

CONDITION REPORTS (CRs)  
CR 97-3363

STATUS: CLOSED UNIT: 0 SYSTEM: IST INITIATED: 10/15/97 CLOSED: 10/05/98 MSS #:
INITIATOR: BRAD STOCKTON ADMINISTRATOR: KURT RATHGABER ISSUE MANAGER: CRAIG NEUSER
NUMBER OF OPEN ACTIONS : 0 NUMBER OF CLOSED ACTIONS : 2 TOTAL NUMBER OF ACTIONS : 2

IST Program Design Basis For AFW Minimum Flow Recirculation Valves

DESCRIPTION:

The basis for the AFW pump minimum flow recirculation line check valves, AF-0115, -0116, -117, and 1(2)-AF-0114, in the IST Background Document states that they do not have an active safety function to open and the minimum flow lines are not needed since there is always adequate flow to the steam generators under accident conditions. The AFW design basis document, DBD-01, does not discuss the safety functions of these check valves. Typically, these minimum flow line check valves are tested to ensure that they are capable of preventing pump damage during normal operations as well as during accident conditions. The basis for excluding these check valves from the IST Program should provide necessary information and references to support the conclusion that they do not perform an active safety function to open or close. The minimum pump flow rate should be stated along with references to supporting evaluations and NRC Bulletin 88-04 (Potential Safety-Related Pump Loss). Additionally, the bases for the air-operated AFW pump minimum flow recirculation line isolation valves, 1(2)-AF-4002, AF-4007, and -4014, in the IST Background Document and DBD-01, Section 4.8, state that they must open to ensure minimum flow recirculation to prevent pump damage. The IST Program Valve Tables list exercise and stroke time tests of these valves to the open position. This conflicts with the bases for the AFW pump minimum flow recirculation line check valves.

SIGNIFICANCE:

Either the design basis information is incorrect, or required IST is not being performed.

CORRECTIVE ACTIONS COMPLETED OR IN PROGRESS:

A detailed review of the IST Program is in progress. The Background Document is being revised. The IST Program will be revised and submitted to the NRC at the completion of the program review.

RECOMMENDATION:

Design Engineering should evaluate these valves to determine whether or not they perform safety-related functions. The DBD should provide this information. The IST Background Document and the IST Program Valve Tables should be revised such that the safety functions of the minimum flow line check valves and isolation valves are consistent.

STATUS UPDATE:

(10/05/98 KRR) acceptbe

SCREENED BY : CHUCK KRAUSE

REGULATORY REPORTABLE.....(Y/N): N
TS LCO ENTRY .....(Y/N): N
MSS REVIEW REQUIRED .....(Y/N): N

DATE: 10/16/97

TS VIOLATION.....(Y/N): N
OPERABILITY IMPACT PER TS.(Y/N): N
SIGNIFICANCE ..... (A B C D): N

COMMITMENT.....(Y/N): N

10 CFR 21.....(Y/N): N
ACTION .....(A N P R W): N
OPERABILITY DETERMINATION.(Y/N): N

SUPPORTING DETERMINATIONS:

This condition questions the differences in classification of the AFW recirculation check valves as compared to the minimum recirculation isolation valves. This difference needs to be resolved. The IST testing currently does verify current operability of the recirculation lines. The differences in apparent design basis designation needs to be resolved; however, this condition is not now reportable under any of these reporting criteria.

TRENDING INFORMATION:

WHEN : FOURTH QUARTER OF 1997
WHO : Component Engineering
WHY : MINDSET
SKILL BASED ERROR
WHAT : DESIGN VERIFICATION/REVIEW
REGULATORY DOCUMENT - ASME XI RELATED
SYSTEM: INSERVICE TEST EQUIPMENT

NON-OUTAGE
TUNNEL VISION
INADEQUATE ATTENTION TO EMERGING PROBLEMS
INSERVICE INSPECTION PROGRAM
Licensing Basis Discrepancy
AUXILIARY FEEDWATER

Closeout update: Lack of attention to changing standards left us behind. NUTRK search found several similar IST problems which are being programatically addressed by a program upgrade plan.

REFERENCES: LEVEL C
IST PROGRAM

DBD-01
ASME SECTION XI

NRC BULLETIN 88-04

NUREG 1482

ACTION NUMBER 1
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DONE
CREATED : 10/16/97 NEP
WORK DONE: 02/05/98
VERIFIED : 03/14/98
DUE DATE: 01/31/98
CHUCK KRAUSE
GUY JACKS
CRAIG NEUSER

PRIORITY: -100
RECEIVED: 12/29/97 DB
APPROVED: 02/06/98
CLOSED : 03/21/98

EXTENSIONS MADE: 0
VICKIE WALTHER
VICKIE WALTHER
KURT RATHGABER

Handwritten signature: A167

Evaluate the current design basis information for the check valves as compared to the recirculation isolation valves and resolve any apparent differences in the classifications. Provide the resolution of the differences and any changes in classification to the IST Program personnel.

(12/29/97 VAW) The DBD group scope for this item will be limited to the evaluation of the design basis requirements for these valves. Resolution of safety classification issues is the responsibility of OAS and changes to the IST background document are the responsibility of the IST program engineers.

(12/29/97 VAW) Received Action into Group: DB  
Responsible Person: GLJ:GUY JACKS

Due Date: 01/31/98

(01/31/98 GLJ) Requested Due Date: 02/02/98

(02/02/98 VAW) Due Date Change Request Rejected

(02/03/98 GLJ) A comparison between the design basis for the mini-recirc valves and the check valves in the same line has been completed. From a design basis perspective there are no open or closed functions that are safety-related. DBD-01, Rev. 0 does not include these check valves and Rev. 1 will not be adding these valves (non-essential valves).

(02/03/98 GLJ) Passed to VICKIE WALTHER for acceptance of work.

(02/03/98 VAW) Returned to GUY JACKS for additional work.

(02/05/98 GLJ) Additional information is required to explain the DBD group evaluation which concluded that the mini-recirc check valves have no SR functions.

- (1) The functions of the mini-recirc valve may or may not have any implicit or explicit tie to the mini-recirc check valve functions (SR or NSR). In this case there is no tie between the check valve functions and the mini-recirc valve functions.
- (2) The main safety related function for the AF system is to provide water to the steam generators. Therefore, the flow path to the steam generators is the most important path to maintain. The mini-recirc path is a diversion path. Additionally, the AF system was intended to be a "cold start" system. This means that initially warming up pipe or the pump via a recirc path (common practice) is NOT necessary. Lastly, the potential to 'dead head' the pump is a concern. The mini-recirc path is intended to preclude 'dead heading' the pump. However, when the primary AF system function is considered, i.e. provide rated system flow (200 gpm for MD AF pumps and 400 gpm for TD AF pumps @ 1085 psig steam generator pressure), 'dead heading' is not a concern. The MD AF pumps have two safety related (to open) valves in the discharge path to each steam generator. These valves will open enough to preclude any 'dead head' situations. The mini-recirc path is not needed to provide this pump protection. The TD AF pumps have no closed valves in the discharge path (other than check valves), so 'dead heading' is of no concern for these pumps.
- (3) When item (2) above is considered from an AF system functionally perspective, the discussion of SR functions for the mini-recirc check valves can be made. If the mini-recirc check valve should fail closed and stay closed, there is no impact for the SR AF system function to provide water to the steam generators. If the mini-recirc check valve should fail open, then the SR function of the mini-recirc valve to close comes into play. After the appropriate time delay, the mini-recirc valve will close and the AF system discharge path to the steam generators is maintained. The key thought in all of this - when the AF system is initiated, the mini recirc flow path is a diversion path that must be secured in the near term (45 sec time delay currently).
- (4) The other AF system function to consider is the shut down protection function for the pumps on low suction pressure (seismic/tornado event with loss of CST). The mini-recirc path opens to provide cooldown path for the pumps (specifically for the TD pumps). Failure of the mini-recirc check valve by staying in the open position is overridden by the closure of the mini-recirc valve after 45 seconds. Failure of the mini-recirc check valve by closure, will cause the mini-recirc flow path to isolate. This is actual a beneficial result in the seismic/tornado event, in that, more water will go to the steam generators while the pumps are being stopped (less diversion). The down side, lack of pump cooling for the TD AF pumps (not important for MD AF pumps), is not significant, considering that the TD AF pumps will be restarted within 5 minutes on Service Water. The conclusion for the mini-recirc check valves is that there are no active safety related functions. The usual passive function to maintain the AFW system pressure boundary does apply since the valve is part of the AF piping system.
- (5) As an aside, DBD-01, Rev. 0 for AF system has a SR function for the mini-recirc valves to OPEV. DBD-01, Rev. 1 is being revised to reflect that there is no SR function to open. The reliability of having an open discharge flow path after pump start (AF system initiation) to the steam generators is based on SR components in the discharge flow path of the AF system. Pump discharge pressure is high enough to deliver sufficient flow to the steam generators under all SG pressure conditions (up to the relief valve settings) to cool the pump. To dead-head an AFW MD pump after a genuine pump start signal would require either the discharge MOV(s) failing-to-open OR the associated pressure control valve

inadvertently shutting. Either of these failures would constitute the single active failure and would only apply to one pump (not both). If the discharge flow path for the MD pump is blocked by either of these failures, then recirculation is required to protect the pump from destruction. However, if the discharge flow path is blocked, flow to the steam generators would not be possible and the pump flow delivery function is defeated anyway. Since failure of a single AFW pump by this scenario is acceptable under the single failure rules, recirculation flow is not a safety related requirement for MD pump operation.

(02/05/98 GLJ) Passed to VICKIE WALTHER for acceptance of work.

(02/06/98 VAW) Passed to CRAIG NEUSER for Verification.  
Passed to VICKIE WALTHER for acceptance of work.

(03/14/98 CJN) Passed to KURT RATHGABER for Final Close Out.  
The completed work has been reviewed and is acceptable. The findings from this action item will be forwarded to the IST program update team. This action item may be closed.

(03/21/98 KRR) PLA Closure of Item.  
Acceptable. Another action item will be created and assigned to the CG group to follow up on IST program update.

REFERENCES: LEVEL C  
NUREG 1482

ASME SECTION XI  
IST PROGRAM FOR PBNP

DBD-01

NRC BULLETIN 88-04

ACTION NUMBER 2  
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DONE		DUE DATE: 09/30/98	PRIORITY: 3	EXTENSIONS MADE: 1
CREATED : 03/21/98	SEN	KURT RATHGABER	RECEIVED: 03/27/98	CG JIM WILSON
WORK DONE: 10/01/98		CRAIG NEUSER	APPROVED: 10/01/98	JIM WILSON
VERIFIED : 10/02/98		CRAIG NEUSER	CLOSED : 10/05/98	KURT RATHGABER

IST Program Design Basis For AFW Minimum Flow Recirculation Valves. The DBD group has reviewed this issue and made their conclusions. These are provided in the closeout of action item 1. Please update the IST program with this information.

(03/27/98 JAW) Received Action into Group: CG  
Responsible Person: CJN:CRAIG NEUSER Due Date: 04/30/98

(06/03/98 JSH) Set Work Priority to 3. Significance level 3 assigned per NP 5.4.1 Attachment B. Level is based on implementation of programmatic improvements of high safety or regulatory significance.

(06/17/98 TAT) Changed the Due Date from: 04/30/98 to 09/30/98

(10/01/98 CJN) Passed to JIM WILSON for acceptance of work.

(10/01/98 JAW) Passed to CRAIG NEUSER for Verification.  
Based upon the close out documentation of action item 1 of this condition report, the AFW mini-recirc check valves AF-115, 116, 117 and (1)2-AF-114 will not be added to the IST program. However, the mini-recirc flow control valves AF-4007, 4014 and (1)2AF-4002 will remain in the IST program and will be stroke tested from the open to closed position. The IST program document which was issued on 09/30/98 reflects the above testing requirement. Since the mini-recirc flow control valves are already in the program, the required testing is in existing procedures. Therefore, this action item may be closed. No further action is required since all testing requirements are being met.

(10/02/98 CJN) Passed to KURT RATHGABER for Final Close Out.  
This action item may be closed.

(10/05/98 KRR) PLA Closure of Item.  
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REFERENCES: LEVEL C  
IST PROGRAM

DBD-01  
ASME SECTION XI

NRC BULLETIN 88-04

NUREG 1482