P21 94249

No: **RI-94-10** # TECHNICAL ISSUE SUMMARY Date: **09/12/94**

IMPROPER CHARGING PUMP HOLD-DOWN BOLT TORQUE

PROBLEM: Vendor technical information concerning hold-down bolt torque values was in error for 2.5 inch RL IJ centrifugal charging pumps supplied by the Pacific Pumps Division of Dresser Industries, Inc. These pumps are used at some Westinghouse plants as charging/safety injection pumps. Excessive torque applied to the hold down bolts can cause pump damage during the recirculation phase of a loss of coolant accident.

ADDITIONAL INFORMATION: During a biannual review of a charging/safety injection pump maintenance procedure, a Duquesne Light Company (DLC) procedure engineer, at the Beaver Valley Nuclear Power Station, discovered a discrepancy in some vendor technical information for the associated pumps. The vendor technical manual text stated that the hold-down bolt torque should be 80 ft-lbs; whereas, the vendor drawing showed that the torque should be 450 ft-lbs. The Beaver Valley pumps associated with this discrepancy were the three charging/high head safety injection pumps at both units. The pumps are 2.5 inch RL IJ eleven stage centrifugal charging pumps supplied by the Pacific Pumps Division of Dresser Industries, Inc.

DLC found that the hold-down bolt torque on their pumps was 450ft-lbs. The vendor was contacted, and stated that the actual torque should be 80ft-lbs as stated in the text of the technical manual. The lower torque value was necessary to allow for thermal expansion of the pump, thereby maintaining critical clearances in the pump during the recirculation phase of a loss of coolant accident. The vendor based the torque value on the thermal expansion which would be experienced during a 268° F transient (the difference between charging water temperature at normal and accident conditions).

DLC reevaluated the expected thermal transient on the charging/high head safety injection pumps during a design basis loss of coolant accident. They found that the pumps would only experience a 100° F transient, vice the original design transient of 268° F. Based on this information, the vendor concluded that hold-down bolt torques for these pumps could remain at 450 ft-lbs. DLC has left the pump hold-down bolts at 450 ft-lbs since lower torque values tend to produce unsatisfactory pump vibration.

EVALUATION: Due to conflicting vendor information, other licensees at Westinghouse plants may find that the hold-down bolts on their charging/high head safety injection pumps are over-torqued. This condition can lead to pump damage during the recirculation phase of a loss of coolant accident. The evaluation performed by the DLC to accept the as-found pump hold-down bolt torques is plant specific. Other licensees who find that they have a similar problem will need to evaluate their actions based on plant specific design features.

LICENSEE ACTION: DLC is still evaluating the root cause of this problem. They are trying to determine what notifications were made to the industry. DLC has information which indicates that they were first aware of the problem in 1979.

NRC ACTION: Region I is forwarding this summary to NRR for a review of generic implications and to Region I resident inspectors for site-specific consideration.

P21 94249
p.2

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