203(a)(2)(ii) | | | 50.36(c)(2) | | |
| | | | 20.2203(a)(2)(iii) | | | 50.46(a)(3)(ii) | | |
| | | | 20.2203(a)(2)(iv) | | | 50.73(a)(2)(i)(A) | | |
| | | | 20.2203(a)(2)(v) | | | 50.73(a)(2)(i)(B) | | |
| | | | 20.2203(a)(2)(vi) | | | 50.73(a)(2)(i)(C) | | |
| | | | 20.2203(a)(3)(i) | | | 50.73(a)(2)(ii)(A) | | |
| | | | | | | 50.73(a)(2)(v)(B) | | |
| | | | | | | 50.73(a)(2)(v)(C) | | |
| | | | | | | 50.73(a)(2)(v)(D) | | |
| | | | | | | 50.73(a)(2)(vii) | | |
| | | | | | | 50.73(a)(2)(viii)(A) | | |
| | | | | | | 50.73(a)(2)(viii)(B) | | |
| OTHER FACILITIES INVOLVED (8) | | | | | | | | |
| FACILITY NAME Pt Beach Unit 2 | | | | | | DOCKET NUMBER 05000301 | | |
| FACILITY NAME | | | | | | DOCKET NUMBER | | |
| OTHER Specify in Abstract below or in NRC Form 366A | | | | | | | | |
| LICENSEE CONTACT FOR THIS LER (12) | | | | | | | | |
| NAME Felicia Hennessy, Engineering Supervisor | | | | | | TELEPHONE NUMBER (Include Area Code) 920/755-7671 | | |
| COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13) | | | | | | | | |
| CAUSE | SYSTEM | COMPONENT | MANU-FACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANU-FACTURER |
| | | | | | | | | |
| SUPPLEMENTAL REPORT EXPECTED (14) | | | | | EXPECTED SUBMISSION DATE (15) | | MONTH | DAY |
| YES (If yes, complete EXPECTED SUBMISSION DATE). | | | | | X NO | | | |
| ABSTRACT | | | | | | | | |
| <p>During a review of abnormal operating procedure (AOP)-10A, Safe Shutdown-Local Control, it was identified that fire damage to the pressurizer power-operated relief valve (PORV) and block valve circuits as a result of a fire in the cable spreading room could also result in simultaneous damage to a block valve circuit and spurious actuation of a PORV. While the actions included in abnormal operating procedure (AOP-10A), provide reasonable assurance that positive control of reactor coolant system (RCS) inventory is maintained, these steps do not ensure that simultaneous failure of the block valve circuit and spurious operation of a PORV will not result in RCS depressurization. Therefore, a postulated fire may potentially remove the ability to fully implement the Safe Shutdown Strategy. This condition was reported via an 8-hour non-emergency report, EN 43487, on July 12, 2007, pursuant to 10 CFR 50.72(b)(3)(ii)(B), as an unanalyzed condition that had the potential to significantly degrade plant safety. Compensatory measures in the form of twice-per-shift fire rounds in the cable spreading room have been implemented.</p> | | | | | | | | |

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

Event Description:

On July 12, 2007, a review of abnormal operating procedure (AOP)-10A, Safe Shutdown-Local Control identified that fire damage to the pressurizer [PZR] power-operated relief valve (PORV) and block valve circuits as a result of a fire in the cable spreading room could also result in simultaneous damage to a block valve circuit and spurious actuation of a PORV. There are actions in AOP-10A to provide reasonable assurance that positive control of reactor coolant system (RCS) inventory is maintained. However, these steps do not account for a simultaneous failure of the block valve circuit and spurious operation of a PORV before the manual actions are completed in the control room. This postulated chain of events could result in RCS depressurization. An 8-hour non-emergency report, EN 43487, was made on July 12, 2007, pursuant to 10 CFR 50.72(b)(3)(ii)(B), as an unanalyzed condition. This event is not a safety system functional failure.

Event Analysis:

Potential spurious actuations and circuit failures in an area are considered and mitigated, consistent with the priorities established by the functional requirements analysis. The Point Beach Nuclear Plant (PBNP) functional requirements analysis contained in the Fire Protection Evaluation Report (FPER) was performed to evaluate response to fire failures such as the simultaneous, instantaneous fire damage to PORV and block valve circuits for a fire in the cable spreading room or control room. As discussed in FPER Section 5.2.5.3, the magnitude, duration or complexity of a fire cannot be foreseen to the extent that circuit failure timing and quantity can be predicted. Spurious actuations from fire-induced circuit failures were not postulated to occur simultaneously unless the failures are common mode resulting from fire damage to a single related circuit. The functional requirements analysis established limiting timeframes that could result from fire-induced equipment failures and spurious component actuations. These analyses were performed using conservative assumptions based on worst case initial conditions and limited component availability to mitigate the consequences of a fire event. The timeframes that resulted from these analyses and calculations were not considered absolute values for acceptability of operator action or system performance. Instead, these results, in conjunction with considerations on the likelihood of the event, were used to help prioritize the order in which manual operator actions are performed in response to a fire.

In the case of the PORV and block valves, circuit failure has been postulated and evaluated. Actions to close the block valves and initiate containment isolation early are contained in the abnormal operating procedure (AOP)-10A, Safe Shutdown-Local Control. This is followed with removing power to the block valves at their respective motor control center to ensure they remain closed and removing instrument air (IA) from the PORVs to ensure they remain shut. Initiation of containment isolation early in the procedure provides additional assurance that a PORV will not spuriously operate or stay open if operated because this action isolates the IA supply to containment. Therefore, the only available IA would be the residual pressure in the containment IA piping.

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Safety Significance:

This Licensee Event Report (LER) documents a fire event which could result in block valve circuit failure and spurious operation of a PORV prior to establishment of positive control room actions to mitigate the consequences of the fire. The scope of this issue is limited to the ability to achieve and maintain hot safe shutdown in the event of a severe fire. Based on the functional requirements analysis contained in the FPER, mitigation of a potential spurious operation of a PORV is given a high priority in AOP-10A. Thus, actions to ensure closure of the block valves are prioritized. The initiation of containment isolation early in the procedure provides additional assurance that a PORV will not spuriously operate or stay open if operated because this action isolates the IA supply to containment. Therefore, the only available IA would be the residual pressure in the containment IA piping. These failures must also occur prior to, or shortly after, initiation of containment isolation for there to be sufficient residual air pressure in the containment IA piping to open and maintain open a PORV. Some of the cables that can potentially cause the condition described are thermoset-type cables. Although this does not ensure that they will not fail, they generally exhibit better high temperature properties and are less susceptible to failure when compared to thermoplastic-type cables. Based on the above and the analysis of the cable spreading room in the Fire Hazards Analysis Report, the likelihood of a fire that affects these circuits prior to performance of proceduralized mitigative actions is believed to be low. This condition will be evaluated under the NFPA 805 transition project and the safety significance will be determined at that time.

Cause:

PBNP used a probabilistic rather than deterministic approach to the issue of multiple, simultaneous failures. The approach outlined in the FPER states that the magnitude, duration or complexity of a fire cannot be foreseen to the extent of predicting the timing and quantity of circuit failures. However, each potential spurious operation can be addressed and its effects can be individually mitigated. Signals originating from fire-induced circuit failures may occur as a result of a given fire. They are not expected to occur simultaneously unless the spurious operations are caused by the fire-induced failure in circuits that can affect multiple components. As an example, the FPER states that although control circuits for essentially all plant safety systems are routed through the control room, it is not considered credible that the plant must be able to sustain the simultaneous, instantaneous spurious actuation and failure of all these circuits. The spurious opening of a PORV was individually evaluated and actions were developed to mitigate the postulated failure. The first action is to close the respective block valves and shortly thereafter remove power from them. The normally shut PORV's are maintained shut with the additional action of bleeding air from these air-operated valves.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

Corrective Action:

Twice-per-shift fire rounds in the control room and cable spreading room were established as a compensatory measure. Resolution of potential fire effects on PORV and block valve circuitry will be performed by the NFPA 805 Transition Project.

Previous Occurrences:

LER 1999-006-00, "Postulated Fire and Inability to Isolate PORV Outside Appendix R Design Basis," dated August 19, 1999.

Additional Information:

None