

Workorder: 01-000589-000
Status: CD
Entry Date: 01/29/2001 09:49
Planner/Supv: WALTER JUSTICE
Requested By: BRENDA F. SIMRIL 843-8515

***** SUPERVISOR *****

PER Level Rev Level 00
Identified By LINE ORGANIZATION
Self Revealing N

Problem Description Fire Interaction Manual, 0-GO-8, has a generic step in Section 5.0 to isolate non-essential air to containment in the event that letdown isolation valves fail open. The step directs operators to close one of the following valves: 1-FCV-32-110, 2-FCV-32-111, 0-32-718, -724, -725, or -731. PER 00-000072-000 was written during Fire Ops Self-Assessment, SA-OPS-00-01, to document that the above valves were not listed as Appendix R valves in the Fire Safe Shutdown (FSSD) Calculation, SQN-SQS4-0127, or the Fire Hazards Analysis Calculation, SQN-26-D054/EPM-ABB-IMPFA.

The original PER was closed based on the determination that if letdown must be isolated following a fire, closure of either FCV-62-69, FCV-62-70, or all three of the letdown orifice isolation valves (FCV-62-72, -73, -74) would accomplish this function (Ref. Key 7 of SQN-SQS4-127). All five of the System 62 valves are air-operated and can be isolated by closing the subject System 32 valves. The primary means for operating the System 62 valves is via the electrical controls to the valves. The valves are designed to fail closed upon loss of electrical current or control air to the solenoids. Based on this design feature, it was previously determined that isolation of non-essential air to containment was provided as an alternate means for isolating the CVCS letdown line, and was not a required Appendix R strategy. However, upon further review of the FHA calculation, cases have been discovered where isolation of control air has been credited for Appendix R compliance (e.g., FAA-081 and -84 in FHA calc credit control air isolation to justify the fire rated barrier between the two fire areas, and Key 7 of FSSD calc notes that isolation of control air

BBB-6
FA

to containment can be utilized to fail close the
letdown valves for RCS pressure boundary isolation).

Pit Process Equip Y
Potential Oper Issue Y
Potential Reportable N
Potential Degrad/Noncon(91-18)
ASME N
Systems Affected N/A
Systems Affected
Systems Affected
Systems Affected
Units Affected 1&2
Recommendation Process PER
No action, Justify
If Process,PER Level C
If Utilize ACP, No

Immed Action Taken One of the above listed System 32 valves per unit is
required to be closed in order to isolate Control Air.

It appears that FCV-32-110 and -111 cannot be used for
App. R compliance since the associated cabling has not
been analyzed for potential interactions. The 32-718
and -731 valves are located high off of the floor and
are not easily accessible. The 32-724 valves and -725
valves are located in the Unit 1 El. 690 pipe chase and
are equipped with pull chains to allow timely operator
actions. However, emergency lighting is not currently
provided in the area, which is required by the Fire
Protection Report (FPR) for operator actions required
within 8 hours of an Appendix R event. As an
compensatory action until Appendix R emergency lighting
can be installed, an alternate lighting means must be
provided. Hand held lighting units, which are
described as an acceptable backup to 8-hr battery packs
in Part II, Section 14.7 and Part V, Section 2.0 of the
FPR, are available. Procedure O-PI-OPS-000-708.0
maintains operability of portable lanterns credited as
the alternate lighting compensatory measures, which
will ensure their availability. This has been
coordinated with Dave Porter, Operations representative
on the Appendix R team. A standing order will be
issued by Operations which will document the
compensatory action for this condition as well as other
emergency lighting deficiencies. Based on the

availability of backup lighting, it is determined that
this PER does not constitute a plant operability issue.

Recommended Resp Org ENG/MECH
Coordinated With wmjustice
Init Sup-First Last wmjustice
Init Sup Phone 8340
Init Department ENG/MECH
Init Sup Review Date 01/30/2001

***** LEVEL D INFORMATION *****

Lvl D Causing Org
Lvl D Causing Crew
Human Perf Proc Code
Apparent Cause
Lvl D Process/Proced
Hardware Disposition
Technical Justify
Init Supv-First Last
Init Supv Phone
Init Sup Review Date

***** OPS *****

Functional Eval (FE) N
FE Due Date
Affect Operability Y
If Yes,Units/Actions Sequoyah is in FOR 3.7.14 Action "A". We are in
compliance with action "A" by use of the hand held
lighting units.

Offsite OP Review Y
Op Review BFN Y
Op Review BLN
Op Review SQN
Op Review WBN Y
Reportable N
If Yes, List Basis
Ops SRO/STA-Fst Last Loyd Hodges
Ops SRO/STA Rev Date 02/02/2001

***** FE *****

Functional Maint
Potential Degrad/Noncon(91-18)
FE/Eval Due Date
Initial Evaluation
91-18 Degrad Nonconf N
Functional/Eval Basis
Immed/Comp Measures

List Action/Measures

Engineer
Date
Supervisor
Date
OPS SRO/STA-Fst Last
OPS SRO/STA Rev Date
***** MRC *****

Process PER Level C
Interim Action Req'd N
If YES, Specify
RCA Required N
Site Qual Conc/Ver N
Assigned Resp Org ENG/MECH
CA Develop Due Date 03/05/2001
MRC Directions 91-18 Issue
MRC CAP Review N
MRC-First Last Shirley Smith
MRC Review Date 02/02/2001
***** Resp Org *****

CA Develop Due Date 03/05/2001
Section ENG/MECH
POC-First Last
POC Phone
Reactivity Mgt Issue N
A/B-LER N
LER No.
Control of NonConfor N
If Yes, Scope
Hardware Disposition
Disposition RIM/EDMS
Offsite Generic Rev Y
Generic Rev BFN Y
Generic Rev BLN N
Generic Rev Corp N
Generic Rev SQN
Generic Rev WBN Y
Process/Procedures

***** CAUSE DATA *****

Apparent Cause The documentation involved with the Appendix R program at SQN is voluminous and complicated. The Fire Operating Procedure (O-GO-8), Fire Hazards Analysis (SQN-26-D054/EPM-AB-IMPFA), Fire Safe Shutdown

calculation (SQN-SQS4-0127), Appendix R drawing series, and cable block diagrams all contain Appendix R analysis and compliance information that must be used collectively in order to fully interpret all issues and conditions that were used in the original development of the program. Since the program was developed in the mid-80's timeframe, none of the originally involved personnel are still involved in the program. Hence, due to the complexity of the program, assumptions and methodologies are not clearly evident in all instances.

For the subject of this PER, the original evaluation was that either FCV-62-69 or -70, or all three of the letdown orifice isolation valves, could be closed to isolate letdown in an Appendix R event via electric controls, as opposed to isolation of control air. However, upon in-depth review of all Appendix R documentation during self-evaluation processes, it was discovered that revisions of the FHA subsequent to the original development had taken credit for control air isolation in justification of a derated fire barrier, as well as a note in the FSSD calculation that allows isolation of control air to fail close the letdown valves for RCS pressure boundary isolation.

The apparent cause of this PER is that inexperience of personnel combined with the inherent complexity of the program led to notes not being detected that contradicted the basis of the original PER justification.

Root Cause

Causing Org ENG/MECH

Causing Crew

Human Perf Proc Code

HP Perf Second Code

Prev/Similar Event N/A

Specify Search Basis

Extent of Condition

***** PER HUMAN PERF *****

Human Perform Issue: Y

Key Processes: ENG04

Key Processes: ENG07
Event Precursors
Task Demands: COMPLEX INFORM
Individual Capability LACK OF PROFICIEN
Work Environment: CONFUSING PROCED
Human Nature:

Barrier Evaluation: FAILED BARRIER

Error Mode: KNOWLEDGE BASED

Latent Org Weakness: DESIGN/MODIFICA
***** PER CA/RC ITEMS *****

- 1 Action Item Evaluate adequacy of existing Appendix R emergency lighting for operator actions to manually operate VLV-32-724 and -725.
 - 1 Action Type CORRECTIVE ACTION
 - 1 Assigned Org OPS
 - 1 CA Due Date 03/30/2001
 - 1 AO Concur-Fst Last JIM DVORAK
 - 1 AO POC Fst Last DAVE PORTER
 - 1 CA Performed Performed walkdown and determined that existing App. R lighting is NOT adequate.
 - 1 Date Completed 03/13/2001
- 2 Action Item Revise calculation SQN-SQS4-0127 (FSSD Calc) to incorporate manual actions involving VLV-32-724, -725.
 - 2 Action Type CORRECTIVE ACTION
 - 2 Assigned Org ENG/MECH
 - 2 CA Due Date 07/27/2001
 - 2 AO Concur-Fst Last BRENDA SIMRIL
 - 2 AO POC-Fst Last BRENDA SIMRIL
 - 2 CA Performed This action is being closed to Rev. 4 of PER 00-7928 and will be resolved by Corrective Action #14. Also, CA #14 will ensure documentation is revised to address repositioning of one head of Appendix R lighting unit (0-LGT-247-R155).
 - 2 Date Completed 07/23/2001
- 3 Action Item Revise 0-GO-8 to incorporate new manual actions for VLV-32-724, -725.
 - 3 Action Type CORRECTIVE ACTION
 - 3 Assigned Org OPS
 - 3 CA Due Date 07/27/2001
 - 3 AO Concur-Fst Last DAVE PORTER

- 3 AO POC Fst Last DAVE PORTER
- 3 CA Performed Incorporated manual actions in AOP-N.01 App. C, which replaced 0-GO-8.
- 3 Date Completed 07/23/2001
- 4 Action Item Revise Part V of the Fire Protection Report to include VLV-32-724 and -725 as equipment illuminated by the associated emergency lighting unit.
- 4 Action Type CORRECTIVE ACTION
- 4 Assigned Org ENG/MECH
- 4 CA Due Date 07/27/2001
- 4 AO Concur-Fst Last BRENDA SIMRIL
- 4 AO POC-Fst Last BRENDA SIMRIL
- 4 CA Performed This action is being closed to Rev. 4 of PER 00-7928 and will be resolved by Corrective Action #14. Also, CA #14 will ensure documentation is revised to address repositioning of one head of Appendix R lighting unit (0-LGT-247-R155).
- 4 Date Completed 07/27/2001
 - ***** CLOSURE COMMENTS FROM CA *****
 - ***** CAP CONCUR *****

PER Completion Date 07/27/2001
Prep-First Last Brenda Simril
Preparer Date 03/05/2001
Telephone No
(C) Supv-First Last John Thomas
(C) Supv Ext 8224
(C) Supv Date 03/05/2001
(B) DptMgr-Frst Last
(B) DptMgr Date
MRC Reqd N
MRC Concurrence
Reason for N
MRC-First Last
MRC Date
(A) SiteSr-Fst Last
(A) SiteSr Date
(A) PltMgr-Fst Lst
(A) PltMgr Date
React Eng-Fst Lst
React Eng Date
Site Qual Conc Reqd N
Site Qual Concur
Reason for N

Site Qual First Last
Site Qual Date

***** VERIFICATION *****

Final Rev Level 00
Tags Rem-First Last
Tags Date
RO Verify Comp BRENDA SIMRIL
RO Verify Date 07/27/2001
ANI/ANII Required N
ANI/ANII Concurrence
Reason for N
ANI/ANII-First Last
ANI/ANII Date
Site Qual Concur
Reason for N
Site Qual First Last
Site Qual Date
RO Supv Clos-Fst Lst JOHN THOMAS
Closure Date 07/27/2001

***** EXTENSIONS *****

***** REVISIONS *****

***** GENERIC REVIEWS *****

BFN Resp Org ENG/MECHANICAL
BFN Due Date 03/13/2001
BFN Gen Rev Results Information only copies distributed to
Engineering/Design/Mechanical and
Engineering/Design/Electrical
BFN Review-Fst Lst DP WALKER
BFN Review Date 03/13/2001
BLN Resp Org
BLN Due Date
BLN Gen Rev Results
BLN Review-Fst Lst
BLN Review Date
CORP Resp Org
CORP Due Date
CORP Gen Rev Result
CORP Review-Fst Lst
CORP Review Date
SQN Resp Org

• SQN Due Date
• SQN Gen Rev Results
SQN Review-Fst Lst
SQN Review Date
WBN Resp Org ENG/MECH
WBN Due Date 03/05/2001
WBN Gen Rev Results Copy to BG Briody 03/05/01 for information only review.
WBN Review-Fst Lst TERESA WILSON
WBN Review Date 03/05/2001

***** OPERABILITY REVIEWS *****

BFN Notified-Fst Lst
BFN Notified Date
BFN Op Rev Results
BFN Review-Fst Lst
BFN Review Date
SQN Notified-Fst Lst
SQN Notified Date
• SQN Op Rev Results
SQN Review-Fst Lst
SQN Review Date
WBN Notified-Fst Lst DUNCAN BENNETT
WBN Notified Date 02/08/2001
WBN Op Rev Results Isolation of control air was not credited for letdown isolation at WBN. At WBN letdown isolation is via two separate and independent methods. Each Fire Safe Shutdown section of AOI-30.2 directs letdown isolation via HSs in the control room. Also a local FSSD HS has been added (at the Train B entrance to the ACR) to provide dedicated App R circuitry for closure of 1-FCV-62-69. Manipulation of this local FSSD HS is dictated by AOI-30.2 for each case that warrants its use.

Control air isolation is not credited for any Fire Safe Shutdown Function at WBN.

WBN Review-Fst Lst DUNCAN BENNETT
WBN Review Date 02/08/2001

***** TRENDS *****

Program Code FP
Program Code
Program Code

INPO Code FP1
INPO Code
NRC Code
NRC Code
Category PROCESS
Short Term Code
Impact 6.0
Behavior Code
Org / Prog Code
GEMS
Other
CAUSE CODES
B2D Inadequate documentation provisions

Total records selected: 1

*** END OF REPORT ***