modification was installed to allow the SW piping to the RC pumps to remain open and minimize operator burden during accident or abnormal events. The valves would remain open and would be closed on a low level in the SW surge tank. There was no other stated reason for the modification. It appears that this MAR considered line break as a possible reason for securing the SW valves or the MAR would have left the SW valves open.

This IFI will be left open pending the licensee's inspection of the surge line impingement possibilities and any related reliance on Leak Before Break analysis. The IFI will also be open pending further NRC review of the licensee's stated position that the plant was licensed to Leak Before Break criteria and is not required to consider dynamic LOCA effects from RCS piping.

i. (Open) IFI 95-15-03; Design Requirements for Reactor Coolant Pump Cooler Failure

This IFI remains open pending completion of ongoing NRC review.

j. (Open) IFI 95-15-04; Code Requirement for Thermal Relief Valves on Decay Heat Removal Heat Exchangers

The NRC service water inspection had found that there was no installed relief protection on the Decay Heat Removal Heat Exchangers. Per ASME Section VIII, Division 1, UG-125, 1968 edition, the heat exchangers for the Decay Heat Closed Cooling System are required to have pressure relief devices installed to protect the vessel, irrespective of the size of the vessel, in accordance with the requirements of UG-125 through UG-134.

The inspector read the licensee response that went into much detail on how, by operating procedures and opening of vent and drain valves, the heat exchangers will not be pressurized. The inspector noted that butterfly valves, which typically leak under pressure and are used for isolation, could prevent overpressurization. The inspector felt that the licensee had, in part, presented a reasonable assessment of their interpretation that their current design and practices complied with the Code. However, the licensee did not address certain specific requirements of the Code, i.e. that whenever the valve that isolates the heat exchanger from the relief valve is closed, an authorized person shall remain stationed there and shall again lock or seal the valve in the open position before leaving the station. This IFI remains open pending further NRC review of the licensee's position.

k. (Open) IFI 95-15-05; Relief Valves Removed From Heat Exchangers

Design Change Package MAR 80-04-13-1 was issued to allow the removal of all but one of the relief valves on various sets of heat exchangers in the service water and decay heat systems. This modification was made to address a chronic problem with leakage of these valves. The NRC service water team inspection had cited

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USAS B31.1-1967, Section 122.6.1 which requires that no intervening stop valves shall separate a protected component from its overpressure protection device, and questioned the licensee's position.

During this inspection, the inspectors reviewed the licensee's position stated in their response NED95-0475 dated August 21, 1995. The position shows that there are several sections of the code that allow pressure increases to be averted by taking advantage of other means of overpressure protection. Specifically, paragraph 101.4.2 (Fluid Expansion Effects) tasks the engineer with either designing the system to withstand the increased pressure or providing a means to relieve the excess pressure. The section does not elaborate on methods that may be used to relieve the excess pressure, but it does not restrict the designer to only employing a relief valve as it did in paragraph 102.2.5(b). The licensee emphasized paragraph 102.2.5(a), which states that a relief valve is not required on the low pressure side of a closed valve that isolates a high pressure system from a low pressure system. The inspectors felt that the licensee had, in part, presented a reasonable assessment of their interpretation that their current design and practices complied with the Code. Also, the inspectors noted that leaky relief valves, which were not required for equipment protection, could lead to undesirable gas releases during an accident condition. However, the inspectors noted that the licensee's analysis did not seem to exactly meet the words of paragraph 102.2.5(a) in that the isolation of a heat exchanger in the SW system did not involve isolating a high pressure system from a low pressure system. This IFI remains open pending further NRC review of the licensee's position. A related issue, described in IR 50-302/95-15 paragraph 9 followup below, similarly remains open as part of this IFI.

l. (Closed) IFI 95-15-06; Setpoint for SWS Header Low Pressure

The team was concerned that the setpoint might be too low for starting the service water pumps. The licensee used a simplistic calculation to show that the maximum pressure available without challenging the relief valve setpoint of 100 psig was 105.81 psig. This calculation took into account the difference in elevation between the surge tank level and the pressure switches. A review of the calibration data sheets showed that the calibration was compensated for the difference in height of the switch to the header, thus providing additional margin. Since these switches perform no active accident mitigation function, no further error analysis will be done. The inspector reviewed and concurred with the licensee position. This item is closed.

m. (Closed) IFI 50-302/95-15-07; Placing Check Valve in IST Program

This IFI was opened to follow the licensee's planned addition of check valve SWV-356 to the IST/ISI program. SWV-356 was a boundary valve between the safety-related service water system and the non-safety related industrial cooling system. The inspector

was not completed. A report was reviewed which showed that this was being reviewed for possible change. The inspectors also found instances of problem reports that had been closed out without the action being completed. A review by a licensee team identified these areas and reopened the problem reports.

9.0 Review of System Maintenance and Open Safety-Related Work Requests

The inspectors reviewed a five year history of the work requests on the RW pumps and selected three work requests for review: WR# 0246073 for RWP-2A, WR# 0250375 for RWP-2B, and WR# 0300041 for RWP-3A. These work requests required extensive overhaul to the pumps. The inspectors reviewed the completed procedures associated with the overhaul of the pumps and found that the procedures were detailed enough to accomplish the work. No other major repetitive work was found that would indicate a generic problem with major equipment on the service water system.

The inspectors reviewed the open work requests for the service and raw water systems. One area of concern were the relief valves used for thermal protection of the heat exchangers. The licensee removed the valves from the IST program, and in some cases had removed and capped the opening. In these cases, the relief valve on the parallel cooler is used to protect the other cooler. This requires administrative control to prevent isolating the shutoff valves for the cooler that had the thermal relief valves removed. The removal from the IST program removed the requirement to test the valves. The inspectors felt that this action is not in accordance with Section VIII of the ASME code.

The licensees position is that this is acceptable under the code and can be controlled administratively. This action will be forwarded to NRR for resolution.

The other concern was testing of the accumulators that are used to maintain air operated valves in the correct position. This was to address concerns in Generic Letter 88-14. A review indicated that this work was canceled during an outage. The inspector was shown problem reports that indicated that the licensee had identified this problem.

The inspector reviewed the failure position of these valves and noted that they all failed in the safe position. The licensee needs to categorize the air operated valves to determine if valves that fail in the safe position need to be tested. The inspector also reviewed outage related procedures which tested all ES valves to assure these valves were tested.

The inspectors noted that the higher capacity emergency service water pump was running. This was in order to supply the additional cooling water to the building coolers to maintain the containment temperature. The normal chilled water supply was out of service for extensive maintenance. This also contributed to the decision to wait on using UAF data to clean service water heat exchangers. The present mode of

operation adds significant heat load to the system and consequently increases the delta T across the heat exchangers making the calculation of UAF more reliable. The licensee was exercising the precaution of gathering data for future operations when the normal chiller operation will be supplying cooling to the building coolers. This will result in a lower delta T which could adversely effect UAF calculations.

10.0 Conclusions

Two of the primary objectives of this follow-up inspection were to (1) perform an independent overview evaluation of the service water systems and (2) to evaluate the quality and depth of the licensee's self-assessment. With regard to both of these objectives, the number and nature of the follow-up inspection findings appeared to indicate that significant discrepancies still existed in the areas of design and operation of these systems and that the depth of the licensee's self-assessment was less than adequate, probing little past the pre-defined questions that were provided for the self-assessment team. Additionally, considering some of the answers that were accepted by that team, it appeared that there had been little inclination to challenge plant positions that had been provided without backup documentation or other substantive supporting evidence.

11.0 Exit Interview

The team conducted an exit meeting on July 14, 1995 at the Crystal River 3 Nuclear Power Station to discuss the major areas reviewed during the inspection, the strengths and weaknesses observed, and the inspection results. A list of documents reviewed during this inspection is included as Attachment A of this report. The licensee did not identify any documents or processes as proprietary. There were no dissenting comment at the exit meeting.

Item Number	Status	Description and Reference
IFI 50-302/95-15-01	Open	Design requirement for N_2 over pressure. (paragraph 3.1)
IFI 50-302/95-15-02	Open	Design requirements for Dynamic LOCA effects. (paragraph 3.2)
IFI 50-302/95-15-03	Open	Design requirement Reactor Coolant Pump Cooler failure. (paragraph 3.3)
IFI 50-302/95-15-04	Open	Code Requirement for Relief Valves. (paragraph 3.4)
IFI 50-302/95-15-05	Open	Relief Valves Removed From HX. (paragraph 3.5)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

September 20, 1996

MEMORANDUM TO: Frederick Hebdon, Director
Project Directorate II-3
Division of Reactor Projects I-3, NRR

FROM: Jon R. Johnson, Acting Director
Division of Reactor Projects

SUBJECT: TASK INTERFACE AGREEMENT (TIA 96-014) CRYSTAL RIVER CODE REQUIREMENTS FOR THERMAL RELIEF VALVES ON HEAT EXCHANGERS

An inspection at the Crystal River facility, documented in NRC Inspection Report 50-302/95-21 (portions attached), noted concerns that there were no installed relief protection devices on the Decay Heat Removal Heat Exchangers. This is discussed under IFI 95-15-04 in the attached report.

Another similar concern was that a modification package was issued to allow removal of all but one of the relief valves on various sets of heat exchangers in the service water and decay heat systems. This is discussed under IFI 95-15-05 in the attached report.

The Region requests technical assistance in the evaluation of this issue. This issue may also apply to other plants such as Robinson and Hatch. The inspector believes that the licensee has made a good argument for removal of the relief valves and that current operating procedures will prevent overpressurization. Also, the inspector believes that B&W did no system analysis, but installed relief valves on all heat exchangers for thermal protection only. Another consideration is that the discharge of these valves are not piped to a closed sump which could lead to releases in the auxiliary building during an accident (TMI-2). The reviewers should be aware that this issue has generic implications on other plants that have removed the valves.

Should you have any questions on this matter, please contact C. Casto (404) 331-4182 of our office.

Docket No. 50-302
License No. DPR-72

Attachments: As stated (2)

cc w/atts: L. Raghaven, NRR
R. Cooper, RI
W. Axelson, RIII
J. Dyer, RIV
J. Barnes, RII

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