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AR Number: 00654270

Linked ARs

Aff Fac:	Braidwood	**AR Type:**	CR	**Status:**	COMPLETE
Aff Unit:	00	**Owed To:**	A8952CAP	**Due Date:**	01/09/2009
Aff System:	AF			**Event Date:**	07/26/2007
CR Level/Class:	4/D			**Disc Date:**	07/26/2007
How Discovered:	H02			**Orig Date:**	07/26/2007

Action Request Details

Subject: AF TUNNEL COVER BOLT EVAL. USES NON-STANDARD SAFETY FACTOR

Description:

Originator: [redacted] Supv Contacted: [redacted]

Condition Description:
IR 653093 was recently written at Byron to address an issue with factors of safety used in the qualification of the bolting associated with support of the AF tunnel covers. Braidwood has reviewed the Byron issue and has concluded that no operability issue exists at Braidwood. However, desired design margins for these CEAs are not met. The following provides additional details associated with the identified issue.

Byron IR # 620080 indicated that the design basis calculation for the AF tunnel opening cover (1/2" checkered plate) did not consider the high energy line break (HELB) peak pressure of 19.7 psi. This issue also applies to Braidwood. Task 04 of that IR required that calculation be revised to consider loads from HELB. While performing that task it was determined that the CEAs (concrete expansion anchors) supporting the cover did not meet the design safety factor of 4. Additionally, the anchors would not meet the operability safety factor of 2 provided in NRC Bulletin 79-02 Revision 2, but the anchors would exceed the ACI (American Concrete Institute) Code required safety factor of 1. This was documented in IR 653093.

IR 653093 discussed an operability safety factor of 2 based on guidance provided in NRC Bulletin 79-02. Premature failures of CEAs utilized in pipe support base plate designs prompted the NRC to issue guidance for factors of safety applicable to CEAs associated with these supports. Note that the CEA failures were the result of cyclic loads on the CEAs, improperly torqued CEAs and base plate designs that were assumed to behave rigidly but were actually flexible.

Subsequent to writing the IR, Byron and Braidwood Engineering discussed the issue and the applicability of the guidance provided in NRC Bulletin 79-02. The anchors in question are not associated with a pipe support. The anchors support a structural member. The only appreciable cyclic loading associated with these anchors is the excitation of the AF tunnel cover plate due to a seismic load. The factor of safety associated with this load case is considerable (much larger than 4). Additionally, the issue of plate flexibility does not apply for the installed angle. It was also determined that the issue with improperly torqued fasteners was not applicable at Braidwood per the response to NRC Bulletin 79-02. Thus, the parameters that were applicable to the pipe support anchors and base plate do not apply to this structural application. Although using a safety

factor of 2 for operability of structural CEAs is conservative, there is currently no industry guidance that requires the use of this safety factor. It is reasonable to use an interaction ratio of 1 (consistent with the guidance provided in ACI 349) when determining operability for structural qualification (i.e., safety factor of 1).

The design basis calculation (5.6.3.9) for the AF tunnel cover support anchors was reviewed to determine the impact of the HELB loading on qualification of the CEAs. Based on the review of design basis documents, concrete expansion anchors are used to fasten angle iron to the wall to support one edge of the AF tunnel covers. Per this design calculation, the minimum calculated safety factor for the CEAs is 1.08. This safety factor is associated with a load case resulting in a 15.8 psi loading on the AF tunnel cover. The HELB load case results in a cover load of 19.7 psi. Thus, the cover loading has increased by approximately 25% over the originally analyzed load. However, there are conservatisms in the method used to calculate bolt loads.

1. The postulated load distribution along the AF tunnel cover edge supported by the angle and CEAs was based on ACI 63 distribution factors considering two-way plate behavior. The load distribution using this approach is extremely conservative in calculating safety factor for the CEAs. The primary conservatism results from assuming that all four sides of the plate are similarly supported. For the installed configuration, three edges of the cover plate are supported by the rigid structural elements and one edge is supported by the angle iron with CEAs. A more realistic load distribution based on the relative stiffness of the supporting element would significantly reduce loads on the angle iron CEAs.

2. An extremely conservative approach has been used in transferring loads from the angle iron to the CEAs by decoupling local applied moment.

3. Based on a review of the installation detail, the anchor spacing used in the design analysis to calculate loads on the CEAs is conservative. The design analysis has reduced the safety factor for the CEAs based on the assumption that one less CEA is installed than required by the design detail.

When taking into account the conservatisms identified above, it is apparent that the CEAs used to support angle for the AF tunnel cover actually have a factor of safety greater than 1 when considering the HELB load case. Thus, although the CEAs do not conform to the administrative limit for safety factors applicable to CEAs (safety factor of 4), operability is supported.

Immediate actions taken:
Discussed this issue with Byron Engineering.

Recommended Actions:
ATIs must be created for the following:
1) Prepare modifications for the AF tunnel cover supports to provide a design safety factor of 4 for the CEAs.
2) Update calculation 5.6.3.9 to include evaluation of the CEAs for HELB loading.

What activities, processes, or procedures were involved?
Extent-of-condition review of Byron IR 653093.

Why did the condition happen?
Unknown. This is a historic issue.

What are the consequences?

AF tunnel covers are operable, since the safety factor for the bolts exceeds 1 when considering the worst case loading condition (HELB pressure); however, it is recommended that the installation be modified to meet required design safety factor (4).

Based on review of calculations for the CEAs, a safety factor greater than 1 exists when considering the effects of a HELB on the qualification of the AF tunnel cover support CEAs and therefore, no operability issues exist.

Were any procedural requirements impacted?
No

Were there any adverse physical conditions?
The AF tunnel covers do not meet required design factor of safety of 4.

List of knowledgeable individuals:
[redacted]

Operable Basis:
These covers are needed for operability of the 1&2AF013A-H valves for containment isolation. As described in this IR there is adequate design to ensure operability however desired design margin is not met.

Reportable Basis:
The AF vavles and system remain operable. Does not meet any reportable requirements of the Exelon Reportability Manual.

Reviewed by: [redacted] 07/26/2007 23:15:04 CDT
Reviewer Comments:
The shift manager requests a formal operability evaluation for this condition.

SOC Reviewed by: [redacted] 07/27/2007 10:20:03 CDT
SOC Comments:
(7/27/07 JLG) ATI created for an Operability Evaluation as requested by the Shift Manager. The recommended actions will be addressed/created in the Op Eval.[redacted]

Assign #: 01					AR #: 00654270
Aff Fac:	Braidwood	**Assign Type:**	TRKG	**Status:**	COMPLETE
Priority:		**Assigned To:**		**Due Date:**	07/31/2007
Schedule Ref:		**Prim Grp:**	ACAPALL	**Orig Due Date:**	
Unit Condition:		**Sec Grp:**			

Assignment Details

Subject/Description: AF TUNNEL COVER BOLT EVAL. USES NON-STANDARD SAFETY FACTOR

Assignment Completion

In Progress Notes:

Completion Notes:

Assign #: 02					AR #: 00654270
Aff Fac:	Braidwood	**Assign Type:**	OPDB	**Status:**	COMPLETE
Priority:		**Assigned To:**	[redacted]	**Due Date:**	07/31/2007
Schedule Ref:		**Prim Grp:**	A8952DER	**Orig Due Date:**	07/31/2007
Unit Condition:		**Sec Grp:**			

Assignment Details

Subject/Description: Perform an Operability Evaluation as requested by the Shi ft

Assignment Completion

In Progress Notes:

1.0 ISSUE IDENTIFICATION:

Title: AF Tunnel Cover Bolt Eval. Uses Non-standard Safety Factor

1.1 IR #: 654270

1.2 OpEval #: 07-007 Revision: 0

General Information:

1.3 Affected Station(s): Braidwood

1.4 Unit(s): 1 and 2

1.5 System: AF

1.6 Component(s) Affected: Unit 1 and 2 Aux. Feed Tunnel Flood Seals.

1.7 Detailed description of what SSC is degraded or the nonconforming condition, by what means and when first discovered, and extent of condition for all similarly affected SSCs:

The design analysis (calculation 5.6.3.9) for evaluation of the Auxiliary Feedwater Tunnel flood seal covers did not include the effects of a High Energy Line Break (HELB) on qualification of the covers and supporting elements. Additionally, the design analysis uses a non-standard factor of safety for qualification of the concrete expansion anchors (CEA's) used to support the covers. This condition was initially identified at Byron (IR's 653093 and 620080) and was found to be applicable to Braidwood (IR 654270). This condition affects the qualification of the following covers: 1AFFSO1-6, 1AFFSO1-7, 1AFFSO1-8, 1AFFSO1-9, 2AFFSO1-6, 2AFFSO1-7, 2AFFSO1-8 and 2AFFSO1-9.

2.0 EVALUATION:

2.1 Describe the safety function(s) or safety support function(s) of the SSC. As a minimum the following should be addressed, as applicable, in describing the SSC safety or safety support function(s):

- Does the SSC receive/initiate an RPS or ESF actuation signal?

- Is the SSC in the main flow path of an ECCS or support system?

- Is the SSC used to:

- Maintain reactor coolant pressure boundary integrity?

- Shutdown the reactor?

- Maintain the reactor in a safe shutdown condition?

- Prevent or mitigate the consequences of an accident that could result in offsite exposures comparable to 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11 guidelines, as applicable.

- Does the SSC provide required support (i.e., cooling, lubrication, etc.) to a TS required SSC?

- Is the SSC used to provide isolation between safety trains, or between safety and non-safety ties?

- Is the SSC required to be operated manually to mitigate a design basis event?

- Have all safety functions described in TS been included?

- Have all safety functions of the SSC required during normal operation and potential accident conditions been included?

- Is the SSC used to assess conditions for Emergency Action Levels (EALs)?

There are two AF tunnel covers in each Main Steam Isolation Valve (MSIV) room. The covers provide a flood barrier and a HELB barrier between the MSIV room and AF tunnel. The barrier protects the AF013 valves from the effects of flooding or a HELB in the MSIV rooms. The AF013 valves are maintained in the open position. If exposed to a harsh environment, these valves may not be able to close to provide their containment isolation function.

2.2 Describe the following, as applicable:
(a) the effect of the degraded or nonconforming condition on the SSC safety function(s);
(b) any requirements or commitments established for the SSC and any challenges to these;
(c) the circumstances of the degraded/nonconforming condition, including the possible failure mechanism(s);
(d) whether the potential failure is time dependent and whether the condition will continue to degrade and/or will the potential consequences increase; and
(e) the aggregate effect of the degraded or nonconforming condition in light of other open Op. Evals:

(a) The covers are designed to perform a sealing function (leak-tight) between the MSIV rooms and AF tunnel for all design loads including seismic. Based on the design analysis (calculation 5.6.3.9), the CEA's for the AF tunnel cover support members do not meet the structural design criteria requirements with respect to safety factor. The design criteria require a factor of safety of 4 while the design analysis uses a factor of safety of 1. The effect of this condition is that the design margin for

the CEA's is reduced. Additionally, the design analysis does not address the loading on the cover and support members due to a high energy line break. Failure of the cover or supporting members could expose the AF013 valves (located in the AF tunnel) to a harsh environment, which could adversely impact their containment isolation function.

(b) The AF tunnel covers are required to remain intact and in place to ensure that the AF013 valves are protected against the environments due to flooding and HELB within the MSIV rooms. Additionally, the structural design criteria require a factor of safety of 4 to be maintained for CEA's.

(c) The possible failure mechanisms associated with this condition are a catastrophic failure of the plate or supporting member, or the plastic deformation of the cover or supporting member. Either of these scenarios could expose the AF013 valves to an environment for which the AF013 valves have not been qualified.

(d) The AF tunnel covers and associated support components have been qualified independently for the worst case HELB and the worst case flood in the MSIV room. Since worst-case conditions are used, the potential failure is not time-dependant. Additionally the potential consequences will not change over time since worst-case conditions were used.

(e) There are currently eight other open OpEvals at Braidwood. None are associated with the AF tunnel covers. Thus, this non-conforming condition has no impact on the previously evaluated degraded conditions associated with the open OpEvals.

2.3 Is SSC operability supported? Explain basis (e.g., analysis, test, operating experience, engineering judgment, etc.): Yes

The design analysis (calculation 5.6.3.9) for the AF tunnel cover and supporting members was reviewed to determine the impact of the HELB loading on qualification of the CEA's. Per this design analysis, the minimum calculated safety factor for the CEA's is 1.08 (associated with a loading of 15.8 psi). All other components have a factor of safety of at least 1.25.

The HELB load case results in a cover load of 19.7 psi. Thus, the cover loading has increased by approximately 25% (19.7 psi / 15.8 psi) over the originally analyzed load. Since all other components associated with the AF tunnel cover and supporting components have at least a factor of safety of 1.25, only the CEA's require further evaluation for acceptability for the HELB loading.

OP-AA-108-115 discusses an operability safety factor of 2 for concrete anchor bolts associated with pipe supports. The safety factor is based on guidance provided in NRC Bulletin 79-02, "Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts". Premature failures of CEAs utilized in pipe support base plate designs in the 1970's prompted the NRC to issue guidance for factors of safety applicable to CEAs associated with these supports. Note that the CEA failures were the result of cyclic loads on the CEAs, improperly torqued CEAs and base plate designs that were assumed to behave rigidly but were actually flexible.

The anchors in question are not associated with a pipe support. The

anchors support a structural member. The only appreciable cyclic loading associated with these anchors is the excitation of the AF tunnel cover plate due to a seismic load. The factor of safety associated with this load case is considerable (much larger than 4). Additionally, the issue of plate flexibility does not apply for the installed angle. It was also determined that the issue with improperly torqued fasteners was not applicable at Braidwood per the station response to NRC Bulletin 79-02. Thus, the parameters that were applicable to the pipe support anchors and base plate do not apply to this structural application. Although using a safety factor of 2 for operability of structural CEAs is conservative, there is currently no industry guidance that requires the use of this safety factor. It is reasonable to use an interaction ratio of 1, consistent with the guidance provided in ACI 349 (American Concrete Institute) when determining operability for structural qualification (i.e., safety factor of 1)

The design analysis of the CEA's was reviewed to identify whether any conservatisms exist. Based on this review, the following was identified:

1) The postulated load distribution along the AF tunnel cover edge supported by the angle and CEAs was based on ACI 63 distribution factors considering two-way plate behavior. The load distribution using this approach is extremely conservative in calculating safety factor for the CEAs. The primary conservatism results from assuming that all four sides of the plate are similarly supported. For the installed configuration, three edges of the cover plate are supported by the rigid structural elements and one edge is supported by the angle iron with CEAs. A more realistic load distribution based on the relative stiffness of the supporting element would significantly reduce loads on the angle iron CEAs.
2) An extremely conservative approach has been used in transferring loads from the angle iron to the CEAs by decoupling local applied moment.
3) The load resulting from a HELB on the angle is currently (in the design analysis) assumed to act at the hold-down bolt location. Since the load acts downward, the load can be applied at the midpoint of the angle's bearing surface. Additionally, the actual concrete strength could be used to reduce conservatism.
4) Based on a review of the installation detail, the anchor spacing used in the design analysis to calculate loads on the CEAs is conservative. The design analysis has reduced the safety factor for the CEAs based on the assumption that one less CEA is installed than required by the design detail.

When taking into account the conservatisms identified above, it is apparent that the CEAs used to support angle for the AF tunnel cover would actually have a factor of safety greater than 1 when considering the HELB load case. Thus, although the CEAs do not conform to the administrative limit for safety factors applicable to CEAs (safety factor of 4), operability is supported. However, the design margin has been reduced.

If 2.3 = NO, notify Operations Shift Management immediately.
If 2.3 = YES, clearly document the basis for the determination.

2.4 Are compensatory and/or corrective actions required? YES

There are no required compensatory actions. See Section 3.0 for required corrective actions. These actions are required in order to ensure compliance with the structural design criteria.

If 2.4 = YES, complete section 3.0 (if NO, N/A section 3.0).

2.5 Reference Documents:

2.5.1 Technical Specifications and Bases Section(s):
3.7.5 Aux. Feedwater System

2.5.2 UFSAR Section(s):
3.0 Design of Structures, Components, Equipment, and Systems
3.6 Protection Against Dynamic Effects Associated with the Postulated Break of Piping
Attach. C3.6 Main Steamline Break in Main Steam Tunnel
3.11 Environmental Design of Mechanical and Electrical Equipment
15.1.5 Steam System Piping Break at Zero Power
15.1.6 Steam System Piping Break at Full Power

2.5.3 Other:
Dwg S-895, Rev AD
Dwg S-896, Rev. W
Dwg S-969 Rev. AF
Dwg S-970, Rev AB
Dwg S-1062, Rev. X
Dwg S-1088, Rev. N
Dwg S-1093, Rev. U
Dwg S-1502, Rev. G
Calc. 5.6.3, Rev. 005
Calc. 5.6.3-BRW-96-608, Rev. 001
Calc. 3C8-0282-001, Rev. 003

3.0 ACTION ITEM LIST:
If, through evaluating SSC operability, it is determined that the degraded or nonconforming SSC does not prevent accomplishment of the specified safety function(s) in the TS and the intention is to continue operating the plant in that condition, then record below, as appropriate, any required compensatory actions to support operability and/or corrective actions required to restore full qualification. For corrective actions, document when the actions should be completed (e.g., immediate, within next 13 week period, next outage, etc.) and the basis for timeliness of the action. Corrective action timeframes longer than the next refueling outage are to be explicitly justified as part of the OpEval or deficiency tracking documentation being used to perform the corrective action.

Corrective Action #1: Determine scope and extent of change (modification), Get installation estimate. Feed this info to WC for their ATI.
Responsible Dept./Supv.: DEM
Action Due: 08/30/2007
Basis for timeliness of action: There is no time-dependent degradation concern with this issue. The due date is a reasonable amount of time.
Action Tracking #: 654270-03

Corrective Action #2: Determine installation completion date and generate appropriate corrective actions.
Responsible Dept./Supv.: Work Control

Action Due: 09/12/2007
Basis for timeliness of action: There is no time-dependent degradation concern with this issue. The due date is a reasonable amount of time.
Action Tracking #: 654270-04

Corrective Action #3: Install a design change on the Unit 1 AF tunnel covers to restore full design margin
Responsible Dept./Supv.: MMD
Action Due: 05/30/2008
Basis for timeliness of action: There is no time-dependent degradation concern with this issue. The due date is a reasonable amount of time.
Action Tracking #: 654270-05

Corrective Action #4: Install a design change on the Unit 2 AF tunnel covers to restore full design margin
Responsible Dept./Supv.: MMD
Action Due: 05/30/2008
Basis for timeliness of action: There is no time-dependent degradation concern with this issue. The due date is a reasonable amount of time.
Action Tracking #: 654270-06

4.0 SIGNATURES:

4.1 Preparer(s) [redacted] / Date 07/31/07

[redacted] / Date 07/31/07

4.2 Reviewer [redacted] / Date 07/31/07

3rd Party [redacted] / Date 07-31-07
Review

4.3 Sr. Manager Design Engg/Designee Concurrence [redacted] Date 07/31/07

4.4 Operations Shift Management Approval [redacted] Date 07-31-07

4.5 Ensure the completed form is forwarded to the OEPM for processing and Action Tracking entry as appropriate.

5.0 OPERABILITY EVALUATION CLOSURE:

5.1 Corrective actions are complete, as necessary, and the OpEval is ready for closure

/ Date
(OEPM)

5.2 Operations Shift Management Approval / Date

5.3 Ensure the completed form is forwarded to the OEPM for processing, Action Tracking entry, and cancellation of any open compensatory actions, as appropriate.

Completion Notes: OpEval 07-007 has been approved. See in-progress notes for a copy of the text.

Assign #: 03					**AR #: 00654270**
Aff Fac:	Braidwood	**Assign Type:**	CA	**Status:**	COMPLETE
Priority:		**Assigned To:**	[redacted]	**Due Date:**	01/30/2008
Schedule Ref:		**Prim Grp:**	A8952MECH	**Orig Due Date:**	08/30/2007
Unit Condition:		**Sec Grp:**			

Assignment Details

Subject/Description: CA1: OpEval 07-007 - AF tunnel cover bolting Determine scope and extent of change (modification); get installation estimate; provide information to Work Control to support ATI 654270-04. ATI reopened for clarifiaction.

Assignment Completion

In Progress Notes:

*
****COMPLETE FOLLOWING STEPS PRIOR TO COMPLETION OF ASSIGNMENT****

1. Prior to start of work on the completion of any CA, ensure you have reviewed the associated CR, investigation, this assignment, and if necessary contact the originator to ensure a complete understanding of the requested action.
2. Implement the requested actions. (e.g. Procedure should be implemented not submitted for change)
3. Document completion of action by completing each field in the following form or marking NA.
4. Additional guidance is provided by clicking here .
Clicking Here

Record of Extensions: (Note: Record the date, justification and approval received for each extension)

N/A.

Document Corrective Action: (Note: Restate the requested action)
ATI 654270-03:
Determine scope and extent of change (modification); get installation estimate; provide information to Work Control to support ATI 654270-04 and process the design change through the PHC-Sub Committee for approval and prioritization.

Document the Resolution: (Note: Clearly document the implementation of the Corrective Action to the requirements of LS-AA-125 Attachment 3. "That which is not documented is not done.")

- The scope and extent of change (modification) is to install a supporting frame below the AF hatch cover plate.
- The scope of this modification was processed through the PHC-sub as an emergent issue in support of OP EVAL #07-007 with Rank of 12.
- EC 369245 (Unit 1) and EC 369246 (Unit 2) were initiated to provide the required design change. Due date to issue the two EC's is 3/28/2008.
- Installation estimates were provided by MMD and Shaw Group (separately) as follows:

***Note that the frame members are to be pre-fabricated outside. The estimate below does not include pre-fabrication time. The estimate below

does not include the optional new aluminum plate (lighter weight in support of maintenance activities).
- MMD estimates time duration of 84 hrs. (for a crew of 3, total of 252 man-hrs) per opening to install the frame. The number of days depends on the available shifts per day.

- Shaw Group estimates 9-day (work window, no overtime) per opening (crew size not specified).
- Shaw Group estimates cost of 40K per opening to install the frame. The range of cost provided is a wide range depending on how many opening will be installed at the same time (with the same de-mobilization), and how much field adjustments will be required.

- The information was communicated to W/C ([redacted] in-person and to [redacted] by e-mail since he is not available on-site at the time of completion of this ATI). The conceptual design sketches attached below for information only (1 frame for each opening; 8 frames total for both Units).

Document any changes to the intent of the original Actions (Include appropriate Department Head Approval): (Note: Document any deviation from the specific action and document the name of the Senior Manager/Director that authorized the deviation)

N/A.

Document additional assignment determined during evaluation: (Note(s): Do not close to a promise - CA Type Assignments can only be closed to another CA Type Assignment on a CR)

N/A.

Quality Signoff: (Note: Document the name of the person who is accountable for the completion of this assignment.)

Name: [redacted] 1-30-2008

Document Additional Details here:

None

========== Previous Update ==========
(9/11/07 [redacted]) This ATI was reopened and extended to 11/30/07 per BR-40 paperwork approved by [redacted] (reference IR 668649:
The actions required per the assignment referenced could not be procedurally completed as scheduled. Station procedures for design changes required PHC and possibly PRC approval prior to inclusion on the top 40 list and initiation of the subsequent design preparation activities. Although the scope and extent of the design change had been identified as requested in the previous response, no installation cost estimate, installation man-hour estimate, nor installation completion date

was provided since the actual new design had not yet been developed. The intent was to take the request through the design process and to investigate the best practical design resolution possible, such as the previously noted potential application of pre-engineered, hydraulic assisted hatch covers in lieu of just making the existing cumbersome hatch

plates thicker, (although initially more expensive, no MMD support would

be required in the future to remove heavy hatch plates for access). Therefore, the necessary BR-40 paperwork to reopen/reschedule this issue has been developed.
Engineering has also reviewed this issue for potential impact on the OP EVAL #07-007 and has determined that the arguments used to support operability
are unaffected by the date change. However, Op EVAL #07-007 will need to be revised to reflect the new schedule dates. Also, all subsequent action previously linked to this action, i.e. ATI #654270-04, will also need to be changes to reflect the new schedule of events.)
(12/14/07 [redacted])
The intent of this CA has been revised to provide clarity of actions and to process the resolution through applicable Station procedures. The revised actions are for Design Engineering to "determine the scope and extent of change (modification), get installation estimates, and present the design change to the PHC-Sub Committee for approval and prioritization. This change does not impact OP EVAL #07-007 arguments used to support operability. The subsequent action previously linked to this action, i.e. ATI #654270-04, will need to be changed to reflect the new intended actions and schedule dates. These changes have been discussed and accepted by Senior Engineering Management ([redacted]).
New completion date 1/30/2008 based on this approved change of intent.
*
Although the existing hatch was determined to be structurally acceptable, Engineering is investigating a complete redesign of the Aux Tunnel hatch to improve the capacity of the cover and to improve the process for opening/removing the cover when access into the tunnel is required. Engineering is researching pre-engineered hatch covers, (such as Bilco products), for applicability to these locations. As stated above, this design change for the replacement of the hatch will need to be processed through the PHC/PRC Station procedures for approvals. The formal presentation of an alternate design to the PHC-Sub Committee has been scheduled for January 23, 2008. The scope and extent of the design change will be presented along with a preliminary estimated installation cost, an installation man-hour estimate, and a recommended installation date. The design change request will be routed through the design process to ensure the best practical design resolution is provided. As previously noted, potential application of pre-engineered, hydraulic assisted hatch covers, in lieu of just making the existing cumbersome hatch plates thicker, will be considered in this process.
*
Upon completion of this ATI, generate additional actions as required to track through installation and close-out of OP EVAL.

Conceptual design sketches.
AF tunnel flood seal cover plate support frame:

Completion Notes: See the In-Progress Notes for compÝletion details. Additional actions are required. see In-Progress Notes for details.

Assign #: 04					AR #: 00654270
Aff Fac:	Braidwood	**Assign Type:**	CA	**Status:**	COMPLETE
Priority:		**Assigned To:**	[redacted]	**Due Date:**	02/15/2008
Schedule Ref:		**Prim Grp:**	A8940WC	**Orig Due Date:**	09/12/2007
Unit Condition:		**Sec Grp:**			

Assignment Details

Subject/Description: CA2: OpEval 07-007 - AF tunnel cover bolting Determine installation completion date and generate appropriate corrective actions.

Assignment Completion

In Progress Notes:

****COMPLETE FOLLOWING STEPS PRIOR TO COMPLETION OF ASSIGNMENT****
1. Prior to start of work on the completion of any CA, ensure you have reviewed the associated CR, investigation, this assignment, and if necessary contact the originator to ensure a complete understanding of the requested action.
2. Implement the requested actions. (e.g. Procedure should be implemented not submitted for change)
3. Document completion of action by completing each field in the following form or marking NA.
4. Additional guidance is provided by:
Clicking Here

Record of Extensions

The intent of this action has been revised due to the change in intent of the previous action
(-03) change of scope. The new action required for this assignment will be to provide an installation schedule to reflect the Design Change approval dates. New completion date 02/15/2008.

(9/11/07 JLG) This ATI was extended to 12/14/07 as approved by [redacted] on a BR-40 form. (ref: IR668649).

Note: Record the date, justification and approval received for each extension

Document Corrective Action and the Resolution:

Action: provide an installation schedule to reflect the Design Change approval dates.

Resolution:

For U-1, EC 369245 was generated. WOs 1101309, 1101310, 1101311, 1101312 were generated from the EC to install the modification. Based on the scope and estimated duration, and the need to enter a 72 hour LCO when the AF tunnel hatches are not installed, it was determined that this work needs to be performed in an outage. The WO tasks were therefore coded for A1R14. Engineering ([redacted]) has been notified that the Operability Evaluation for the currently installed hatches will need to be reviewed against this schedule. Engineering ([redacted]) has been notified that the

A1R14 scope freeze date has passed and the appropriate actions will be needed per the outage scope process.

For U-2, EC 369246 was generated. WOs 1101325, 1101326, 1101329, 1101331 were generated from the EC to install the modification. Based on the scope and estimated duration, and the need to enter a 72 hour LCO when the AF tunnel hatches are not installed, it was determined that this work needs to be performed in an outage. The WO tasks were therefore coded for A2R13. Engineering ([redacted]) has been notified that the A2R13 scope freeze date has passed and the appropriate actions will be needed per the outage scope process

Note: Restate the requested action and clearly document the implementation of the Corrective Action to the requirements of LS-AA-125 Attachment 3. "That which is not documented is not done."

Document any changes to the intent of the original Actions (Include appropriate Department Head Approval):

See "Record of Extensions" above.

Note: Document any deviation from the specific action and document the name of the Senior Manager/Director that authorized the deviation.

Document additional assignment determined during evaluation:

None

Note: Do not close to a promise -CA Type Assignments can only be closed to another CA Type Assignment on a CR.

Quality Signoff: Name: [redacted] Date: 02/15/2008

Note: Document the name of the person who is accountable for the completion of this assignment
DOCUMENT ADDITIONAL DETAILS HERE:

Completion Notes: See in-progress notes.

Assign #: 05 **AR #: 00654270**

Aff Fac:	Braidwood	**Assign Type:**	CA	**Status:**	COMPLETE
Priority:		**Assigned To:**	[redacted]	**Due Date:**	01/09/2009
Schedule Ref:	A1R14	**Prim Grp:**	A8922MM	**Orig Due Date:**	05/30/2008
Unit Condition:		**Sec Grp:**			

Assignment Details

Subject/Description: CA3: OpEval 07-007 - AF tunnel cover bolting Install design change on the Unit 1 AF tunnel covers to restore full design margin. (12/29/08 [redacted]) Due date moved to 1/9/09. Completed BR-40 paperwork on file. Reason for teh extension is manpower availability due to emergent plant issues. There are no extension impacts.

Assignment Completion

In Progress Notes: Changed the owner of this item to MMD. ([redacted] 08/28/2007)

5/30/08 (DAB) Changed due date to 12/31/08 consistent with Revision 2 to Operability Evaluation 07-007. BR-40 signed by [redacted] for both MMD and WC.

****COMPLETE FOLLOWING STEPS PRIOR TO COMPLETION OF ASSIGNMENT****

1. Prior to start of work on the completion of any CA, ensure you have reviewed the associated CR, investigation, this assignment, and if necessary contact the originator to ensure a complete understanding of the requested action.
2. Implement the requested actions. (e.g. Procedure should be implemented not submitted for change)
3. Document completion of action by completing each field in the following form or marking NA.
4. Additional guidance is provided by clicking here .. :
Clicking Here

Record of Extensions: (Note: Record the date, justification and approval received for each extension)

1

Document Corrective Action: (Note: Restate the requested action)

OpEval 07-007 - AF tunnel cover bolting Install design change on the Unit 1 AF tunnel covers to restore full design margin.

Document the Resolution: (Note: Clearly document the implementation of the Corrective Action to the requirements of LS-AA-125 Attachment 3. "That which is not documented is not done.")

Installed AF Tunnel flood seal cover modification's utilizing work order's 1101309,1101311, 1101312, 1101310 to install flood seal cover modifications on four each, flood seals 1AF-FSO1-6, 1AF-FSO1-7, 1AF-FSO1-8, 1AF-FSO1-9.

Document any changes to the intent of the original Actions (Include appropriate Department Head Approval): (Note: Document any deviation from the specific action and document the name of the Senior Manager/Director that authorized the deviation)

None

Document additional assignment determined during evaluation: (Note(s): Do not close to a promise - CA Type Assignments can only be closed to another CA Type Assignment on a CR)

None

Quality Signoff: (Note: Document the name of the person who is accountable for the completion of this assignment.)

Name: [redacted] Date: 01/05/09

Document Additional Details here:

Attachment 8

FUNCTIONAL FAILURE CAUSE DETERMINATION EVALUATION

Completion Notes: see inprogress notes for completion data.

Assign #: 06 **AR #: 00654270**

Aff Fac:	Braidwood	**Assign Type:**	CA	**Status:**	COMPLETE
Priority:		**Assigned To:**	[redacted]	**Due Date:**	12/31/2008
Schedule Ref:	A2R13	**Prim Grp:**	A8940OUT	**Orig Due Date:**	05/30/2008
Unit Condition:		**Sec Grp:**			

Assignment Details

Subject/Description: WC tracking task: OpEval 07-007 - AF tunnel cover bolting Track installation of design change on the Unit 2 AF tunnel covers to restore full design margin.

Assignment Completion

In Progress Notes: ****COMPLETE FOLLOWING STEPS PRIOR TO COMPLETION OF ASSIGNMENT****

1. Prior to start of work on the completion of any CA, ensure you have reviewed the associated CR, investigation, this assignment, and if necessary contact the originator to ensure a complete understanding of the requested action.
2. Implement the requested actions. (e.g. Procedure should be implemented not submitted for change)
3. Document completion of action by completing each field in the following form or marking NA.
4. Additional guidance is provided by clicking here : Clicking Here

Record of Extensions: (Note: Record the date, justification and approval received for each extension)

5/30/08 ([redacted]) Changed due date to 12/31/08 consistent with Revision 2 to Operability Evaluation 07-007. BR-40 signed by [redacted] for both MMD and WC.

Document Corrective Action: (Note: Restate the requested action)

WC tracking task: OpEval 07-007 - AF tunnel cover bolting Track installation of design change on the Unit 2 AF tunnel covers to restore full design margin.

Document the Resolution: (Note: Clearly document the implementation of the Corrective Action to the requirements of LS-AA-125 Attachment 3. "That which is not documented is not done.")

All Unit 2 AF tunnel hatch cover mods have been installed.

Document any changes to the intent of the original Actions (Include appropriate Department Head Approval): (Note: Document any deviation from the specific action and document the name of the Senior Manager/Director that authorized the deviation)

None

Document additional assignment determined during evaluation: (Note(s): Do not close to a promise - CA Type Assignments can only be closed to another CA Type Assignment on a CR)

None

Quality Signoff: (Note: Document the name of the person who is accountable for the completion of this assignment.)

Name: [redacted] Date: 12/29/08

Document Additional Details here:

Completion Notes: See in-progress notes.

Assign #: 07					**AR #: 00654270**
Aff Fac:	Braidwood	**Assign Type:**	CA	**Status:**	COMPLETE
Priority:		**Assigned To:**	[redacted]	**Due Date:**	12/31/2008
Schedule Ref:	A2R13	**Prim Grp:**	A8922MM	**Orig Due Date:**	05/30/2008
Unit Condition:		**Sec Grp:**			

Assignment Details

Subject/Description: CA4: OpEval 07-007 - AF tunnel cover bolting Install design change on the Unit 2 AF tunnel covers to restore full design margin.

Assignment Completion

In Progress Notes: 5/30/08 ([redacted]) Changed due date to 12/31/08 consistent with Revision 2 to Operability Evaluation 07-007. BR-40 signed by [redacted] for both MMD and WC.
****COMPLETE FOLLOWING STEPS PRIOR TO COMPLETION OF ASSIGNMENT****

1. Prior to start of work on the completion of any CA, ensure you have reviewed the associated CR, investigation, this assignment, and if necessary contact the originator to ensure a complete understanding of the requested action.
2. Implement the requested actions. (e.g. Procedure should be implemented not submitted for change)
3. Document completion of action by completing each field in the following form or marking NA.
4. Additional guidance is provided by clicking here .. :
Clicking Here

Record of Extensions: (Note: Record the date, justification and approval received for each extension)

Document Corrective Action: (Note: Restate the requested action)

Document the Resolution: (Note: Clearly document the implementation of the Corrective Action to the requirements of LS-AA-125 Attachment 3. "That which is not documented is not done.")

Document any changes to the intent of the original Actions (Include appropriate Department Head Approval): (Note: Document any deviation from the specific action and document the name of the Senior Manager/Director that authorized the deviation)

Document additional assignment determined during evaluation: (Note(s):

Do not close to a promise - CA Type Assignments can only be closed to another CA Type Assignment on a CR)

Quality Signoff: (Note: Document the name of the person who is accountable for the completion of this assignment.)

Name: Date:

Document Additional Details here:

Attachment 8

FUNCTIONAL FAILURE CAUSE DETERMINATION EVALUATION

Completion Notes: ALL FOUR AF TUNNEL HATCH MODIFICATIONS HAVE BEEN COMPLETED PER WORK ORDERS, 1101325, 1101329, 1101331, 1101326

Assign #: 08					**AR #: 00654270**
Aff Fac:	Braidwood	**Assign Type:**	CA	**Status:**	COMPLETE
Priority:		**Assigned To:**	[redacted]	**Due Date:**	01/09/2009
Schedule Ref:	A1R14	**Prim Grp:**	A8940OUT	**Orig Due Date:**	05/30/2008
Unit Condition:		**Sec Grp:**			

Assignment Details

Subject/Description: WC tracking task: OpEval 07-007 - AF tunnel cover bolting Track installation of design change on the Unit 1 AF tunnel covers to restore full design margin. (12/29/08 [redacted]) Due date moved to 1/9/09. Completed BR-40 paperwork is on file. Reason for the extension is manpower availability due to emergent plant issues and competing priorities. There are no extension impacts.

Assignment Completion

In Progress Notes: 5/30/08 ([redacted]) Changed due date to 12/31/08 consistent with Revision 2 to Operability Evaluation 07-007. BR-40 signed by [redacted] for both MMD and WC.
****COMPLETE FOLLOWING STEPS PRIOR TO COMPLETION OF ASSIGNMENT****

1. Prior to start of work on the completion of any CA, ensure you have reviewed the associated CR, investigation, this assignment, and if necessary contact the originator to ensure a complete understanding of the requested action.
2. Implement the requested actions. (e.g. Procedure should be implemented not submitted for change)
3. Document completion of action by completing each field in the following form or marking NA.
4. Additional guidance is provided by clicking here .. :
Clicking Here

Record of Extensions: (Note: Record the date, justification and approval received for each extension)

(2) Extension #1on 5/30/08 extended due date to 12/31/08, extension #2 extended due date from 12/31/08 to 1/9/09. BR-40s completed and on file.

Document Corrective Action: (Note: Restate the requested action)

oPeVAL 07-007 - AF Tunnel cover bolting, install design change on the U-1 AF tunnel covers to restore full design margin.

Document the Resolution: (Note: Clearly document the implementation of the Corrective Action to the requirements of LS-AA-125 Attachment 3. "That which is not documented is not done.")

AF Tunnel flood seal covers have been installed under work order numbers 1101309, 1101311, 1101312, and 1101310.

Document any changes to the intent of the original Actions (Include appropriate Department Head Approval): (Note: Document any deviation from the specific action and document the name of the Senior

Manager/Director that authorized the deviation)

None

Document additional assignment determined during evaluation: (Note(s): Do not close to a promise - CA Type Assignments can only be closed to another CA Type Assignment on a CR)

None

Quality Signoff: (Note: Document the name of the person who is accountable for the completion of this assignment.)

Name: [redacted] Date: 1/9/09

Document Additional Details here:

Attachment 8

FUNCTIONAL FAILURE CAUSE DETERMINATION EVALUATION

Completion Notes:

Assign #: 09					AR #: 00654270
Aff Fac:	Braidwood	**Assign Type:**	OPDB	**Status:**	COMPLETE
Priority:		**Assigned To:**		**Due Date:**	09/19/2007
Schedule Ref:		**Prim Grp:**	A8952DER	**Orig Due Date:**	09/19/2007
Unit Condition:		**Sec Grp:**			

Assignment Details

Subject/Description: OpEval 07-007: AF tunnel covers Update OpEval 07-007 to reflect updated CA dates.

Assignment Completion

In Progress Notes:

1.0 ISSUE IDENTIFICATION:

Title: AF Tunnel Cover Bolt Eval. Uses Non-standard Safety Factor

1.1 IR #: 654270

1.2 OpEval #: 07-007 Revision: 1

General Information:

1.3 Affected Station(s): Braidwood

1.4 Unit(s): 1 and 2

1.5 System: AF

1.6 Component(s) Affected: Unit 1 and 2 Aux. Feed Tunnel Flood Seals.

1.7 Detailed description of what SSC is degraded or the nonconforming condition, by what means and when first discovered, and extent of condition for all similarly affected SSCs:

The design analysis (calculation 5.6.3.9) for evaluation of the Auxiliary Feedwater Tunnel flood seal covers did not include the effects of a High Energy Line Break (HELB) on qualification of the covers and supporting elements. Additionally, the design analysis uses a non-standard factor of safety for qualification of the concrete expansion anchors (CEA's) used to support the covers. This condition was initially identified at Byron (IR's 653093 and 620080) and was found to be applicable to Braidwood (IR 654270). This condition affects the qualification of the following covers: 1AFFSO1-6, 1AFFSO1-7, 1AFFSO1-8, 1AFFSO1-9, 2AFFSO1-6, 2AFFSO1-7, 2AFFSO1-8 and 2AFFSO1-9.

Revision 1 of this OpEval changes the due dates of the items listed under corrective action 1 and corrective action 2. Note that the date for full qualification (design change installation date) has not changed.

2.0 EVALUATION:

2.1 Describe the safety function(s) or safety support function(s) of

the SSC. As a minimum the following should be addressed, as applicable, in describing the SSC safety or safety support function(s):

- Does the SSC receive/initiate an RPS or ESF actuation signal?

- Is the SSC in the main flow path of an ECCS or support system?

- Is the SSC used to:

- Maintain reactor coolant pressure boundary integrity?

- Shutdown the reactor?

- Maintain the reactor in a safe shutdown condition?

- Prevent or mitigate the consequences of an accident that could result in offsite exposures comparable to 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11 guidelines, as applicable.

- Does the SSC provide required support (i.e., cooling, lubrication, etc.) to a TS required SSC?

- Is the SSC used to provide isolation between safety trains, or between safety and non-safety ties?

- Is the SSC required to be operated manually to mitigate a design basis event?

- Have all safety functions described in TS been included?

- Have all safety functions of the SSC required during normal operation and potential accident conditions been included?

- Is the SSC used to assess conditions for Emergency Action Levels (EALs)?

There are two AF tunnel covers in each Main Steam Isolation Valve (MSIV) room. The covers provide a flood barrier and a HELB barrier between the MSIV room and AF tunnel. The barrier protects the AF013 valves from the effects of flooding or a HELB in the MSIV rooms. The AF013 valves are maintained in the open position. If exposed to a harsh environment, these valves may not be able to close to provide their containment isolation function.

2.2 Describe the following, as applicable:
(a) the effect of the degraded or nonconforming condition on the SSC safety function(s);
(b) any requirements or commitments established for the SSC and any challenges to these;
(c) the circumstances of the degraded/nonconforming condition, including the possible failure mechanism(s);
(d) whether the potential failure is time dependent and whether the condition will continue to degrade and/or will the potential consequences increase; and
(e) the aggregate effect of the degraded or nonconforming condition in light of other open Op. Evals:

(a) The covers are designed to perform a sealing function (leak-tight) between the MSIV rooms and AF tunnel for all design loads including seismic. Based on the design analysis (calculation 5.6.3.9), the CEA's for the AF tunnel cover support members do not meet the structural design criteria requirements with respect to safety factor. The design criteria

require a factor of safety of 4 while the design analysis uses a factor of safety of 1. The effect of this condition is that the design margin for the CEA's is reduced. Additionally, the design analysis does not address the loading on the cover and support members due to a high energy line break. Failure of the cover or supporting members could expose the AF013 valves (located in the AF tunnel) to a harsh environment, which could adversely impact their containment isolation function.

(b) The AF tunnel covers are required to remain intact and in place to ensure that the AF013 valves are protected against the environments due to flooding and HELB within the MSIV rooms. Additionally, the structural design criteria require a factor of safety of 4 to be maintained for CEA's.

(c) The possible failure mechanisms associated with this condition are a catastrophic failure of the plate or supporting member, or the plastic deformation of the cover or supporting member. Either of these scenarios could expose the AF013 valves to an environment for which the AF013 valves have not been qualified.

(d) The AF tunnel covers and associated support components have been qualified independently for the worst case HELB and the worst case flood in the MSIV room. Since worst-case conditions are used, the potential failure is not time-dependant. Additionally the potential consequences will not change over time since worst-case conditions were used.

(e) There are currently eight other open OpEvals at Braidwood. None are associated with the AF tunnel covers. Thus, this non-conforming condition has no impact on the previously evaluated degraded conditions associated with the open OpEvals.

2.3 Is SSC operability supported? Explain basis (e.g., analysis, test, operating experience, engineering judgment, etc.): Yes

The design analysis (calculation 5.6.3.9) for the AF tunnel cover and supporting members was reviewed to determine the impact of the HELB loading on qualification of the CEA's. Per this design analysis, the minimum calculated safety factor for the CEA's is 1.08 (associated with a loading of 15.8 psi). All other components have a factor of safety of at least 1.25.

The HELB load case results in a cover load of 19.7 psi. Thus, the cover loading has increased by approximately 25% (19.7 psi / 15.8 psi) over the originally analyzed load. Since all other components associated with the AF tunnel cover and supporting components have at least a factor of safety of 1.25, only the CEA's require further evaluation for acceptability for the HELB loading.

OP-AA-108-115 discusses an operability safety factor of 2 for concrete anchor bolts associated with pipe supports. The safety factor is based on guidance provided in NRC Bulletin 79-02, "Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts". Premature failures of CEAs utilized in pipe support base plate designs in the 1970's prompted the NRC to issue guidance for factors of safety applicable to CEAs associated with these supports. Note that the CEA failures were the result of cyclic loads on the CEAs, improperly torqued CEAs and base plate designs that were assumed to behave rigidly but were actually flexible.

The anchors in question are not associated with a pipe support. The anchors support a structural member. The only appreciable cyclic loading associated with these anchors is the excitation of the AF tunnel cover plate due to a seismic load. The factor of safety associated with this

load case is considerable (much larger than 4). Additionally, the issue of plate flexibility does not apply for the installed angle. It was also determined that the issue with improperly torqued fasteners was not applicable at Braidwood per the station response to NRC Bulletin 79-02. Thus, the parameters that were applicable to the pipe support anchors and base plate do not apply to this structural application. Although using a safety factor of 2 for operability of structural CEAs is conservative, there is currently no industry guidance that requires the use of this safety factor. It is reasonable to use an interaction ratio of 1, consistent with the guidance provided in ACI 349 (American Concrete Institute) when determining operability for structural qualification (i.e., safety factor of 1)

The design analysis of the CEA's was reviewed to identify whether any conservatisms exist. Based on this review, the following was identified:

1) The postulated load distribution along the AF tunnel cover edge supported by the angle and CEAs was based on ACI 63 distribution factors considering two-way plate behavior. The load distribution using this approach is extremely conservative in calculating safety factor for the CEAs. The primary conservatism results from assuming that all four sides of the plate are similarly supported. For the installed configuration, three edges of the cover plate are supported by the rigid structural elements and one edge is supported by the angle iron with CEAs. A more realistic load distribution based on the relative stiffness of the supporting element would significantly reduce loads on the angle iron CEAs.
2) An extremely conservative approach has been used in transferring loads from the angle iron to the CEAs by decoupling local applied moment.
3) The load resulting from a HELB on the angle is currently (in the design analysis) assumed to act at the hold-down bolt location. Since the load acts downward, the load can be applied at the midpoint of the angle's bearing surface. Additionally, the actual concrete strength could be used to reduce conservatism.
4) Based on a review of the installation detail, the anchor spacing used in the design analysis to calculate loads on the CEAs is conservative. The design analysis has reduced the safety factor for the CEAs based on the assumption that one less CEA is installed than required by the design detail.

When taking into account the conservatisms identified above, it is apparent that the CEAs used to support angle for the AF tunnel cover would actually have a factor of safety greater than 1 when considering the HELB load case. Thus, although the CEAs do not conform to the administrative limit for safety factors applicable to CEAs (safety factor of 4), operability is supported. However, the design margin has been reduced.

If 2.3 = NO, notify Operations Shift Management immediately.
If 2.3 = YES, clearly document the basis for the determination.

2.4 Are compensatory and/or corrective actions required? YES

There are no required compensatory actions. See Section 3.0 for required corrective actions. These actions are required in order to ensure compliance with the structural design criteria.

If 2.4 = YES, complete section 3.0 (if NO, N/A section 3.0).

2.5 Reference Documents:

2.5.1 Technical Specifications and Bases Section(s):
3.7.5 Aux. Feedwater System

2.5.2 UFSAR Section(s):
3.0 Design of Structures, Components, Equipment, and Systems
3.6 Protection Against Dynamic Effects Associated with the Postulated Break of Piping
Attach. C3.6 Main Steamline Break in Main Steam Tunnel
3.11 Environmental Design of Mechanical and Electrical Equipment
15.1.5 Steam System Piping Break at Zero Power
15.1.6 Steam System Piping Break at Full Power

2.5.3 Other:
Dwg S-895, Rev AD
Dwg S-896, Rev. W
Dwg S-969 Rev. AF
Dwg S-970, Rev AB
Dwg S-1062, Rev. X
Dwg S-1088, Rev. N
Dwg S-1093, Rev. U
Dwg S-1502, Rev. G
Calc. 5.6.3, Rev. 005
Calc. 5.6.3-BRW-96-608, Rev. 001
Calc. 3C8-0282-001, Rev. 003

3.0 ACTION ITEM LIST:
If, through evaluating SSC operability, it is determined that the degraded or nonconforming SSC does not prevent accomplishment of the specified safety function(s) in the TS and the intention is to continue operating the plant in that condition, then record below, as appropriate, any required compensatory actions to support operability and/or corrective actions required to restore full qualification. For corrective actions, document when the actions should be completed (e.g., immediate, within next 13 week period, next outage, etc.) and the basis for timeliness of the action. Corrective action timeframes longer than the next refueling outage are to be explicitly justified as part of the OpEval or deficiency tracking documentation being used to perform the corrective action.

Corrective Action #1: Determine scope and extent of change (modification), Get installation estimate. Feed this info to WC for their ATI.
Responsible Dept./Supv.: DEM
Action Due: 11/30/2007
Basis for timeliness of action: There is no time-dependent degradation concern with this issue. The due date is a reasonable amount of time.
Action Tracking #: 654270-03

Corrective Action #2: Determine installation completion date and generate appropriate corrective actions.
Responsible Dept./Supv.: Work Control
Action Due: 12/14/2007
Basis for timeliness of action: There is no time-dependent degradation concern with this issue. The due date is a reasonable amount

of time.
Action Tracking #: 654270-04

Corrective Action #3: Install a design change on the Unit 1 AF tunnel covers to restore full design margin
Responsible Dept./Supv.: MMD
Action Due: 05/30/2008
Basis for timeliness of action: There is no time-dependent degradation concern with this issue. The due date is a reasonable amount of time.
Action Tracking #: 654270-05

Corrective Action #4: Install a design change on the Unit 2 AF tunnel covers to restore full design margin
Responsible Dept./Supv.: MMD
Action Due: 05/30/2008
Basis for timeliness of action: There is no time-dependent degradation concern with this issue. The due date is a reasonable amount of time.
Action Tracking #: 654270-06

4.0 SIGNATURES:

4.1 Preparer(s) [redacted] / Date 09/19/07

[redacted] / Date 09-19-07

4.2 Reviewer [redacted] / Date 9/19/07

3rd Party [redacted] / Date 9-19-07
Review

4.3 Sr. Manager Design Engg/Designee Concurrence [redacted] Date 9/19/07

4.4 Operations Shift Management Approval [redacted] Date 9/19/07

4.5 Ensure the completed form is forwarded to the OEPM for processing and Action Tracking entry as appropriate.

5.0 OPERABILITY EVALUATION CLOSURE:

5.1 Corrective actions are complete, as necessary, and the OpEval is ready for closure

/ Date
(OEPM)

5.2 Operations Shift Management Approval / Date

5.3 Ensure the completed form is forwarded to the OEPM for processing,

Action Tracking entry, and cancellation of any open compensatory actions, as appropriate.

Completion Notes: Revision 1 to OpEval 07-007 is complete. The revision only updated the due dates for corrective actions 1 and 2. This item can be closed.