

ACCESSION #: 9904070433

NON-PUBLIC?: N

LICENSEE EVENT REPORT (LER)

FACILITY NAME: Kewaunee Nuclear Power Plant PAGE: 1 OF 9

DOCKET NUMBER: 05000305

TITLE: Inadequate Configuration Controls Cause Personnel to
Unknowingly Place Plant in Unanalyzed Condition

EVENT DATE: 02/28/1999 LER #: 1999-001-00 REPORT DATE: 03/30/1999

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 095

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:

50.73(a)(2)(ii)

LICENSEE CONTACT FOR THIS LER:

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Process Leader- Plant Operations

COMPONENT FAILURE DESCRIPTION:

CAUSE: SYSTEM: COMPONENT: MANUFACTURER:

REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On February 28, 1999, with the plant operating at full power, the operating shift crew closed a valve being relied on to provide overpressure protection of a containment penetration. This was contrary to the commitments made regarding Generic Letter (GL) 96-06 concerns with overpressurization of containment penetrations.

Following a timing test failure of redundant containment isolation valves, the crew closed another manual isolation valve in the containment penetration system piping. The crew's action was consistent with guidance provided by the Kewaunee Technical Specifications, when a containment isolation valve is found inoperable. There was a control card hung on the valve which was expected to have precluded this type of event. However, the investigation into the event found that the configuration controls established in response to the GL were ineffective. Accordingly, the Operations staff was not provided with sufficient guidance to ensure continued compliance with the GL concerns.

The plant was in this condition for approximately four hours, from about 0400 to 0800. When the containment isolation valves were retested and declared operable, the valve relied upon to address the GL overpressure concern was reopened. The safety consequences of this event were minimal. The concerns of GL 96-06 are noted to be concerns with overstressing containment penetrations in the event of a high energy line break in containment. At no time was the penetration actually challenged.

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DESCRIPTION OF EVENT

On February 28, 1999, with the plant operating at full power, the operating shift crew closed a valve [V] being relied on to provide overpressure protection of a containment penetration [PEN]. This was contrary to the commitments made regarding Generic Letter (GL) 96-06, "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions, " in particular, the GL concerns with overpressurization of containment penetrations.

Following a timing test failure of redundant containment isolation valves [ISV], the crew closed another manual isolation valve in the containment penetration system piping. The crew's action was consistent with guidance provided by the Kewaunee Technical Specifications, when a containment isolation valve is found inoperable.

On February 28, the operating shift crew performed Surveillance Procedure

(SP) 55-167-5, "Miscellaneous Systems Valve Timing Tests (IST). " Two of the valves included in the SP are RC-507 and RC-508, "Reactor Coolant Drain Tank Discharge Header Isolation Valves." The reactor coolant drain tank (RCDT) is located in the containment building [NH]. The valves are containment penetration isolation valves. RC-507 and 508 are air operated diaphragm valves. When the timing tests were performed, both RC-507 and RC-508 failed to meet their closing time acceptance criteria in that both valves closed faster than what is allowed by procedure. As a result, both valves were declared inoperable.

According to Kewaunee Technical Specifications (TS), containment integrity is defined to exist, in part, when , " [t]he required automatic Containment System isolation valves are OPERABLE or are deactivated in the closed position or at least one valve in each line having an inoperable valve is closed." Subsequent to finding the two valves inoperable, the operating shift ultimately determined that the optimal action to ensure continued TS compliance was to close another valve in the RCDT system discharge piping. Accordingly, the operating shift reviewed applicable drawings and determined that a number of downstream system and interconnecting system isolation valves needed to be closed. Included in the valves identified as needing to

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be closed was CVC-802, "Reactor Coolant Drain Tank Pump Discharge. " This valve provides the system interconnection between the RCDT and the chemical

and volume control system (CVCS)[CB].

As stated earlier, valve CVC-802 must remain open to address the concerns postulated by GL 96-06. When the operators began determining which valves to close to ensure continued TS compliance, they were not aware of the GL requirements for CVC-802. The configuration control established for GL 96-06 on CVC-802 was a "Danger Tag" attached to the valve handwheel. The tag provided information on the valve's status which was intended to provide an operator with information on what to do when faced with having to operate the valve. The tag wording was, "NRC Generic Letter GL 96-06- Valve must remain open when above cold shutdown. Contact E&TS if valve must be closed." In addition, the control room "tagout control sheet" had wording that was identical to the tag with an additional handwritten notation that, "closure could affect overpressure protection." The GL guidance was not discovered until the operator went to close the valve locally.

The efforts of the operating shift included reviews of available GL correspondence to determine why CVC-802 should remain open. They were not able to find any particular reference to CVC-802. They were able to determine, through existing knowledge and/or reviews of available information, the principles behind the GL. However, they were not able to determine why CVC-802 would be relied on to compensate for an overpressure condition since the two containment isolation valves (RC-507 and RC-508) are normally closed valves. What the crew was not able to determine was

the assumptions made for overpressure protection for the penetration in question. For this penetration, the thermal expansion of fluid trapped in the penetration will result in sufficient force to lift the RC valves off their seat against the force of the valves' air actuators.

When faced with the conflicting conditions of the containment integrity Technical Specifications and the GL requirements, the operating crew attempted to determine whether CVC-802 could be closed. The operators decided not to contact outside support for two reasons; the information provided by the tag did not identify

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specifically who in the E&TS (Engineering and Technical Support) organization to contact; and based on their analysis of the situation, they determined the card allowed the valve to be closed. The following were factors involved in making their decisions:

- . The TS containment integrity issue had to be resolved to support continued plant operation.

- . Since the wording on the card stated, "if the valve must be closed," then closing the valve was an acceptable action and appeared to be a consideration when the card was written.

- . Both RC-507 and RC-508 were already closed; therefore, it appeared that closing CVC-802 would not create an overpressure potential condition.

The operating shift's conclusion, based on the information they had available, was that CVC-802 could be closed. They also concluded that the

valve could be closed without prior E&TS notification since the tag did not specifically indicate that the notification should be in advance. Another alternative that the crew decided not to use was to call in an Instrument and Control (I&C) Technician to deactivate RC-507 and RC-508 in the closed position. They also conservatively determined that tagging the inoperable isolation valves would not be acceptable. Consequently, the operating shift closed CVC-802 at approximately 0400.

At approximately 0600 the operating shift was relieved. As part of the shift turnover, the off-going shift informed the on-coming shift of their actions and recommended they contact E&TS. During the turnover, there was discussion between the shifts about the on-coming shift's past experience with a similar valve timing failure on RC-507. The discussion included a previous finding that the technique used in timing the valves could result in a false indication of valve performance. The crews discussed how pausing between valve strokes to allow the valve operator's air supply pressure to stabilize ensures a valid test.

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Subsequent to assuming shift responsibilities, the on-coming shift re-performed the applicable portions of SP 55-167-5 while pausing between the open and closing strokes. Both containment isolation valves performed satisfactorily and were returned to operable status. Shortly thereafter CVC-802 was re-opened.

CAUSE OF THE EVENT

A number of causes have been identified which led up to and resulted in the event. The primary cause was the lack of comprehensive configuration controls to ensure the plant remained in a condition which would assure continued overpressure protection of containment penetration piping. The tag information used to control the position of the valve was incomplete. It did not clearly indicate the nature of the requirement to keep the valve open and did not provide a specific contact in the event the valve needed to be operated. The operators did not have the necessary information to help them understand the basis for the position assumed for CVC-802. In response to GL 96-06 overpressure concerns, Kewaunee staff undertook a number of actions. The actions ranged from long term corrective actions, implementing design changes, to short term actions, determining existing administrative controls would preclude overpressure concerns. There were also instances where engineering analysis determined no actions were necessary. The control for the penetration involved in this event was strictly administrative. That is, CVC-802 was assumed to remain open and the valve was tagged to ensure this was the case. The controls implemented in this case were ineffective.

Contributing factors to this event were:

- 1) There is a lack of guidance for the operator on what actions to take when encountering an inoperable containment isolation valve. The TS for Kewaunee require closure of another valve in the system or deactivating the inoperable valve in the closed position. The guidance to address an

inoperable containment isolation valve is only contained in the TS. The guidance does not include what constitutes deactivation of a valve and how this may be accomplished.

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2) Kewaunee TS provide no explicit limiting condition for operation (LCO) action statements for inoperable containment isolation valves or penetrations. This exacerbated the situation the operators were faced with in that the actions prescribed by TS are accelerated by the actions having to be taken immediately.

3) The initiator of this event was the apparent failure of the containment isolation valves, RC-507 and RC-508, to pass their surveillance test, due to insufficient procedure guidance on waiting between steps of the procedure. The same procedural deficiency led to failure of a timing test on RC-507 during prior performance of the procedure. However, the procedure was not revised to include additional guidance.

Since this was a condition or susceptibility that was previously identified, the cause of this event is partly attributed to failure to implement previously identified corrective action needs. Although the previous event was captured in Kewaunee's corrective action program, no formal corrective actions were proposed. As a result, the earlier informal recommendation to institute procedure changes for the previous event were not followed through.

ANALYSIS OF THE EVENT

This event is conservatively being reported under 10CFR50.73(a)(2)(ii), "any event or condition during operation that resulted in the condition of the nuclear power plant, including its principal safety barriers being seriously degraded." Kewaunee initially reported this event as the plant being in an unanalyzed condition under criterion 10CFR50.72(b)(1)(ii)(A), "a condition which results in the plant being in an unanalyzed condition." The initial report was made within one hour of recognizing the reporting criteria of 10CFR50.72(b)(1)(ii) being challenged.

The penetration that was affected by the actions taken was in the condition for approximately four hours, from about 0400 to 0800. When the containment isolation valves were retested and declared operable, the valve relied upon to address the GL 96-06 overpressure concern was reopened. The safety consequences of this

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event were minimal. The concerns of GL 96-06 are noted to be concerns with over stressing containment penetrations in the event of a high energy line break in containment. At no time was the penetration challenged during the time CVC-802 was closed.

CORRECTIVE ACTIONS The following corrective actions have been taken:

- 1) New "Danger Tags" have been placed with revised wording. The tags now warn of placing the plant in an unanalyzed condition if the valves are closed. Additional guidance was also added to the tag controls sheets which inform the operators of specific staff members who are to be

contacted in the event questions arise or clarifications are needed.

2) A review was conducted of the evaluation for GL issues concerning penetration overpressure concerns. From this review, all the valves that are relied upon to remain open for overpressure protection were compiled. As a result, the tag controls were expanded to include all the GL 96-06 valves. The new tags were placed on all the valves, except for those located inside containment. Of the valves located inside containment, some are not accessible at power. Of the valves located in containment that are accessible at power, it was decided and concurred with by the plant operations review committee (PORC), that hanging these tags could be deferred until the next containment entry due to ALARA concerns. The next scheduled containment entry for routine inspection is on April 7, 1999.

For those valves that are inaccessible at power, the decision was made and concurred with by PORC, not to hang the cards until the next opportunity.

4) The operating procedures were reviewed to determine whether approved procedure guidance conflicted with the GL overpressure concerns. Where conflicts were identified, controls were placed on the procedures to ensure they would not be used until such time as the procedure revisions are completed.

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5) SP 55-167-5 has been revised to provide additional guidance on the timing technique for RC-507 and RC-508.

6) Three additional air operated valves were identified with the

potential for being vulnerable to test failure due to testing technique.

Accordingly, the procedures used to test these valves were also revised.

The following corrective actions are planned:

1) Procedure revisions to correct conflicting procedure guidance and GL

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concerns will be completed.

2) The long term corrective actions to implement design changes or reanalyses of containment penetration will be completed to eliminate the need for administrative configuration controls where practicable.

3) Clarifying guidance will be developed on the TS required actions for containment isolation penetrations and valves. A TS amendment will be submitted to request a change to obtain an LCO action statement.

4) Additional training will be provided to operations personnel on the configuration controls related to GL 96-06. This event report will be used as part of that training.

ADDITIONAL INFORMATION

While investigating the causes of this event, it was determined that similar events have occurred. At least two motor operated valve tests have been performed on other containment isolation valves to satisfy motor operated valve periodic testing requirements. As part of these tests, the motor operated valves were isolated to conduct static diagnostic tests. In both cases, manual isolation valves upstream of the tested valves were closed. An additional motor operated valve has also been found to have been periodically tested which

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resulted in momentarily defeating the GL requirements. The motor operated valve is one included in the Kewaunee inservice test program.

Consequently, the motor operated valve has been cycled closed on a quarterly basis to satisfy the program test requirements.

The two manual and one motor operated valves mentioned above are relied on to be open to address GL 96-06 concerns. The additional occurrences were not reported and will not be reported separately. The cause investigation has revealed that the previous occurrences were the result of ineffective configuration controls. For the earlier events, there were no administrative controls specific to GL 96-06 placed on the valves that were closed. Hence the cause determination of ineffective configuration controls is a common cause to all of the instances where the GL requirements were violated.

The additional examples were discussed with the Kewaunee Senior Resident Inspector. The discussion included Kewaunee's plans not to initiate separate reports of the previous examples but to identify them as part of this event report.

The two containment isolation valves that failed their surveillance test were: ITT Grinnell - Valve Model # 3-DA42R and Actuator Model # WAPDCVSS8R.

SIMILAR EVENTS

Other than those discussed above, no evidence of previous events was noted which would have resulted in previous licensee event reports.

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NRC-99-024

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March 30, 1999 10 CFR 50.73

U.S. Nuclear Regulatory Commission

Attention: Document Control Desk

Washington, D.C. 20555

Ladies/Gentlemen:

Docket 50-305

Operating License DPR-43

Kewaunee Nuclear Power Plant

Reportable Occurrence 1999--001-00

In accordance with the requirements of 10 CFR 50.73, "Licensee Event Report System," the attached Licensee Event Report (LER) for reportable occurrence 1999-001-00 is being submitted.

Sincerely,

Mark L. Marchi

Vice President-Nuclear

GIH

Attach.

cc - INPO Records Center

US NRC Senior Resident Inspector

US NRC, Region III

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