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This Document contains 3 Pages.

Document No. ER002357E201 Rev./Change No. 0

Title HPSI Injection Valve Plug Design Change

Brief description of proposed change:

The change is the replacement of the valve plugs in the ANO-2 HPSI injection MOV's, tag #'s 2CV-5015-1/5016-2/5035-1/5036-2/5055-1/5056-2/5075-1/5076-2, with plugs of a different design. The replacement plugs are of a different material and shape than the existing plugs. The plugs are being replaced in order to alleviate scoring problems previously encountered. The change also includes the chamfering of the edges of the valve body outlet port, also to reduce the potential for future scoring.

Will the proposed Activity:

1. Require a change to the Operating License including:

   Technical Specifications (excluding the bases)? Yes☐ No☒

   Operating License? Yes☐ No☒

   Confirmatory Orders? Yes☐ No☒

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:

   SAR (multi-volume set for each unit)? Yes☒ No☐

   Core Operating Limits Report? Yes☐ No☒

   Fire Hazards Analysis? Yes☐ No☒

   Bases of the Technical Specifications? Yes☐ No☒

   Technical Requirements Manual? Yes☐ No☒

   NRC Safety Evaluation Reports? Yes☐ No☒

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒

4. Result in a potential impact to the environment? (Complete Environmental Impact Determination of this form.) Yes☐ No☒

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7?

   QAPM? Yes☐ No☒

   E-Plan? Yes☐ No☒

8. Does this review depend on future NRC approval of other actions? (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No☒

Document No. ER002357E201 Rev./Change No. 0

Basis for Determination (Questions 1, 2, & 3):

Question 1 Response: The HPSI injection valve plug design is not addressed in the operating license and therefore no change is required to the operating license.

Question 2 Response: The HPSI injection valve plug material is addressed in SAR Sections 6.3.2.4 and 6.3.2.19. Specifically, these SAR sections convey that components of the SIS (or materials in contact with radioactive coolant) are fabricated of austenitic stainless steel, and the valve seats are stellite or equivalent material. The entire replacement plugs ~~is~~ are constructed of the NOREM B1 material (i.e., no hardfacing of a different material) which is ~~not~~ considered to be austenitic stainless steel. No other SAR document is affected by this change.

Rev 1

, neither of R&S 8/1/00 Rev1

or NOREM 02A R&S 8/1/00 Rev1

Question 3 Response: No test or experiment not described in the SAR is involved with this change. Post modification testing will consist of existing test activities.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # ___ (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document	Section
LRS:	All (valve, HPSI, high pressure safety Injection, 2CV-5015-1, 2CV-5016-2, 2CV-5035-1, 2CV-5036-2, 2CV-5055-1, 2CV-5056-2, 2CV-5075-1, 2CV-5076-2, stellite, cobalt)
MANUAL SECTIONS:	6.3
FIGURES:	Table 6.3-1, Table 6.3-3, Figure 6.3-2

Stephen J. Lynn — Stephen J. Lynn — 5-22-00

Certified Reviewer's Signature | Printed Name | Date

Reviewer's certification expiration date: 5/26/01

Assistance provided by:

Printed Name	Scope of Assistance	Date
Randall S. Smith	LRS Search	4/14/00

Search Scope Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

Steve Chandler — Steve Chandler — 5-25-00

Certified Reviewer's Signature | Printed Name | Date

ENVIRONMENTAL IMPACT DETERMINATION
(UNIT 1 and UNIT 2)

Document No. ER002357E201 Rev./Change No. 0

Complete the following Determination. If the answer to any item below is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

ARKANSAS NUCLEAR ONE		Page 1
FORM TITLE: 10CFR50.59 REVISION	RM NO. 1000.131D	REV. 003-04-0

This Document contains 1 Page.

Document No. ER002357E201 Rev./Change No. 1 10CFR50.59 Eval. No. FFN#00-056

Revision No. 1

This form is to be used to document Revisions to 10CFR50.59 Evaluations. Revisions to a 10CFR50.59 Evaluation after PSC review may become necessary due to SRC review, changes to the original document, etc. Refer to section 6.2.4 of this procedure for additional guidance.

Reason for revision to 10CFR50.59 Evaluation:

ANO has been informed by the supplier that the valve plugs ordered in conjunction with ER002357E201 through E208 are now only available in a material designated as NOREM 02A (NOREM B1 was the previously available hardface material). ER002357E209 has been generated to provide the documentation of equivalency based on information provided by the supplier. This revision to the 50.59 evaluation is required due to specific reference in the original evaluation to the new plug material. No change to the response for Questions 1 through 7 is required.

Will the proposed revision result in any additional:

1)	Change to the Operating License?	Yes ☐ No ☒
2)	Change to other Licensing Basis Document?	Yes ☐ No ☒
3)	Conduct of test or experiment?	Yes ☐ No ☒
4)	Impact to the environment?	Yes ☐ No ☒
5)	Need for a Radiological Safety Evaluation?	Yes ☐ No ☒
6)	Impact Ventilated Storage Cask Activities	Yes ☐ No ☒
7)	Impact the QAPM or E-Plan?	Yes ☐ No ☒

If yes, describe below and take appropriate action as per initial Determination:

N/A

Indicate revisions to the 10CFR50.59 Evaluation by placing revision number at the top right hand corner of each page of the form(s). Changes should be lined through, initialed, dated and indicated with the revision number. For extensive changes, new forms may be used with revision bars in the margin denoting changes. Attach this form to front of previous 10CFR50.59 Evaluation. Return to the PSC for review.

Stephen J. Lynn — Certified Reviewer's Signature

Stephen J. Lynn — Printed Name

8-29-00 — Date

Reviewer's certification expiration date: 5/26/01

PSC review: _____ Date: 9/21/00

Rev. 1

Document No. ER002357E201 Rev./Change No. 0

10CFR50.59 Review Continuation Page

Synopsis of Modification

ER002357E201 replaces the valve plugs of the eight HPSI injection MOV's with an updated design. The existing plug design has exhibited a tendency to become scored when operated during high flow conditions. Once scored, the possibility of galling is heightened. The new plug design differs in two respects from the existing design. The existing stainless steel plug material is replaced with an alloy known as NOREM B1 (also known as NOREM 01). This material, developed by EPRI, is recommended by the valve manufacturer as a replacement plug material for this application. It was developed as a hardfacing material, however, for valve sizes 2" and smaller (the subject valves are 2") the entire plug is constructed of the material. The superior hardness of the new plug material in relation to the stainless steel valve body reduces the possibility of scoring and galling. The new plug design is also shaped differently from the existing plug. The new plug is what is known as a double taper design. Per the valve manufacturer, the Cv of the valve is not changed by the change in plug shape or material. Testing performed by ANO personnel at the Wyle test facilities has confirmed the superior performance offered by the new plug design in terms of resistance to scoring and reduced valve factor. or by NOREM 02A. RBB 8/7/00 Rev 1

Another facet of the change is the chamfering of the edge of the outlet port. The damage seen previously has been concentrated in the outlet port area and is believed to be the result of the plug passing the existing sharp edges of the outlet port and in essence being scraped by that sharp edge.

Finally, the valve bodies will be honed (if needed) prior to installation of the new plugs. This will further reduce the possibility of future scoring.

Post modification testing will include applicable MOV testing, system flow verification and stroke timing. However, if the associated manual valves used for flow balancing are required for isolation or are otherwise disturbed, a workplan to rebalance system flows may be required.

Design Basis

Flow balance of the system is accomplished by throttling of the manual valve associated with each injection MOV. The new plug design will not alter the flow characteristics of the balanced system because the injection MOV's are opened fully and plug shape of the MOV's is not a controlling factor. The NOREM B1 material is compatible with radioactive fluid contact and contains <0.1% by weight of cobalt. This material has been ~~previously~~ evaluated and found acceptable for use at ANO (Reference Specification ANO-M-2456). This change is intended only to replace an existing valve component with a more suitable design. No risk is added by virtue of this modification. RBB 8/7/00 Rev 1 and NOREM 02A RBB 8/7/00 Rev 1

The change will cause one aspect of the SAR to no longer be true in that the SAR states that all SIS components in contact with the radioactive coolant are austenitic stainless steel except for valve seats. Since the entire plug is of the NOREM B1 alloy (not considered an austenitic stainless steel), an LDCR will be processed to effect a change to the SAR. or NOREM 02A RBB 8/7/00 Rev 1

Answers Form 1000.131B Questions

Question 1 Response: HPSI system component failure is not credited with initiating any of the previously evaluated accidents in the SAR. The valves will remain normally closed and will open in response to a safeguards actuation as before. Replacement of the injection MOV plugs with an updated design does not therefore increase the probability of an accident previously evaluated in the SAR.

Question 2 Response: The replacement valve plugs will provide the same component function as the existing plugs. The change in material and shape of the plugs will also not affect HPSI system functional performance, i.e., flow capacity and isolation capability are unaffected. Therefore, the consequences of an accident previously evaluated in the SAR is not increased.

Question 3 Response: The replacement plugs are constructed to the same Code requirements and ANO design specification as the existing plugs and will serve identical functions. The conditions under which any associated system equipment operates is unchanged. Therefore, the probability of the malfunction of equipment important to safety is not increased.

Question 4 Response: No change in HPSI system configuration or functional capabilities is introduced by this change. The consequence of failure of the new valve plug design is identical to that which would have previously been experienced. Therefore, the consequences of a malfunction of equipment important to safety are unchanged.

Question 5 Response: The change in valve plug design does not affect HPSI system operation or configuration or its interface with other plant systems. It is therefore not credible that an accident of a different type than any previously evaluated in the SAR would be created.

Question 6 Response: No change in HPSI system capabilities or performance is introduced by this change. The new plug design is subject to the same Code requirements and ANO design specification stipulations as the existing plugs and will serve identical functions. No malfunction of equipment important to safety of a different type than previously evaluated in the SAR will be created.

Question 7 Response: The performance capabilities of the HPSI system or any of its components are unaffected by the change of injection MOV plug design. Because the HPSI system and component performance is unaffected, the margin of safety defined in the basis for any technical specification will not be reduced.

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This Document contains 3 Pages.

Document No. ER002357E201 Rev./Change No. 0

Title HPSI Injection Valve Plug Design Change

Brief description of proposed change:

The change is the replacement of the valve plugs in the ANO-2 HPSI injection MOV's, tag #'s 2CV-5015-1/5016-2/5035-1/5036-2/5055-1/5056-2/5075-1/5076-2, with plugs of a different design. The replacement plugs are of a different material and shape than the existing plugs. The plugs are being replaced in order to alleviate scoring problems previously encountered. The change also includes the chamfering of the edges of the valve body outlet port, also to reduce the potential for future scoring.

Will the proposed Activity:

1. Require a change to the Operating License including:

   Technical Specifications (excluding the bases)? Yes☐ No☒

   Operating License? Yes☐ No☒

   Confirmatory Orders? Yes☐ No☒

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:

   SAR (multi-volume set for each unit)? Yes☒ No☐

   Core Operating Limits Report? Yes☐ No☒

   Fire Hazards Analysis? Yes☐ No☒

   Bases of the Technical Specifications? Yes☐ No☒

   Technical Requirements Manual? Yes☐ No☒

   NRC Safety Evaluation Reports? Yes☐ No☒

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒

4. Result in a potential impact to the environment? (Complete Environmental Impact Determination of this form.) Yes☐ No☒

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7?

   QAPM? Yes☐ No☒

   E-Plan? Yes☐ No☒

8. Does this review depend on future NRC approval of other actions? (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No☒

Rev 1

Document No. ER002357E201 Rev./Change No. 0

Basis for Determination (Questions 1, 2, & 3):

Question 1 Response: The HPSI injection valve plug design is not addressed in the operating license and therefore no change is required to the operating license.

Question 2 Response: The HPSI injection valve plug material is addressed in SAR Sections 6.3.2.4 and 6.3.2.19. Specifically, these SAR sections convey that components of the SIS (or materials in contact with radioactive coolant) are fabricated of austenitic stainless steel, and the valve seats are stellite or equivalent material. The entire replacement plugs ~~is~~ are constructed of the NOREM B1 material (i.e., no hardfacing of a different material) which is ~~not~~ considered to be austenitic stainless steel. No other SAR document is affected by this change. (neither of R&S 8/1/00 Rev 1 or NOREM 02A R&S 8/1/00 Rev 1)

Rev 1

Question 3 Response: No test or experiment not described in the SAR is involved with this change. Post modification testing will consist of existing test activities.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # ___ (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document	Section
LRS:	All (valve, HPSI, high pressure safety Injection, 2CV-5015-1, 2CV-5016-2, 2CV-5035-1, 2CV-5036-2, 2CV-5055-1, 2CV-5056-2, 2CV-5075-1, 2CV-5076-2, stellite, cobalt)
MANUAL SECTIONS:	6.3
FIGURES:	Table 6.3-1, Table 6.3-3, Figure 6.3-2

Stephen J. Lynn — Stephen J. Lynn — 5-22-00
Certified Reviewer's Signature — Printed Name — Date

Reviewer's certification expiration date: 5/26/01

Assistance provided by:

Printed Name	Scope of Assistance	Date
Randall S. Smith	LRS Search	4/14/00

Search Scope Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

Steve Chandler — Steve Chandler — 5-25-00
Certified Reviewer's Signature — Printed Name — Date

~~ER002357E201~~ R&S 8/29/00
~~PAGE 6 REV 0~~

ENVIRONMENTAL IMPACT DETERMINATION
(UNIT 1 and UNIT 2)

Document No. ER002357E201 Rev./Change No. 0

Complete the following Determination. If the answer to any item below is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

FORM: 10CFR50.59 REVISION	FORM NO. 1000.131D	REV. 003-04-0

This Document contains 1 Page.

Document No. ER002357E201 Rev./Change No. 1 10CFR50.59 Eval. No. FFN#00-057

Revision No. 1

This form is to be used to document Revisions to 10CFR50.59 Evaluations. Revisions to a 10CFR50.59 Evaluation after PSC review may become necessary due to SRC review, changes to the original document, etc. Refer to section 6.2.4 of this procedure for additional guidance.

Reason for revision to 10CFR50.59 Evaluation:

ANO has been informed by the supplier that the valve plugs ordered in conjunction with ER002357E201 through E208 are now only available in a material designated as NOREM 02A (NOREM B1 was the previously available hardface material). ER002357E209 has been generated to provide the documentation of equivalency based on information provided by the supplier. This revision to the 50.59 evaluation is required due to specific reference in the original evaluation to the new plug material. No change to the response for Questions 1 through 7 is required.

Will the proposed revision result in any additional:

1)	Change to the Operating License?	Yes ☐	No ☒
2)	Change to other Licensing Basis Document?	Yes ☐	No ☒
3)	Conduct of test or experiment?	Yes ☐	No ☒
4)	Impact to the environment?	Yes ☐	No ☒
5)	Need for a Radiological Safety Evaluation?	Yes ☐	No ☒
6)	Impact Ventilated Storage Cask Activities	Yes ☐	No ☒
7)	Impact the QAPM or E-Plan?	Yes ☐	No ☒

If yes, describe below and take appropriate action as per initial Determination:

N/A

Indicate revisions to the 10CFR50.59 Evaluation by placing revision number at the top right hand corner of each page of the form(s). Changes should be lined through, initialed, dated and indicated with the revision number. For extensive changes, new forms may be used with revision bars in the margin denoting changes. Attach this form to front of previous 10CFR50.59 Evaluation. Return to the PSC for review.

Stephen J. Lynn — Certified Reviewer's Signature

Stephen J. Lynn — Printed Name

8-29-00 — Date

Reviewer's certification expiration date: 5/26/01

PSC review: _____ Date: 9/21/00

Rev. 1

Document No. ER002357E201 Rev./Change No. 0

10CFR50.59 Review Continuation Page

Synopsis of Modification

ER002357E201 replaces the valve plugs of the eight HPSI injection MOV's with an updated design. The existing plug design has exhibited a tendency to become scored when operated during high flow conditions. Once scored, the possibility of galling is heightened. The new plug design differs in two respects from the existing design. The existing stainless steel plug material is replaced with an alloy known as NOREM B1 (also known as NOREM 01). This material, developed by EPRI, is recommended by the valve manufacturer as a replacement plug material for this application. It was developed as a hardfacing material, however, for valve sizes 2" and smaller (the subject valves are 2") the entire plug is constructed of the material. The superior hardness of the new plug material in relation to the stainless steel valve body reduces the possibility of scoring and galling. The new plug design is also shaped differently from the existing plug. The new plug is what is known as a double taper design. Per the valve manufacturer, the Cv of the valve is not changed by the change in plug shape or material. Testing performed by ANO personnel at the Wyle test facilities has confirmed the superior performance offered by the new plug design in terms of resistance to scoring and reduced valve factor. or by NOREM 02A. R&R 8/7/00 Rev 1

Another facet of the change is the chamfering of the edge of the outlet port. The damage seen previously has been concentrated in the outlet port area and is believed to be the result of the plug passing the existing sharp edges of the outlet port and in essence being scraped by that sharp edge.

Finally, the valve bodies will be honed (if needed) prior to installation of the new plugs. This will further reduce the possibility of future scoring.

Post modification testing will include applicable MOV testing, system flow verification and stroke timing. However, if the associated manual valves used for flow balancing are required for isolation or are otherwise disturbed, a workplan to rebalance system flows may be required.

Design Basis

Flow balance of the system is accomplished by throttling of the manual valve associated with each injection MOV. The new plug design will not alter the flow characteristics of the balanced system because the injection MOV's are opened fully and plug shape of the MOV's is not a controlling factor. The NOREM B1 and NOREM 02A material is compatible with radioactive fluid contact and contains <0.1% by weight of cobalt. This material has been ~~previously~~ evaluated and found acceptable for use at ANO (Reference Specification ANO-M-2456). This change is intended only to replace an existing valve component with a more suitable design. No risk is added by virtue of this modification. R&R 8/7/00 Rev 1

The change will cause one aspect of the SAR to no longer be true in that the SAR states that all SIS components in contact with the radioactive coolant are austenitic stainless steel except for valve seats. Since the entire plug is of the NOREM B1 alloy (not considered an austenitic stainless steel), an LDCR will be processed to effect a change to the SAR. or NOREM 02A R&R 8/7/00 Rev. 1

Answers Form 1000.131B Questions

Question 1 Response: HPSI system component failure is not credited with initiating any of the previously evaluated accidents in the SAR. The valves will remain normally closed and will open in response to a safeguards actuation as before. Replacement of the injection MOV plugs with an updated design does not therefore increase the probability of an accident previously evaluated in the SAR.

Question 2 Response: The replacement valve plugs will provide the same component function as the existing plugs. The change in material and shape of the plugs will also not affect HPSI system functional performance, i.e., flow capacity and isolation capability are unaffected. Therefore, the consequences of an accident previously evaluated in the SAR is not increased.

Question 3 Response: The replacement plugs are constructed to the same Code requirements and ANO design specification as the existing plugs and will serve identical functions. The conditions under which any associated system equipment operates is unchanged. Therefore, the probability of the malfunction of equipment important to safety is not increased.

Question 4 Response: No change in HPSI system configuration or functional capabilities is introduced by this change. The consequence of failure of the new valve plug design is identical to that which would have previously been experienced. Therefore, the consequences of a malfunction of equipment important to safety are unchanged.

Question 5 Response: The change in valve plug design does not affect HPSI system operation or configuration or its interface with other plant systems. It is therefore not credible that an accident of a different type than any previously evaluated in the SAR would be created.

Question 6 Response: No change in HPSI system capabilities or performance is introduced by this change. The new plug design is subject to the same Code requirements and ANO design specification stipulations as the existing plugs and will serve identical functions. No malfunction of equipment important to safety of a different type than previously evaluated in the SAR will be created.

Question 7 Response: The performance capabilities of the HPSI system or any of its components are unaffected by the change of injection MOV plug design. Because the HPSI system and component performance is unaffected, the margin of safety defined in the basis for any technical specification will not be reduced.

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This Document contains 3 Pages.

Document No. ER002357E201 Rev./Change No. 0

Title HPSI Injection Valve Plug Design Change

Brief description of proposed change:

The change is the replacement of the valve plugs in the ANO-2 HPSI injection MOV's, tag #'s 2CV-5015-1/5016-2/5035-1/5036-2/5055-1/5056-2/5075-1/5076-2, with plugs of a different design. The replacement plugs are of a different material and shape than the existing plugs. The plugs are being replaced in order to alleviate scoring problems previously encountered. The change also includes the chamfering of the edges of the valve body outlet port, also to reduce the potential for future scoring.

Will the proposed Activity:

1. Require a change to the Operating License including:

   Technical Specifications (excluding the bases)? Yes☐ No☒

   Operating License? Yes☐ No☒

   Confirmatory Orders? Yes☐ No☒

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:

   SAR (multi-volume set for each unit)? Yes☒ No☐

   Core Operating Limits Report? Yes☐ No☒

   Fire Hazards Analysis? Yes☐ No☒

   Bases of the Technical Specifications? Yes☐ No☒

   Technical Requirements Manual? Yes☐ No☒

   NRC Safety Evaluation Reports? Yes☐ No☒

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒

4. Result in a potential impact to the environment? (Complete Environmental Impact Determination of this form.) Yes☐ No☒

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7?

   QAPM? Yes☐ No☒

   E-Plan? Yes☐ No☒

8. Does this review depend on future NRC approval of other actions? (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No☒

Document No. ER002357E201 Rev./Change No. 0

Basis for Determination (Questions 1, 2, & 3):

Question 1 Response: The HPSI injection valve plug design is not addressed in the operating license and therefore no change is required to the operating license.

Question 2 Response: The HPSI injection valve plug material is addressed in SAR Sections 6.3.2.4 and 6.3.2.19. Specifically, these SAR sections convey that components of the SIS (or materials in contact with radioactive coolant) are fabricated of austenitic stainless steel, and the valve seats are stellite or equivalent material. The entire replacement plugs ~~is~~ are constructed of the NOREM B1 material (i.e., no hardfacing of a different material), which is ~~not~~ considered to be austenitic stainless steel.) No other SAR document is affected by this change. (, neither of RBS 8/1/00 Rev1 or NOREM 02A RBS 8/1/00 Rev1) Rev 1

Question 3 Response: No test or experiment not described in the SAR is involved with this change. Post modification testing will consist of existing test activities.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # ___. (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document	Section
LRS:	All (valve, HPSI, high pressure safety Injection, 2CV-5015-1, 2CV-5016-2, 2CV-5035-1, 2CV-5036-2, 2CV-5055-1, 2CV-5056-2, 2CV-5075-1, 2CV-5076-2, stellite, cobalt)
MANUAL SECTIONS:	6.3
FIGURES:	Table 6.3-1, Table 6.3-3, Figure 6.3-2

Stephen J. Lynn — Stephen J. Lynn — 5-22-00
Certified Reviewer's Signature — Printed Name — Date

Reviewer's certification expiration date: 5/26/01

Assistance provided by:

Printed Name	Scope of Assistance	Date
Randall S. Smith	LRS Search	4/14/00

Search Scope Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

Certified Reviewer's Signature — Steve Chandler — Printed Name — 5-25-00 — Date

~~ER002357E201~~ RBS 8/24/00
~~PAGE 6 REV 0~~

ENVIRONMENTAL IMPACT DETERMINATION
(UNIT 1 and UNIT 2)

Document No. ER002357E201 Rev./Change No. 0

Complete the following Determination. If the answer to any item below is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

FORM TITLE: 10CFR50.59 REVISION	FORM NO. 1000.131D	REV. 003-04-0

This Document contains 1 Page.

Document No. ER002357E201 Rev./Change No. 1 10CFR50.59 Eval. No. FFN# 00-058

Revision No. 1

This form is to be used to document Revisions to 10CFR50.59 Evaluations. Revisions to a 10CFR50.59 Evaluation after PSC review may become necessary due to SRC review, changes to the original document, etc. Refer to section 6.2.4 of this procedure for additional guidance.

Reason for revision to 10CFR50.59 Evaluation:

ANO has been informed by the supplier that the valve plugs ordered in conjunction with ER002357E201 through E208 are now only available in a material designated as NOREM 02A (NOREM B1 was the previously available hardface material). ER002357E209 has been generated to provide the documentation of equivalency based on information provided by the supplier. This revision to the 50.59 evaluation is required due to specific reference in the original evaluation to the new plug material. No change to the response for Questions 1 through 7 is required.

Will the proposed revision result in any additional:

1)	Change to the Operating License?	Yes ☐ No ☒
2)	Change to other Licensing Basis Document?	Yes ☐ No ☒
3)	Conduct of test or experiment?	Yes ☐ No ☒
4)	Impact to the environment?	Yes ☐ No ☒
5)	Need for a Radiological Safety Evaluation?	Yes ☐ No ☒
6)	Impact Ventilated Storage Cask Activities	Yes ☐ No ☒
7)	Impact the QAPM or E-Plan?	Yes ☐ No ☒

If yes, describe below and take appropriate action as per initial Determination:

N/A

Indicate revisions to the 10CFR50.59 Evaluation by placing revision number at the top right hand corner of each page of the form(s). Changes should be lined through, initialed, dated and indicated with the revision number. For extensive changes, new forms may be used with revision bars in the margin denoting changes. Attach this form to front of previous 10CFR50.59 Evaluation. Return to the PSC for review.

Stephen J. Lynn — Certified Reviewer's Signature

Stephen J. Lynn — Printed Name

8-29-00 — Date

Reviewer's certification expiration date: 5/26/01

PSC review: _____ Date: 9/21/00

ER002357E203
PAGE 8 REV 1

Rev. 1

Document No. ER002357E201 Rev./Change No. 0

10CFR50.59 Review Continuation Page

Synopsis of Modification

ER002357E201 replaces the valve plugs of the eight HPSI injection MOV's with an updated design. The existing plug design has exhibited a tendency to become scored when operated during high flow conditions. Once scored, the possibility of galling is heightened. The new plug design differs in two respects from the existing design. The existing stainless steel plug material is replaced with an alloy known as NOREM B1 (also known as NOREM 01). This material, developed by EPRI, is recommended by the valve manufacturer as a replacement plug material for this application. It was developed as a hardfacing material, however, for valve sizes 2" and smaller (the subject valves are 2") the entire plug is constructed of the material. The superior hardness of the new plug material in relation to the stainless steel valve body reduces the possibility of scoring and galling. The new plug design is also shaped differently from the existing plug. The new plug is what is known as a double taper design. Per the valve manufacturer, the Cv of the valve is not changed by the change in plug shape or material. Testing performed by ANO personnel at the Wyle test facilities has confirmed the superior performance offered by the new plug design in terms of resistance to scoring and reduced valve factor. or by NOREM 02A. RBB 8/7/00 Rev 1

Another facet of the change is the chamfering of the edge of the outlet port. The damage seen previously has been concentrated in the outlet port area and is believed to be the result of the plug passing the existing sharp edges of the outlet port and in essence being scraped by that sharp edge.

Finally, the valve bodies will be honed (if needed) prior to installation of the new plugs. This will further reduce the possibility of future scoring.

Post modification testing will include applicable MOV testing, system flow verification and stroke timing. However, if the associated manual valves used for flow balancing are required for isolation or are otherwise disturbed, a workplan to rebalance system flows may be required.

Design Basis

Flow balance of the system is accomplished by throttling of the manual valve associated with each injection MOV. The new plug design will not alter the flow characteristics of the balanced system because the injection MOV's are opened fully and plug shape of the MOV's is not a controlling factor. The NOREM B1 and NOREM 02A material is compatible with radioactive fluid contact and contains <0.1% by weight of cobalt. This material has been ~~previously~~ evaluated and found acceptable for use at ANO (Reference Specification ANO-M-2456). This change is intended only to replace an existing valve component with a more suitable design. No risk is added by virtue of this modification. RBB 8/7/00 Rev 1 RBB 8/7/00 Rev 1

The change will cause one aspect of the SAR to no longer be true in that the SAR states that all SIS components in contact with the radioactive coolant are austenitic stainless steel except for valve seats. Since the entire plug is of the NOREM B1 alloy (not considered an austenitic stainless steel), an LDCR will be processed to effect a change to the SAR. or NOREM 02A RBB 8/7/00 Rev. 1

Answers Form 1000.131B Questions

Question 1 Response: HPSI system component failure is not credited with initiating any of the previously evaluated accidents in the SAR. The valves will remain normally closed and will open in response to a safeguards actuation as before. Replacement of the injection MOV plugs with an updated design does not therefore increase the probability of an accident previously evaluated in the SAR.

Question 2 Response: The replacement valve plugs will provide the same component function as the existing plugs. The change in material and shape of the plugs will also not affect HPSI system functional performance, i.e., flow capacity and isolation capability are unaffected. Therefore, the consequences of an accident previously evaluated in the SAR is not increased.

Question 3 Response: The replacement plugs are constructed to the same Code requirements and ANO design specification as the existing plugs and will serve identical functions. The conditions under which any associated system equipment operates is unchanged. Therefore, the probability of the malfunction of equipment important to safety is not increased.

Question 4 Response: No change in HPSI system configuration or functional capabilities is introduced by this change. The consequence of failure of the new valve plug design is identical to that which would have previously been experienced. Therefore, the consequences of a malfunction of equipment important to safety are unchanged.

Question 5 Response: The change in valve plug design does not affect HPSI system operation or configuration or its interface with other plant systems. It is therefore not credible that an accident of a different type than any previously evaluated in the SAR would be created.

Question 6 Response: No change in HPSI system capabilities or performance is introduced by this change. The new plug design is subject to the same Code requirements and ANO design specification stipulations as the existing plugs and will serve identical functions. No malfunction of equipment important to safety of a different type than previously evaluated in the SAR will be created.

Question 7 Response: The performance capabilities of the HPSI system or any of its components are unaffected by the change of injection MOV plug design. Because the HPSI system and component performance is unaffected, the margin of safety defined in the basis for any technical specification will not be reduced.

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This Document contains 3 Pages.

Document No. ER002357E201 Rev./Change No. 0

Title HPSI Injection Valve Plug Design Change

Brief description of proposed change:

The change is the replacement of the valve plugs in the ANO-2 HPSI injection MOV's, tag #'s 2CV-5015-1/5016-2/5035-1/5036-2/5055-1/5056-2/5075-1/5076-2, with plugs of a different design. The replacement plugs are of a different material and shape than the existing plugs. The plugs are being replaced in order to alleviate scoring problems previously encountered. The change also includes the chamfering of the edges of the valve body outlet port, also to reduce the potential for future scoring.

Will the proposed Activity:

1. Require a change to the Operating License including:

   Technical Specifications (excluding the bases)? Yes☐ No☒

   Operating License? Yes☐ No☒

   Confirmatory Orders? Yes☐ No☒

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:

   SAR (multi-volume set for each unit)? Yes☒ No☐

   Core Operating Limits Report? Yes☐ No☒

   Fire Hazards Analysis? Yes☐ No☒

   Bases of the Technical Specifications? Yes☐ No☒

   Technical Requirements Manual? Yes☐ No☒

   NRC Safety Evaluation Reports? Yes☐ No☒

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒

4. Result in a potential impact to the environment? (Complete Environmental Impact Determination of this form.) Yes☐ No☒

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7?

   QAPM? Yes☐ No☒

   E-Plan? Yes☐ No☒

8. Does this review depend on future NRC approval of other actions? (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No☒

Document No. ER002357E201 Rev./Change No. 0

Basis for Determination (Questions 1, 2, & 3):

Question 1 Response: The HPSI injection valve plug design is not addressed in the operating license and therefore no change is required to the operating license.

Question 2 Response: The HPSI injection valve plug material is addressed in SAR Sections 6.3.2.4 and 6.3.2.19. Specifically, these SAR sections convey that components of the SIS (or materials in contact with radioactive coolant) are fabricated of austenitic stainless steel, and the valve seats are stellite or equivalent material. The entire replacement plugs ~~is~~ are constructed of the NOREM B1 material (i.e., no hardfacing of a different material), which is ~~not~~ considered to be austenitic stainless steel. (, neither of RBS 8/1/00 Rev 1) No other SAR document is affected by this change. (or NOREM 02A RBS 8/1/00 Rev 1) Rev 1

Question 3 Response: No test or experiment not described in the SAR is involved with this change. Post modification testing will consist of existing test activities.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # ___. (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document	Section
LRS:	All (valve, HPSI, high pressure safety Injection, 2CV-5015-1, 2CV-5016-2, 2CV-5035-1, 2CV-5036-2, 2CV-5055-1, 2CV-5056-2, 2CV-5075-1, 2CV-5076-2, stellite, cobalt)
MANUAL SECTIONS:	6.3
FIGURES:	Table 6.3-1, Table 6.3-3, Figure 6.3-2

Stephen J. Lynn — Stephen J. Lynn — 5-22-00
Certified Reviewer's Signature — Printed Name — Date

Reviewer's certification expiration date: 5/26/01

Assistance provided by:

Printed Name	Scope of Assistance	Date
Randall S. Smith	LRS Search	4/14/00

Search ~~Scope~~ Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

S L Chandler — Steve Chandler — 5-25-00
Certified Reviewer's Signature — Printed Name — Date

~~ER002357E201~~ RBS 8/29/00
~~PAGE 6 REV 0~~

ENVIRONMENTAL IMPACT DETERMINATION
(UNIT 1 and UNIT 2)

Document No. ER002357E201 Rev./Change No. 0

Complete the following Determination. If the answer to any item below is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

FORM TITLE: 10CFR50.59 REVISION	FORM NO. 1000.131D	REV. 003-04-0

This Document contains 1 Page.

Document No. ER002357E201 Rev./Change No. 1 10CFR50.59 Eval. No. FFN#00-059

Revision No. 1

This form is to be used to document Revisions to 10CFR50.59 Evaluations. Revisions to a 10CFR50.59 Evaluation after PSC review may become necessary due to SRC review, changes to the original document, etc. Refer to section 6.2.4 of this procedure for additional guidance.

Reason for revision to 10CFR50.59 Evaluation:

ANO has been informed by the supplier that the valve plugs ordered in conjunction with ER002357E201 through E[illegible] are now only available in a material designated as NOREM 02A (NOREM B1 was the previously available [illegible]e material). ER002357E209 has been generated to provide the documentation of equivalency based on inf[illegible]ation provided by the supplier. This revision to the 50.59 evaluation is required due to specific reference in the original evaluation to the new plug material. No change to the response for Questions 1 through 7 is required.

Will the proposed revision result in any additional:

1)	Change to the Operating License?	Yes ☐ No ☒
2)	Change to other Licensing Basis Document?	Yes ☐ No ☒
3)	Conduct of test or experiment?	Yes ☐ No ☒
4)	Impact to the environment?	Yes ☐ No ☒
5)	Need for a Radiological Safety Evaluation?	Yes ☐ No ☒
6)	Impact Ventilated Storage Cask Activities	Yes ☐ No ☒
7)	Impact the QAPM or E-Plan?	Yes ☐ No ☒

If yes, describe below and take appropriate action as per initial Determination:

N/A

Indicate revisions to the 10CFR50.59 Evaluation by placing revision number at the top right hand corner of each page of the form(s). Changes should be lined through, initialed, dated and indicated with the revision number. For extensive changes, new forms may be used with revision bars in the margin denoting changes. Attach this form to front of previous 10CFR50.59 Evaluation. Return to the PSC for review.

Stephen J. Lynn — Certified Reviewer's Signature

Stephen J. Lynn — Printed Name

8-29-00 — Date

Reviewer's certification expiration date: 5/26/01

PSC review: [signature] Date: 9/21/00

Rev. 1

Document No. ER002357E201 Rev./Change No. 0

10CFR50.59 Review Continuation Page

Synopsis of Modification

ER002357E201 replaces the valve plugs of the eight HPSI injection MOV's with an updated design. The existing plug design has exhibited a tendency to become scored when operated during high flow conditions. Once scored, the possibility of galling is heightened. The new plug design differs in two respects from the existing design. The existing stainless steel plug material is replaced with an alloy known as NOREM B1 (also known as NOREM 01). This material, developed by EPRI, is recommended by the valve manufacturer as a replacement plug material for this application. It was developed as a hardfacing material, however, for valve sizes 2" and smaller (the subject valves are 2") the entire plug is constructed of the material. The superior hardness of the new plug material in relation to the stainless steel valve body reduces the possibility of scoring and galling. The new plug design is also shaped differently from the existing plug. The new plug is what is known as a double taper design. Per the valve manufacturer, the Cv of the valve is not changed by the change in plug shape or material. Testing performed by ANO personnel at the Wyle test facilities has confirmed the superior performance offered by the new plug design in terms of resistance to scoring and reduced valve factor. or by NOREM 02A. R&R 8/7/00 Rev 1

Another facet of the change is the chamfering of the edge of the outlet port. The damage seen previously has been concentrated in the outlet port area and is believed to be the result of the plug passing the existing sharp edges of the outlet port and in essence being scraped by that sharp edge.

Finally, the valve bodies will be honed (if needed) prior to installation of the new plugs. This will further reduce the possibility of future scoring.

Post modification testing will include applicable MOV testing, system flow verification and stroke timing. However, if the associated manual valves used for flow balancing are required for isolation or are otherwise disturbed, a workplan to rebalance system flows may be required.

Design Basis

Flow balance of the system is accomplished by throttling of the manual valve associated with each injection MOV. The new plug design will not alter the flow characteristics of the balanced system because the injection MOV's are opened fully and plug shape of the MOV's is not a controlling factor. The NOREM B1 material is compatible with radioactive fluid contact and contains <0.1% by weight of cobalt. This material has been ~~previously~~ evaluated and found acceptable for use at ANO (Reference Specification ANO-M-2456). This change is intended only to replace an existing valve component with a more suitable design. No risk is added by virtue of this modification. R&R 8/7/00 Rev 1 and NOREM 02A R&R 8/7/00 Rev 1

The change will cause one aspect of the SAR to no longer be true in that the SAR states that all SIS components in contact with the radioactive coolant are austenitic stainless steel except for valve seats. Since the entire plug is of the NOREM B1 alloy (not considered an austenitic stainless steel), an LDCR will be processed to effect a change to the SAR. or NOREM 02A R&R 8/7/00 Rev. 1

Answers Form 1000.131B Questions

Question 1 Response: HPSI system component failure is not credited with initiating any of the previously evaluated accidents in the SAR. The valves will remain normally closed and will open in response to a safeguards actuation as before. Replacement of the injection MOV plugs with an updated design does not therefore increase the probability of an accident previously evaluated in the SAR.

Question 2 Response: The replacement valve plugs will provide the same component function as the existing plugs. The change in material and shape of the plugs will also not affect HPSI system functional performance, i.e., flow capacity and isolation capability are unaffected. Therefore, the consequences of an accident previously evaluated in the SAR is not increased.

Question 3 Response: The replacement plugs are constructed to the same Code requirements and ANO design specification as the existing plugs and will serve identical functions. The conditions under which any associated system equipment operates is unchanged. Therefore, the probability of the malfunction of equipment important to safety is not increased.

Question 4 Response: No change in HPSI system configuration or functional capabilities is introduced by this change. The consequence of failure of the new valve plug design is identical to that which would have previously been experienced. Therefore, the consequences of a malfunction of equipment important to safety are unchanged.

Question 5 Response: The change in valve plug design does not affect HPSI system operation or configuration or its interface with other plant systems. It is therefore not credible that an accident of a different type than any previously evaluated in the SAR would be created.

Question 6 Response: No change in HPSI system capabilities or performance is introduced by this change. The new plug design is subject to the same Code requirements and ANO design specification stipulations as the existing plugs and will serve identical functions. No malfunction of equipment important to safety of a different type than previously evaluated in the SAR will be created.

Question 7 Response: The performance capabilities of the HPSI system or any of its components are unaffected by the change of injection MOV plug design. Because the HPSI system and component performance is unaffected, the margin of safety defined in the basis for any technical specification will not be reduced.

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This Document contains 3 Pages.

Document No. ER002357E201 Rev./Change No. 0

Title HPSI Injection Valve Plug Design Change

Brief description of proposed change:

The change is the replacement of the valve plugs in the ANO-2 HPSI injection MOV's, tag #'s 2CV-5015-1/5016-2/5035-1/5036-2/5055-1/5056-2/5075-1/5076-2, with plugs of a different design. The replacement plugs are of a different material and shape than the existing plugs. The plugs are being replaced in order to alleviate scoring problems previously encountered. The change also includes the chamfering of the edges of the valve body outlet port, also to reduce the potential for future scoring.

Will the proposed Activity:

1. Require a change to the Operating License including:

   Technical Specifications (excluding the bases)? Yes☐ No☒

   Operating License? Yes☐ No☒

   Confirmatory Orders? Yes☐ No☒

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:

   SAR (multi-volume set for each unit)? Yes☒ No☐

   Core Operating Limits Report? Yes☐ No☒

   Fire Hazards Analysis? Yes☐ No☒

   Bases of the Technical Specifications? Yes☐ No☒

   Technical Requirements Manual? Yes☐ No☒

   NRC Safety Evaluation Reports? Yes☐ No☒

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒

4. Result in a potential impact to the environment? (Complete Environmental Impact Determination of this form.) Yes☐ No☒

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7?

   QAPM? Yes☐ No☒

   E-Plan? Yes☐ No☒

8. Does this review depend on future NRC approval of other actions? (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No☒

Rev 1

Document No. ER002357E201 Rev./Change No. 0

Basis for Determination (Questions 1, 2, & 3):

Question 1 Response: The HPSI injection valve plug design is not addressed in the operating license and therefore no change is required to the operating license.

Question 2 Response: The HPSI injection valve plug material is addressed in SAR Sections 6.3.2.4 and 6.3.2.19. Specifically, these SAR sections convey that components of the SIS (or materials in contact with radioactive coolant) are fabricated of austenitic stainless steel, and the valve seats are stellite or equivalent material. The entire replacement plug is constructed of the NOREM B1 material (i.e., no hardfacing of a different material) which is ~~not~~ considered to be austenitic stainless steel. No other SAR document is affected by this change.

Rev 1 | neither of R&S 8/1/00 Rev1 | or NOREM 02A Rev1 R&S 8/1/00

Question 3 Response: No test or experiment not described in the SAR is involved with this change. Post modification testing will consist of existing test activities.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # ___. (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document	Section
LRS:	All (valve, HPSI, high pressure safety Injection, 2CV-5015-1, 2CV-5016-2, 2CV-5035-1, 2CV-5036-2, 2CV-5055-1, 2CV-5056-2, 2CV-5075-1, 2CV-5076-2, stellite, cobalt)
MANUAL SECTIONS:	6.3
FIGURES:	Table 6.3-1, Table 6.3-3, Figure 6.3-2

Stephen J. Lynn — Stephen J. Lynn — 5-22-00

Certified Reviewer's Signature | Printed Name | Date

Reviewer's certification expiration date: 5/26/01

Assistance provided by:

Printed Name	Scope of Assistance	Date
Randall S. Smith	LRS Search	4/14/00

Search ~~Scope~~ Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

Steve Chandler — Steve Chandler — 5-25-00

Certified Reviewer's Signature | Printed Name | Date

~~ER002357E201~~ R&S 8/29/00
~~PAGE 6 REV 0~~

ENVIRONMENTAL IMPACT DETERMINATION
(UNIT 1 and UNIT 2)

Document No. ER002357E201 Rev./Change No. 0

Complete the following Determination. If the answer to any item below is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

FORM TITLE:	FORM NO.	REV.
10CFR50.59 REVISION	1000.131D	003-04-0

This Document contains 1 Page.

Document No. ER002357E201 Rev./Change No. 1 10CFR50.59 Eval. No. FFN#00-060

Revision No. 1

This form is to be used to document Revisions to 10CFR50.59 Evaluations. Revisions to a 10CFR50.59 Evaluation after PSC review may become necessary due to SRC review, changes to the original document, etc. Refer to section 6.2.4 of this procedure for additional guidance.

Reason for revision to 10CFR50.59 Evaluation:

ANO has been informed by the supplier that the valve plugs ordered in conjunction with ER002357E201 through E208 are now only available in a material designated as NOREM 02A (NOREM B1 was the previously available hardface material). ER002357E209 has been generated to provide the documentation of equivalency based on information provided by the supplier. This revision to the 50.59 evaluation is required due to specific reference in the original evaluation to the new plug material. No change to the response for Questions 1 through 7 is required.

Will the proposed revision result in any additional:

1)	Change to the Operating License?	Yes ☐ No ☒
2)	Change to other Licensing Basis Document?	Yes ☐ No ☒
3)	Conduct of test or experiment?	Yes ☐ No ☒
4)	Impact to the environment?	Yes ☐ No ☒
5)	Need for a Radiological Safety Evaluation?	Yes ☐ No ☒
6)	Impact Ventilated Storage Cask Activities	Yes ☐ No ☒
7)	Impact the QAPM or E-Plan?	Yes ☐ No ☒

If yes, describe below and take appropriate action as per initial Determination:

N/A

Indicate revisions to the 10CFR50.59 Evaluation by placing revision number at the top right hand corner of each page of the form(s). Changes should be lined through, initialed, dated and indicated with the revision number. For extensive changes, new forms may be used with revision bars in the margin denoting changes. Attach this form to front of previous 10CFR50.59 Evaluation. Return to the PSC for review.

Stephen J. Lynn — Certified Reviewer's Signature

Stephen J. Lynn — Printed Name

8-29-00 — Date

Reviewer's certification expiration date: 5/26/01

PSC review: _____ Date: 9/21/00

Rev. 1

Document No. ER002357E201 Rev./Change No. 0

10CFR50.59 Review Continuation Page

Synopsis of Modification

ER002357E201 replaces the valve plugs of the eight HPSI injection MOV's with an updated design. The existing plug design has exhibited a tendency to become scored when operated during high flow conditions. Once scored, the possibility of galling is heightened. The new plug design differs in two respects from the existing design. The existing stainless steel plug material is replaced with an alloy known as NOREM B1 (also known as NOREM 01). This material, developed by EPRI, is recommended by the valve manufacturer as a replacement plug material for this application. It was developed as a hardfacing material, however, for valve sizes 2" and smaller (the subject valves are 2") the entire plug is constructed of the material. The superior hardness of the new plug material in relation to the stainless steel valve body reduces the possibility of scoring and galling. The new plug design is also shaped differently from the existing plug. The new plug is what is known as a double taper design. Per the valve manufacturer, the Cv of the valve is not changed by the change in plug shape or material. Testing performed by ANO personnel at the Wyle test facilities has confirmed the superior performance offered by the new plug design in terms of resistance to scoring and reduced valve factor. or by NOREM 02A. R&S 8/7/00 Rev 1

Another facet of the change is the chamfering of the edge of the outlet port. The damage seen previously has been concentrated in the outlet port area and is believed to be the result of the plug passing the existing sharp edges of the outlet port and in essence being scraped by that sharp edge.

Finally, the valve bodies will be honed (if needed) prior to installation of the new plugs. This will further reduce the possibility of future scoring.

Post modification testing will include applicable MOV testing, system flow verification and stroke timing. However, if the associated manual valves used for flow balancing are required for isolation or are otherwise disturbed, a workplan to rebalance system flows may be required.

Design Basis

R&S 8/7/00 Rev 1 and NOREM 02A

Flow balance of the system is accomplished by throttling of the manual valve associated with each injection MOV. The new plug design will not alter the flow characteristics of the balanced system because the injection MOV's are opened fully and plug shape of the MOV's is not a controlling factor. The NOREM B1 material is compatible with radioactive fluid contact and contains <0.1% by weight of cobalt. This material has been ~~previously~~ R&S 8/7/00 Rev.1 evaluated and found acceptable for use at ANO (Reference Specification ANO-M-2456). This change is intended only to replace an existing valve component with a more suitable design. No risk is added by virtue of this modification.

The change will cause one aspect of the SAR to no longer be true in that the SAR states that all SIS components in contact with the radioactive coolant are austenitic stainless steel except for valve seats. Since the entire plug is of the NOREM B1 alloy (not considered an austenitic stainless steel), an LDCR will be processed to effect a change to the SAR. or NOREM 02A R&S 8/7/00 Rev.1

Answers Form 1000.131B Questions

Question 1 Response: HPSI system component failure is not credited with initiating any of the previously evaluated accidents in the SAR. The valves will remain normally closed and will open in response to a safeguards actuation as before. Replacement of the injection MOV plugs with an updated design does not therefore increase the probability of an accident previously evaluated in the SAR.

Question 2 Response: The replacement valve plugs will provide the same component function as the existing plugs. The change in material and shape of the plugs will also not affect HPSI system functional performance, i.e., flow capacity and isolation capability are unaffected. Therefore, the consequences of an accident previously evaluated in the SAR is not increased.

Question 3 Response: The replacement plugs are constructed to the same Code requirements and ANO design specification as the existing plugs and will serve identical functions. The conditions under which any associated system equipment operates is unchanged. Therefore, the probability of the malfunction of equipment important to safety is not increased.

Question 4 Response: No change in HPSI system configuration or functional capabilities is introduced by this change. The consequence of failure of the new valve plug design is identical to that which would have previously been experienced. Therefore, the consequences of a malfunction of equipment important to safety are unchanged.

Question 5 Response: The change in valve plug design does not affect HPSI system operation or configuration or its interface with other plant systems. It is therefore not credible that an accident of a different type than any previously evaluated in the SAR would be created.

Question 6 Response: No change in HPSI system capabilities or performance is introduced by this change. The new plug design is subject to the same Code requirements and ANO design specification stipulations as the existing plugs and will serve identical functions. No malfunction of equipment important to safety of a different type than previously evaluated in the SAR will be created.

Question 7 Response: The performance capabilities of the HPSI system or any of its components are unaffected by the change of injection MOV plug design. Because the HPSI system and component performance is unaffected, the margin of safety defined in the basis for any technical specification will not be reduced.

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FORM TITLE: 10CFR50.59 DETERMINATION	FORM NO. 1000.131A	REV. 003-04-0

This Document contains 3 Pages.

Document No. ER002357E201 Rev./Change No. 0

Title HPSI Injection Valve Plug Design Change

Brief description of proposed change:

The change is the replacement of the valve plugs in the ANO-2 HPSI injection MOV's, tag #'s 2CV-5015-1/5016-2/5035-1/5036-2/5055-1/5056-2/5075-1/5076-2, with plugs of a different design. The replacement plugs are of a different material and shape than the existing plugs. The plugs are being replaced in order to alleviate scoring problems previously encountered. The change also includes the chamfering of the edges of the valve body outlet port, also to reduce the potential for future scoring.

Will the proposed Activity:

1. Require a change to the Operating License including:

   Technical Specifications (excluding the bases)? Yes☐ No☒

   Operating License? Yes☐ No☒

   Confirmatory Orders? Yes☐ No☒

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:

   SAR (multi-volume set for each unit)? Yes☒ No☐

   Core Operating Limits Report? Yes☐ No☒

   Fire Hazards Analysis? Yes☐ No☒

   Bases of the Technical Specifications? Yes☐ No☒

   Technical Requirements Manual? Yes☐ No☒

   NRC Safety Evaluation Reports? Yes☐ No☒

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒

4. Result in a potential impact to the environment? (Complete Environmental Impact Determination of this form.) Yes☐ No☒

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7?

   QAPM? Yes☐ No☒

   E-Plan? Yes☐ No☒

8. Does this review depend on future NRC approval of other actions? (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No☒

FORM TITLE: 10CFR50.59 DETERMINATION	FORM NO. 1000.131A	REV. 003-04-0

Rev 1

Document No. ER002357E201 Rev./Change No. 0

Basis for Determination (Questions 1, 2, & 3):

Question 1 Response: The HPSI injection valve plug design is not addressed in the operating license and therefore no change is required to the operating license.

Question 2 Response: The HPSI injection valve plug material is addressed in SAR Sections 6.3.2.4 and 6.3.2.19. Specifically, these SAR sections convey that components of the SIS (or materials in contact with radioactive coolant) are fabricated of austenitic stainless steel, and the valve seats are stellite or equivalent material. The entire replacement plugs ~~is~~ are constructed of the NOREM B1 material (i.e., no hardfacing of a different material), which is ~~not~~ considered to be austenitic stainless steel. No other SAR document is affected by this change. (Rev 1) (, neither of RBS 8/1/00 Rev1) (or NOREM 02A RBS 8/1/00 Rev1)

Question 3 Response: No test or experiment not described in the SAR is involved with this change. Post modification testing will consist of existing test activities.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # ___ (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document	Section
LRS:	All (valve, HPSI, high pressure safety Injection, 2CV-5015-1, 2CV-5016-2, 2CV-5035-1, 2CV-5036-2, 2CV-5055-1, 2CV-5056-2, 2CV-5075-1, 2CV-5076-2, stellite, cobalt)
MANUAL SECTIONS:	6.3
FIGURES:	Table 6.3-1, Table 6.3-3, Figure 6.3-2

Stephen J. Lynn — Stephen J. Lynn — 5-22-00
Certified Reviewer's Signature — Printed Name — Date

Reviewer's certification expiration date: 5/26/01

Assistance provided by:

Printed Name	Scope of Assistance	Date
Randall S. Smith	LRS Search	4/14/00

Search Scope Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

S. Chandler — Steve Chandler — 5-25-00
Certified Reviewer's Signature — Printed Name — Date

~~ER 002357E201~~ RBS 8/29/00
~~PAGE 6 REV 0~~

ENVIRONMENTAL IMPACT DETERMINATION
(UNIT 1 and UNIT 2)

Document No. ER002357E201 Rev./Change No. 0

Complete the following Determination. If the answer to any item below is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

FORM TITLE: 10CFR50.59 REVISION	FORM NO. 1000.131D	REV. 003-04-0

This Document contains 1 Page.

Document No. ER002357E201 Rev./Change No. 1 10CFR50.59 Eval. No. FFN#00-061

Revision No. 1

This form is to be used to document Revisions to 10CFR50.59 Evaluations. Revisions to a 10CFR50.59 Evaluation after PSC review may become necessary due to SRC review, changes to the original document, etc. Refer to section 6.2.4 of this procedure for additional guidance.

Reason for revision to 10CFR50.59 Evaluation:

ANO has been informed by the supplier that the valve plugs ordered in conjunction with ER002357E201 through E208 are now only available in a material designated as NOREM 02A (NOREM B1 was the previously available hardface material). ER002357E209 has been generated to provide the documentation of equivalency based on information provided by the supplier. This revision to the 50.59 evaluation is required due to specific reference in the original evaluation to the new plug material. No change to the response for Questions 1 through 7 is required.

Will the proposed revision result in any additional:

1)	Change to the Operating License?	Yes ☐ No ☒
2)	Change to other Licensing Basis Document?	Yes ☐ No ☒
3)	Conduct of test or experiment?	Yes ☐ No ☒
4)	Impact to the environment?	Yes ☐ No ☒
5)	Need for a Radiological Safety Evaluation?	Yes ☐ No ☒
6)	Impact Ventilated Storage Cask Activities	Yes ☐ No ☒
7)	Impact the QAPM or E-Plan?	Yes ☐ No ☒

If yes, describe below and take appropriate action as per initial Determination:

N/A

Indicate revisions to the 10CFR50.59 Evaluation by placing revision number at the top right hand corner of each page of the form(s). Changes should be lined through, initialed, dated and indicated with the revision number. For extensive changes, new forms may be used with revision bars in the margin denoting changes. Attach this form to front of previous 10CFR50.59 Evaluation. Return to the PSC for review.

Stephen J. Lynn — Certified Reviewer's Signature

Stephen J. Lynn — Printed Name

8-29-00 — Date

Reviewer's certification expiration date: 5/26/01

PSC review: [signature] Date: 9/21/00

ER002357E206
PAGE 8 REV 1

Rev. 1

Document No. ER002357E201 Rev./Change No. 0

10CFR50.59 Review Continuation Page

Synopsis of Modification

ER002357E201 replaces the valve plugs of the eight HPSI injection MOV's with an updated design. The existing plug design has exhibited a tendency to become scored when operated during high flow conditions. Once scored, the possibility of galling is heightened. The new plug design differs in two respects from the existing design. The existing stainless steel plug material is replaced with an alloy known as NOREM B1 (also known as NOREM 01). This material, developed by EPRI, is recommended by the valve manufacturer as a replacement plug material for this application. It was developed as a hardfacing material, however, for valve sizes 2" and smaller (the subject valves are 2") the entire plug is constructed of the material. The superior hardness of the new plug material in relation to the stainless steel valve body reduces the possibility of scoring and galling. The new plug design is also shaped differently from the existing plug. The new plug is what is known as a double taper design. Per the valve manufacturer, the Cv of the valve is not changed by the change in plug shape or material. Testing performed by ANO personnel at the Wyle test facilities has confirmed the superior performance offered by the new plug design in terms of resistance to scoring and reduced valve factor. or by NOREM 02A. R&R 8/7/00 Rev 1

Another facet of the change is the chamfering of the edge of the outlet port. The damage seen previously has been concentrated in the outlet port area and is believed to be the result of the plug passing the existing sharp edges of the outlet port and in essence being scraped by that sharp edge.

Finally, the valve bodies will be honed (if needed) prior to installation of the new plugs. This will further reduce the possibility of future scoring.

Post modification testing will include applicable MOV testing, system flow verification and stroke timing. However, if the associated manual valves used for flow balancing are required for isolation or are otherwise disturbed, a workplan to rebalance system flows may be required.

Design Basis

R&R 8/7/00 Rev 1 and NOREM 02A

Flow balance of the system is accomplished by throttling of the manual valve associated with each injection MOV. The new plug design will not alter the flow characteristics of the balanced system because the injection MOV's are opened fully and plug shape of the MOV's is not a controlling factor. The NOREM B1 material is compatible with radioactive fluid contact and contains <0.1% by weight of cobalt. This material has been ~~previously~~ R&R 8/7/00 Rev. 1 evaluated and found acceptable for use at ANO (Reference Specification ANO-M-2456). This change is intended only to replace an existing valve component with a more suitable design. No risk is added by virtue of this modification.

The change will cause one aspect of the SAR to no longer be true in that the SAR states that all SIS components in contact with the radioactive coolant are austenitic stainless steel except for valve seats. Since the entire plug is of the NOREM B1 alloy (not considered an austenitic stainless steel), an LDCR will be processed to effect a change to the SAR. or NOREM 02A R&R 8/7/00 Rev. 1

Answers Form 1000.131B Questions

Question 1 Response: HPSI system component failure is not credited with initiating any of the previously evaluated accidents in the SAR. The valves will remain normally closed and will open in response to a safeguards actuation as before. Replacement of the injection MOV plugs with an updated design does not therefore increase the probability of an accident previously evaluated in the SAR.

Question 2 Response: The replacement valve plugs will provide the same component function as the existing plugs. The change in material and shape of the plugs will also not affect HPSI system functional performance, i.e., flow capacity and isolation capability are unaffected. Therefore, the consequences of an accident previously evaluated in the SAR is not increased.

Question 3 Response: The replacement plugs are constructed to the same Code requirements and ANO design specification as the existing plugs and will serve identical functions. The conditions under which any associated system equipment operates is unchanged. Therefore, the probability of the malfunction of equipment important to safety is not increased.

Question 4 Response: No change in HPSI system configuration or functional capabilities is introduced by this change. The consequence of failure of the new valve plug design is identical to that which would have previously been experienced. Therefore, the consequences of a malfunction of equipment important to safety are unchanged.

Question 5 Response: The change in valve plug design does not affect HPSI system operation or configuration or its interface with other plant systems. It is therefore not credible that an accident of a different type than any previously evaluated in the SAR would be created.

Question 6 Response: No change in HPSI system capabilities or performance is introduced by this change. The new plug design is subject to the same Code requirements and ANO design specification stipulations as the existing plugs and will serve identical functions. No malfunction of equipment important to safety of a different type than previously evaluated in the SAR will be created.

Question 7 Response: The performance capabilities of the HPSI system or any of its components are unaffected by the change of injection MOV plug design. Because the HPSI system and component performance is unaffected, the margin of safety defined in the basis for any technical specification will not be reduced.

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FORM TITLE: 10CFR50.59 DETERMINATION	FORM NO. 1000.131A	REV. 003-04-0

This Document contains 3 Pages.

Document No. ER2686E201 Rev./Change No. _____

Title Installing caps on the Safety Injection Tank Vents, T-ALT 00-2-008

Brief description of proposed change:

Condition Report CR-2-99-0761 documents installation of caps on the Safety Injection Tank (SIT) vent lines. Per CA-8, this configuration is a Temp Alt. T-Alt 00-2-008 was generated for installing caps on the SIT vents. ER2686 was developed to provide supporting documents for the T-ALT.

Will the proposed Activity:

1. Require a change to the Operating License including:

Technical Specifications (excluding the bases)?	Yes☐ No X
Operating License?	Yes☐ No X
Confirmatory Orders?	Yes☐ No X

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:

SAR (multi-volume set for each unit)?	Yes X No☐
Core Operating Limits Report?	Yes☐ No X
Fire Hazards Analysis?	Yes☐ No X
Bases of the Technical Specifications?	Yes☐ No X
Technical Requirements Manual?	Yes☐ No X
NRC Safety Evaluation Reports?	Yes☐ No X

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No X

4. Result in a potential impact to the environment? (Complete Environmental Impact Determination of this form.) Yes☐ No X

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No X

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No X

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7?

QAPM?	Yes☐ No X
E-Plan?	Yes☐ No X

8. Does this review depend on future NRC approval of other actions? (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No X

Document No. ER002686E201 Rev./Change No. _____

Basis for Determination (Questions 1, 2, & 3):

Q1. Neither the TS Bases, nor the Operating License discuss venting the SITS. There are no confirmatory orders for the SITS vents.
Q2. A search was done on LRS of the documents listed in Q2 and the only change will be to the SAR. Figure 6.3-2 will need to be changed to show that the caps can be either installed or removed.
Q3. This ER does not create a test. A search was done on LRS of the documents listed in Q2, which includes the SAR, and no tests were identified related to this ER. Attachment 2 was used for guidance.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # ___, (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document Section

LRS: Searched on SIT, 2SV-5006, 2SV-5026, 2SV-5046, 2SV-5066, Vent and Safety Injection Tank.

MANUAL SECTIONS: All SAR Figures

FIGURES: All

Certified Reviewer's Signature	Keith Perkins Printed Name	7-29-2000 Date

Reviewer's certification expiration date: 7-31-2001

Assistance provided by:

Printed Name	Scope of Assistance	Date

Search Scope Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

Certified Reviewer's Signature	Bill Greeson Printed Name	7-30-00 Date

ENVIRONMENTAL IMPACT DETERMINATION
(UNIT 1 and UNIT 2)

Document No. ER002686E201 Rev./Change No. _____

Complete the following Determination. If the answer to any item below is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	X	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	X	Increase thermal discharges to lake or atmosphere?
☐	X	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	X	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	X	Modify the design or operation of cooling tower which will change drift characteristics?
☐	X	Install any new transmission lines leading offsite?
☐	X	Change the design or operation of the intake or discharge structures?
☐	X	Discharges any chemicals new or different from that previously discharged?
☐	X	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	X	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	X	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	X	Result in a change to nonradiological effluents or licensed reactor power level?
☐	X	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

FORM TITLE: 10CFR50.59 SAFETY EVALUATION	FORM NO. 1000.131B	REV. 003-04-0

This Document contains 1 Page.

Document No. ER002686E201 Rev./Change No. _____ 10CFR50.59 Eval. No. FFN#00-082 (Assigned by PSC)

Title Installing Caps on SIT Vents

A WRITTEN RESPONSE PROVIDING THE BASIS FOR THE ANSWER TO EACH QUESTION MUST BE ATTACHED. EACH QUESTION MUST BE ANSWERED SEPARATELY. A SIMPLE STATEMENT OF CONCLUSION IS NOT SUFFICIENT. ATTACHMENT 2 PROVIDES GUIDANCE FOR RESPONSE.

If the answer to any question on this form is "Yes," then an unreviewed safety question is involved. If the answer to all questions is "No," then the proposed change does not involve an unreviewed safety question.

1. Will the probability of an accident previously evaluated in the SAR be increased? Yes ☐ No X
2. Will the consequences of an accident previously evaluated in the SAR be increased? Yes ☐ No X
3. Will the probability of a malfunction of equipment important to safety be increased? Yes ☐ No X
4. Will the consequences of a malfunction of equipment important to safety be increased? Yes ☐ No X
5. Will the possibility of an accident of a different type than any previously evaluated in the SAR be created? Yes ☐ No X
6. Will the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR be created? Yes ☐ No X
7. Will the margin of safety as defined in the basis for any technical specification be reduced? Yes ☐ No X

Certified Reviewer's Signature	Keith Perkins Printed Name	7-29-2000 Date

Reviewer's certification expiration date: 7-31-2001

Assistance provided by:

Printed Name	Scope of Assistance	Date

PSC review by: _____ Date: 8/3/00

10CFR50.59 Safety Evaluation for ER002686E201 / T-ALT 00-2-008
Questions and written answers

Question 1. Will the probability of an accident previously evaluated in the SAR be increased?

The answer is NO.

The SAR does not credit the SIT vent valves as an accident initiator. Therefore, capping the vent line down stream of a SIT vent valve does not add a multiplier to the probabilities for analyzed accidents. Therefore, the probability of an accident is not increased.

Question 2. Will the consequences of an accident previously evaluated in the SAR be increased?

The answer is NO.

Capping a vent line will not prevent a SIT from performing its function. The SIT will still re-flood the core as designed. Since each SIT will perform its function, core damage evaluations for evaluated accidents will not be increased. Since core damage is not increased, the consequences (offsite release) of an accident are not increased.

The vents can be used to reduce SIT pressure during the cool-down and depressurization phases of a small break LOCA. This prevents the SITs from "dumping" into the RCS. This can also be accomplished by closing the SIT outlet MOV. The EOPs have steps instructing Operations to close the SIT outlet MOVs when RCS pressure is less than 700 psia. Those EOP steps have a contingency that prevents Operations from lowering RCS pressure below 230 psia in the event the SIT can not be isolated or vented. This requirement comes from CALC-91-EQ-2001-02, which shows that SIT Nitrogen will not enter the RCS if RCS pressure is maintained above 227 psia. The EOPs currently list this method of SIT isolation. Both methods obtain the same result. This does not prevent delay of cool down of the RCS because shutdown cooling (SDC) entry conditions can be met. Once SDC is conditions are met SDC will be placed in service and the S/G will not be required for decay heat removal. RCS pressure will be maintained above 230 psia until the SITs can be depressurized. Procedure 2104.001, "SIT OPS", provides three methods for depressurizing the SIT. One method utilizes the SIT vents another method utilizes the SIT N2 add valves and the third method uses the SIT drain to the RWT. SIT drain to the RWT requires off site power.

The following tables list the power supplies to each of the SIT drain, vent, sample and Nitrogen make-up valves. As can be seen by the table, the power supplies are diverse.

The Vent and N2 add valves are powered from 2D21 which is available during lose of off-site power and an EDG. Operator action can be used open a vent path for use of these valves per 2104.001. The drain valves are powered from red DC but the drains to the RWT and RDT require off-site power of ACC diesel power to operate.

The SIT OPS procedure does not list SIT sample as a means to depressurize a SIT. Approved procedures are in place for sampling a SIT, they have not been specifically applied for the purposes of depressurizing a SIT. It has been listed here because, if needed, the procedure could be changed to provide that option. Once the procedure change is made it would provide another means for OPS to depressurize the SIT with additional power supply options. The SIT sample valves will be powered from either off-site or from an EDG or DC. They are powered from an inverter. The containment isolation valve for the SIT sample is powered from Red DC.
As can be seen, there are numerous possibilities for the contingency of failure of a SIT outlet MOV.

Valve	Description	Handswitch	Power
2SV-5006	2T-2A Vent	2HS-5006 on 2C-33	2D21-04 (2C-33 Fuse 6 & 6A)
2SV-5026	2T-2B Vent	2HS-5026 on 2C-33	2D21-04 (2C-33 Fuse 6 & 6A)
2SV-5046	2T-2C Vent	2HS-5046 on 2C-33	2D21-04 (2C-33 Fuse 7 & 7A)
2SV-5066	2T-2D Vent	2HS-5066 on 2C-33	2D21-04 (2C-33 Fuse 7 & 7A)

Valve	Description	Handswitch	Power
2SV-5001-1	2T-2A N2 Drain	2HS-5001 on 2C-17	2D23-01 2C-17 Fuse 22 & 23
2SV-5021-1	2T-2B N2 Drain	2HS-5021 on 2C-17	2D23-01 2C-17 Fuse 22 & 23
2SV-5041-2	2T-2C N2 Drain	2HS-5041 on 2C-16	2D24-01 2C-16 Fuse 5 & 6 .
2SV-5061-2b	2T-2D N2 Drain	2HS-5061 on 2C-16	2D24-01 2C-16 Fuse 5 & 6.

Valve	Description	Handswitch	Power
2SV-5005A/B	2T-2A N2 Add	2HS-5005 on 2C-33	2D21-04 (2C-33 Fuse 6 & 6A)
2SV-5025A/B	2T-2B N2 Add	2HS-5025 on 2C-33	2D21-04 (2C-33 Fuse 6 & 6A)
2SV-5045A/B	2T-2C N2 Add	2HS-5045 on 2C-33	2D21-04 (2C-33 Fuse 7 & 7A)
2SV-5065A/b	2T-2D N2 Add	2HS-5065 on 2C-33	2D21-04 (2C-33 Fuse 7 & 7A)

Valve	Description	Handswitch	Power
2CV-5081	SIT drain to RDT	2HS-5081 on 2C-33	2B71-E2
2CV-5082	SIT drain to RWT	2HS-5082 on 2C-33	2B71-E3

Valve	Description	Handswitch	Power
2SV-5872	"A" SIT Penetration Sample Isolation	2HS-5872 on 2C-116	2Y2-30
2SV-5873	"B" SIT Penetration Sample Isolation	2HS-5873 on 2C-116	2Y2-30
2SV-5874	"C" SIT Penetration Sample Isolation	2HS-5874 on 2C-116	2Y2-30
2SV-5875	"D" SIT Penetration Sample Isolation	2HS-5875 on 2C-116	2Y2-30
2SV-5876	SIT Master Sample Isolation	2HS-5876-2 on 2C-16	2D24-01

Generic Letter 91-18 was reviewed for its impact on this safety evaluation and the T-ALT. Per GL 91-18 this condition is a nonconforming condition. Per GL 91-18 the compensatory action its-self must be evaluated to determine if the actions can be taken with in a "reasonable time frame". Since the procedure approved methods listed above do not delay cool down and entry into shutdown cooling, and since depressurization of the RCS can be achieved to reduce SBLOCA leakage, these compensatory actions meet the NRC's evaluation criteria as being within a "reasonable time frame". If necessary a reactor building entry could be make with a days time to vent the SITs. Based on the above discussions, capping the vent lines will not increase the consequences of an accident.

Question 3. Will the probability of a malfunction of equipment important to safety be increased?

The answer is NO.

Capping the vent lines does not interact with plant equipment other than the SIT vents. Installation of the caps will not increase the probability of malfunction of the vents.
The caps will actually reduce the probability of malfunction of the SIT. One component of the probability of SIT failure is inadvertently opening a vent. This would reduce SIT pressure and make the SIT inoperable. By capping the vents this failure mechanism is eliminated which reduces the probability of malfunction of equipment important to safety.

Question 4. Will the consequences of a malfunction of equipment important to safety be increased?

The answer is NO.

The capability of the vent lines to vent the SIT is not important to nuclear safety. The capability of the vent valves to maintain N2 gas pressure in the SIT is important to nuclear safety. Capping the vent lines will actually reduce the consequences of a malfunction of the SIT vent valve by preventing the SIT from becoming inoperable due to inadequate over pressure.
Capping the vents will not create a condition such that other components can be affected. The SITs and all other equipment will still perform their design functions. Therefore, the consequences of equipment malfunction will not be increased.

Question 5. Will the possibility of an accident of a different type than previously evaluated in the SAR be created?

The answer is No.

Installation of the caps will not create the potential for a new or different type of accident. All needed aspects of SIT isolation can be accomplished without the use of the vents as discussed in question 2 above. There is no accident that can be initiated by installing the caps on the SIT vents.

Question 6. Will the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR be created?

The answer is NO.

The caps will not impact the operation of equipment other than the SIT and SIT vents. The impact of the SIT system has been evaluated in the SAR therefore; installation of the caps will not create a different type of malfunction that requires evaluation.

Question 7 Will the margin of safety as defined in the bases for any Technical Specification be reduced?

The answer is No.

The Tech Specs Bases do not discuss the use of SIT vents or any actions that require caps on the vent line. Therefore, the margin of safety is not reduced in Tech Spec bases.

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ARKANSAS NUCLEAR ONE		
FORM TITLE: 10CFR50.59 DETERMINATION	FORM NO. 1000.131A	REV. 003-04-0

ER3864E3D1

This Document contains 3 Pages.

Document No. **Specification ANO-M-2243** Rev./Change No. **0**

Title **Ventilation Filters for Unit 2**

Brief description of proposed change: Revised specification 6600-M-2243 in response to CR-C-1998-0177. Some of the codes and standards that the medium efficiency roughing filters and the high efficiency particulate air, HEPA, filters were originally specified and supplied to have been superceded and or replaced by more current codes and standards. Specification ANO-M-2243 Revision 0 revises 6600-M-2243 Rev. 8 and provides the requirements for purchasing of the medium efficiency roughing filters and HEPA filters for the Aux. Bld. Radwaste Area Exh. Sys., Cont. Purge Exh. Sys., Fuel Handling Radwaste Area Exh. Sys., and Aux. Bld. Ext. Radwaste Area Exh. Sys. to current new and or revised codes and standards by the addition of Attachment 1. The changes in the revised specification do not add to or change the function of the installed filter components being addressed.

Will the proposed Activity:

1. Require a change to the Operating License including:
   - Technical Specifications (excluding the bases)? Yes☐ No☒
   - Operating License? Yes☐ No☒
   - Confirmatory Orders? Yes☐ No☒

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:
   - SAR (multi-volume set for each unit)? Yes☒ No☐
   - Core Operating Limits Report Yes☐ No☒
   - Fire Hazards Analysis? Yes☐ No☒
   - Bases of the Technical Specifications? Yes☐ No☒
   - Technical Requirements Manual? Yes☐ No☒
   - NRC Safety Evaluation Reports? Yes☐ No☒

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒

4. Result in a potential impact to the environment? (Complete the Environmental Impact Determination of this form.) Yes☐ No☒

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7:
   - QAPM? Yes☐ No☒
   - E-Plan? Yes☐ No☒

8. Does this review depend on future NRC approval of other actions (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No☒

Document No. **Specification ANO-M-2243** Rev./Change No. **0**

Basis for Determination (Questions 1, 2 & 3):

1.The Ops. Lic. Docs. Reviewed were found not to be prescriptive in sufficient detail concerning the changes in the revised specification and therefore these documents will not impacted.
2.The SAR (multi-volume set) was found to contain sufficient detail concerning filters that revision to certain sections (9.4.3.1, 9.4.3.2.3, 9.4.5.2, Table 9.4-3 and 12.2.2.2) by LDCR will be required. The remaining SAR documents were found not to be prescriptive in sufficient detail concerning the changes in the revised specification and therefore these documents will not impacted.
3.The changes in the revised specification address requirements for the purchase and supply of replacement medium efficiency roughing filters and HEPA filters for installation into filter banks and does not involve any test or experiments not described in the SAR and does not authorize any equipment operation outside of approved procedures.

☐ Proposed change does not require 10 CFR 50.59 Evaluation per Attachment 1, Item #_____, (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:
List sections reviewed in the Licensing Basis Documents specified in Question 1, 2 and 3. If a search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document	Section
LRS:	LRS search index 50.59 Unit 2: (Guide 1.25), (Guide 1.52), (cask w/5 drop), (fuel w/5 drop), (fuel w/5 accident), (fuel w/5 exhaust), (Fuel w/5 ventilation), (criterion 60), (criterion 61), (fuel handling ventilation), (hepa filter), (prefilter),(roughing filter), (fuel w/10 accident), (containment w/5 accident), (containment w/5 exhaust), (containment w/5 purge), (radwaste w/5 exhaust), (radwaste w/5 ventilation), (auxiliary w/5 ventilation), (auxiliary w/5 exhaust), (auxiliary w/10 extension), (extension w/10 exhaust), (extension w/10 ventilation), (2VEF-8), (2VFP-10), (2VFA- 2), (2VEF-14), (2VFP-8), (2VFA-1), (2VEF-15), (2VFP-3), (2VFA- 4), (2VEF-51), (2VFP-33), (2VFA- 9)
MANUAL SECTIONS:	
ANO Unit 2 SAR	3.1, 6.2.3, 6.5, 9.1.4.2.10, 9.4, 11.2, 11.3, 11.4.2.2, 12.2, 15.1, Table 9.4-3, Table 15.1.23-1, 15.1.23-2
Tech Specs Unit 2	3.9.11, 4.9.11, Bases 3/4.9.11, 3.9.4, 4.9.4, Bases 3/4.9.4
FIGURES:	
ANO Unit 2 SAR	9.4-1, 9.4-2, 10.4-2

David N. Hamblen — Certified Reviewer's Signature
David N. Hamblen — Printed Name
08/23/00 — Date
Reviewer's certification expiration date: 06/08/01

Assistance provided by:

Printed Name	Scope of Assistance	Date
N/A		

Search Scope Review Acceptability (NA, if performed by Technical Review per 1000.006)

William E. Rogers — Certified Reviewer's Signature
WILLIAM E. ROGERS — Printed Name
8/29/00 — Date

ENVIRONMENTAL IMPACT DETERMINATION (UNIT 1 and UNIT 2)

Document No. **Specification ANO-M-2243** Rev./Change No. **0**

Complete the following Determination. If the answer to any checklist item is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

ARKANSAS NUCLEAR ONE		
FORM TITLE: 10CFR50.59 EVALUATION	FORM NO. 1000.131B	REV. 003-04-0

This Document contains 3 Pages.

10CFR50.59 Eval. No. EFN# 00-114
(Assigned by PSC)

Document No. **ANO-M-2243** Rev./Change No. **0**

Title **Arkansas Nuclear One Procurement Specification Ventilation Filter Units for Unit 2**

A WRITTEN RESPONSE PROVIDING THE BASIS FOR THE ANSWER TO EACH QUESTION MUST BE ATTACHED. EACH QUESTION MUST BE ANSWERED SEPARATELY. A SIMPLE STATEMENT OF CONCLUSION IS NOT SUFFICIENT. ATTACHMENT 2 PROVIDES GUIDANCE FOR RESPONSE.

If the answer to any question on this form is "Yes," then an unreviewed safety question is involved. If the answer to all questions is "No," then the proposed change does not involve an unreviewed safety question.

1. Will the probability of an accident previously evaluated in the SAR be increased? Yes ☐ No ☒

Will the consequences of an accident previously evaluated in the SAR be increased? Yes ☐ No ☒

3. Will the probability of a malfunction of equipment important to safety be increased? Yes ☐ No ☒

4. Will the consequences of a malfunction of equipment important to safety be increased? Yes ☐ No ☒

5. Will the possibility of an accident of a different type than any previously evaluated in the SAR be created? Yes ☐ No ☒

6. Will the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR be created? Yes ☐ No ☒

7. Will the margin of safety as defined in the basis for any technical specification be reduced? Yes ☐ No ☒

David N. Hamblen — **David N. Hamblen** — **8/23/00**
Certified Reviewer's Signature — Printed Name — Date

Reviewer's certification expiration date: **06/08/01**

Assistance provided by:

Printed Name	Scope of Assistance	Date
N/A		

PSC review by: R V Fuller Date: 9-28-00

10CFR50.59 Evaluation Continuation Page for Safety Evaluation Question Answers

1. The changes provided in this specification will not impact any accidents analyzed in the SAR and therefore will not increase the probability of an accident. The medium efficiency roughing filters are not addressed in section 15.0 of the 2SAR however HEPA, filters, and filtration are mentioned in numerous places in the section that apply to the exhaust systems being addressed in this evaluation. The subject exhaust systems are referenced directly or implied in this accident sections to include 15.1.5.2.1.2 concerning filtering of condenser hotwell gases in conjunction with an RCP shaft seizure, 15.1.13.4 post accident leakage, 15.1.18 steam generator tube rupture, 15.1.23 fuel handling accidents to inside containment or in the auxiliary building and a cask drop, 15.1.24 small spills outside containment, and etc. These exhaust system filters perform a mitigation of consequence role in the reduction of offsite release of radioactive particulate and gases during the postulated accidents. The particulate removal efficiencies of these medium efficiency roughing filters and HEPA filters are, as specified in the applicable sections of 2SAR, not being reduced therefore, there will be no reduction in particulate capture and thus no affect on the quality of the filtered air stream flowing to the downstream associated charcoal adsorber and no reduction in the required iodine removal efficiencies for inorganic species and organic species of the charcoal adsorber. Fuel Handling Floor and Auxiliary Building Radwaste Area Exhaust Systems descriptions are in 2SAR 9.4.3.2.3 and the Containment Purge Exhaust System is described in 2SAR 9.4.5.2. The Auxiliary Building Extension Radwaste Area Exhaust System is not mentioned in any detail in the 2SAR.

2. The changes provided in this specification will not affect the function or operation of any components or systems used to mitigate a postulated accident. The filtering efficiencies as they relate to size of particle captured by the medium efficiency roughing filters and the HEPA filters are not being reduced and therefore the air stream being passed on to the charcoal adsorber will not affect the removal efficiencies for iodine and therefore radiation dose to the public or the on site dose is not being increased. This is to say that the particulate filtration achieved by the medium efficiency roughing filter and HEPA filter will remain unchanged as it relates to the cleanliness of the air stream being passed on to the charcoal adsorber.

3. The changes provided in this specification will not degrade the performance of equipment important to safety and cause a higher probability of malfunction. The exhaust systems affected are not safety related and have no safety function however, as discussed in 1 above, credit is taken for this equipment for offsite dose for some accidents in 2SAR 15.0 and therefore it is important to maintain the equipment design basis and assure that replacement filters are appropriate for the service and efficiency requirements. The changes in the specification will result in the medium efficiency roughing filter and HEPA filter being designed and constructed to equivalent codes, standards, and current revisions consistent with those used for the originals filters. No new failure modes would be introduced and therefore no increase in malfunction probability is expected.

4. The changes provided in this specification will not increase the consequences of malfunction of equipment important to safety. As stated in 3 above, the exhaust system affected are not safety related however, credit is taken for this equipment in 2SAR section 15.0. The changes in the specification will not result in a medium efficiency roughing filter or HEPA filter design of significant difference that could cause an increase of the consequences of malfunction by the introduction of a significant new design, different materials, or reduction of filter qualification testing by the manufacturer.

5. The changes provided in this specification will not create an accident of a different type than previously evaluated. The type of accident that this change could present would be any type of filter cell failure that would allow a reduction in particulate removal efficiencies in the air stream to the charcoal adsorber which could affect the iodine efficiency removal and the resultant dose release. This is not considered to be a credible failure since the filters are being designed and constructed to equivalent codes and standards consistent with the originals and with commensurate design qualification and production testing by the manufacturer.

6. The changes provided in this specification will not create a malfunction of equipment important to safety of a different type than previously evaluated. As stated in 3 above the equipment associated with the exhaust system filter train are not safety related however, credit is taken for this equipment in 2SAR section 15 for filtration of releases. The changes in the specification will result in the medium efficiency roughing filter or HEPA filter being designed and constructed to equivalent codes, standards and requirements consistent with the originals and therefore equipment malfunctions of a different type will be created.

NOT RVT 9-28-00

7. The changes provided in this specification do not reduce the margin of safety of the subject exhaust systems as defined in the Technical Specification bases. The filtering efficiencies as they relate to size of particle captured by the medium efficiency roughing filter and the HEPA filter are not being reduced, the exhaust systems flow rates are not being affected, the HEPA filter efficiencies for DOP removal is not affected, the maximum combined pressure differential across the HEPA and charcoal adsorber is not being increased, and the charcoal adsorber efficiencies for removal of iodine is not being reduced. Technical Specification bases 3/4.9.4 and 3/4.9.11 was reviewed and no reduction in margin to safety was identified.

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This Document contains 3 Pages.

Document No. ER002357E201 Rev./Change No. 0

Title HPSI Injection Valve Plug Design Change

Brief description of proposed change:

The change is the replacement of the valve plugs in the ANO-2 HPSI injection MOV's, tag #'s 2CV-5015-1/5016-2/5035-1/5036-2/5055-1/5056-2/5075-1/5076-2, with plugs of a different design. The replacement plugs are of a different material and shape than the existing plugs. The plugs are being replaced in order to alleviate scoring problems previously encountered. The change also includes the chamfering of the edges of the valve body outlet port, also to reduce the potential for future scoring.

Will the proposed Activity:

1. Require a change to the Operating License including:
   - Technical Specifications (excluding the bases)? Yes☐ No☒
   - Operating License? Yes☐ No☒
   - Confirmatory Orders? Yes☐ No☒
2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:
   - SAR (multi-volume set for each unit)? Yes☒ No☐
   - Core Operating Limits Report? Yes☐ No☒
   - Fire Hazards Analysis? Yes☐ No☒
   - Bases of the Technical Specifications? Yes☐ No☒
   - Technical Requirements Manual? Yes☐ No☒
   - NRC Safety Evaluation Reports? Yes☐ No☒
3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒
4. Result in a potential impact to the environment? (Complete Environmental Impact Determination of this form.) Yes☐ No☒
5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒
6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒
7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7?
   - QAPM? Yes☐ No☒
   - E-Plan? Yes☐ No☒
8. Does this review depend on future NRC approval of other actions? (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No☒

Rev 1

Document No. ER002357E201 Rev./Change No. 0

Basis for Determination (Questions 1, 2, & 3):

Question 1 Response: The HPSI injection valve plug design is not addressed in the operating license and therefore no change is required to the operating license.

Question 2 Response: The HPSI injection valve plug material is addressed in SAR Sections 6.3.2.4 and 6.3.2.19. Specifically, these SAR sections convey that components of the SIS (or materials in contact with radioactive coolant) are fabricated of austenitic stainless steel, and the valve seats are stellite or equivalent material. The entire replacement plugs ~~is~~ are constructed of the NOREM B1 material (i.e., no hardfacing of a different material), which is ~~not~~ considered to be austenitic stainless steel. No other SAR document is affected by this change. (neither of RBS 8/1/00 Rev1) (or NOREM 02A Rev1 RBS 8/1/00)

Rev 1

Question 3 Response: No test or experiment not described in the SAR is involved with this change. Post modification testing will consist of existing test activities.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # ___ (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document	Section
LRS:	All (valve, HPSI, high pressure safety injection, 2CV-5015-1, 2CV-5016-2, 2CV-5035-1, 2CV-5036-2, 2CV-5055-1, 2CV-5056-2, 2CV-5075-1, 2CV-5076-2, stellite, cobalt)
MANUAL SECTIONS:	6.3
FIGURES:	Table 6.3-1, Table 6.3-3, Figure 6.3-2

Stephen J. Lynn — Stephen J. Lynn — 5-22-00
Certified Reviewer's Signature — Printed Name — Date

Reviewer's certification expiration date: 5/26/01

Assistance provided by:

Printed Name	Scope of Assistance	Date
Randall S. Smith	LRS Search	4/14/00

Search ~~Scope~~ Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

Steve Chandler — Steve Chandler — 5-25-00
Certified Reviewer's Signature — Printed Name — Date

~~ER002357E201~~ RBS 8/29/00
~~PAGE 6 REV 0~~

ENVIRONMENTAL IMPACT DETERMINATION
(UNIT 1 and UNIT 2)

Document No. ER002357E201 Rev./Change No. 0

Complete the following Determination. If the answer to any item below is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

FORM TITLE: 10CFR50.59 REVISION	FORM NO. 1000.131D	REV. 003-04-0

This Document contains 1 Page.

Document No. ER002357E201 Rev./Change No. 1 10CFR50.59 Eval. No. FFN#00-062

Revision No. 1

This form is to be used to document Revisions to 10CFR50.59 Evaluations. Revisions to a 10CFR50.59 Evaluation after PSC review may become necessary due to SRC review, changes to the original document, etc. Refer to section 6.2.4 of this procedure for additional guidance.

Reason for revision to 10CFR50.59 Evaluation:

ANO has been informed by the supplier that the valve plugs ordered in conjunction with ER002357E201 through E208 are now only available in a material designated as NOREM 02A (NOREM B1 was the previously available hardface material). ER002357E209 has been generated to provide the documentation of equivalency based on information provided by the supplier. This revision to the 50.59 evaluation is required due to specific reference in the original evaluation to the new plug material. No change to the response for Questions 1 through 7 is required.

Will the proposed revision result in any additional:

1)	Change to the Operating License?	Yes ☐	No ☒
2)	Change to other Licensing Basis Document?	Yes ☐	No ☒
3)	Conduct of test or experiment?	Yes ☐	No ☒
4)	Impact to the environment?	Yes ☐	No ☒
5)	Need for a Radiological Safety Evaluation?	Yes ☐	No ☒
6)	Impact Ventilated Storage Cask Activities	Yes ☐	No ☒
7)	Impact the QAPM or E-Plan?	Yes ☐	No ☒

If yes, describe below and take appropriate action as per initial Determination:

N/A

Indicate revisions to the 10CFR50.59 Evaluation by placing revision number at the top right hand corner of each page of the form(s). Changes should be lined through, initialed, dated and indicated with the revision number. For extensive changes, new forms may be used with revision bars in the margin denoting changes. Attach this form to front of previous 10CFR50.59 Evaluation. Return to the PSC for review.

Stephen J. Lynn — Certified Reviewer's Signature

Stephen J. Lynn — Printed Name

8-29-00 — Date

Reviewer's certification expiration date: 5/26/01

PSC review: [signature] Date: 9/21/00

Rev. 1

Document No. ER002357E201 Rev./Change No. 0

10CFR50.59 Review Continuation Page

Synopsis of Modification

ER002357E201 replaces the valve plugs of the eight HPSI injection MOV's with an updated design. The existing plug design has exhibited a tendency to become scored when operated during high flow conditions. Once scored, the possibility of galling is heightened. The new plug design differs in two respects from the existing design. The existing stainless steel plug material is replaced with an alloy known as NOREM B1 (also known as NOREM 01). This material, developed by EPRI, is recommended by the valve manufacturer as a replacement plug material for this application. It was developed as a hardfacing material, however, for valve sizes 2" and smaller (the subject valves are 2") the entire plug is constructed of the material. The superior hardness of the new plug material in relation to the stainless steel valve body reduces the possibility of scoring and galling. The new plug design is also shaped differently from the existing plug. The new plug is what is known as a double taper design. Per the valve manufacturer, the Cv of the valve is not changed by the change in plug shape or material. Testing performed by ANO personnel at the Wyle test facilities has confirmed the superior performance offered by the new plug design in terms of resistance to scoring and reduced valve factor. or by NOREM 02A. R&& 8/7/00 Rev 1

Another facet of the change is the chamfering of the edge of the outlet port. The damage seen previously has been concentrated in the outlet port area and is believed to be the result of the plug passing the existing sharp edges of the outlet port and in essence being scraped by that sharp edge.

Finally, the valve bodies will be honed (if needed) prior to installation of the new plugs. This will further reduce the possibility of future scoring.

Post modification testing will include applicable MOV testing, system flow verification and stroke timing. However, if the associated manual valves used for flow balancing are required for isolation or are otherwise disturbed, a workplan to rebalance system flows may be required.

Design Basis

Flow balance of the system is accomplished by throttling of the manual valve associated with each injection MOV. The new plug design will not alter the flow characteristics of the balanced system because the injection MOV's are opened fully and plug shape of the MOV's is not a controlling factor. The NOREM B1 material is compatible with radioactive fluid contact and contains <0.1% by weight of cobalt. This material has been ~~previously~~ evaluated and found acceptable for use at ANO (Reference Specification ANO-M-2456). This change is intended only to replace an existing valve component with a more suitable design. No risk is added by virtue of this modification. R&& 8/7/00 Rev 1 and NOREM 02A R&& 8/7/00 Rev 1

The change will cause one aspect of the SAR to no longer be true in that the SAR states that all SIS components in contact with the radioactive coolant are austenitic stainless steel except for valve seats. Since the entire plug is of the NOREM B1 alloy (not considered an austenitic stainless steel), an LDCR will be processed to effect a change to the SAR. or NOREM 02A R&& 8/7/00 Rev 1

Answers Form 1000.131B Questions

Question 1 Response: HPSI system component failure is not credited with initiating any of the previously evaluated accidents in the SAR. The valves will remain normally closed and will open in response to a safeguards actuation as before. Replacement of the injection MOV plugs with an updated design does not therefore increase the probability of an accident previously evaluated in the SAR.

Question 2 Response: The replacement valve plugs will provide the same component function as the existing plugs. The change in material and shape of the plugs will also not affect HPSI system functional performance, i.e., flow capacity and isolation capability are unaffected. Therefore, the consequences of an accident previously evaluated in the SAR is not increased.

Question 3 Response: The replacement plugs are constructed to the same Code requirements and ANO design specification as the existing plugs and will serve identical functions. The conditions under which any associated system equipment operates is unchanged. Therefore, the probability of the malfunction of equipment important to safety is not increased.

Question 4 Response: No change in HPSI system configuration or functional capabilities is introduced by this change. The consequence of failure of the new valve plug design is identical to that which would have previously been experienced. Therefore, the consequences of a malfunction of equipment important to safety are unchanged.

Question 5 Response: The change in valve plug design does not affect HPSI system operation or configuration or its interface with other plant systems. It is therefore not credible that an accident of a different type than any previously evaluated in the SAR would be created.

Question 6 Response: No change in HPSI system capabilities or performance is introduced by this change. The new plug design is subject to the same Code requirements and ANO design specification stipulations as the existing plugs and will serve identical functions. No malfunction of equipment important to safety of a different type than previously evaluated in the SAR will be created.

Question 7 Response: The performance capabilities of the HPSI system or any of its components are unaffected by the change of injection MOV plug design. Because the HPSI system and component performance is unaffected, the margin of safety defined in the basis for any technical specification will not be reduced.

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This Document contains 3 Pages.

Document No. ER002357E201 Rev./Change No. 0

Title HPSI Injection Valve Plug Design Change

Brief description of proposed change:

The change is the replacement of the valve plugs in the ANO-2 HPSI injection MOV's, tag #'s 2CV-5015-1/5016-2/5035-1/5036-2/5055-1/5056-2/5075-1/5076-2, with plugs of a different design. The replacement plugs are of a different material and shape than the existing plugs. The plugs are being replaced in order to alleviate scoring problems previously encountered. The change also includes the chamfering of the edges of the valve body outlet port, also to reduce the potential for future scoring.

Will the proposed Activity:

1. Require a change to the Operating License including:

   Technical Specifications (excluding the bases)? Yes☐ No☒

   Operating License? Yes☐ No☒

   Confirmatory Orders? Yes☐ No☒

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:

   SAR (multi-volume set for each unit)? Yes☒ No☐

   Core Operating Limits Report? Yes☐ No☒

   Fire Hazards Analysis? Yes☐ No☒

   Bases of the Technical Specifications? Yes☐ No☒

   Technical Requirements Manual? Yes☐ No☒

   NRC Safety Evaluation Reports? Yes☐ No☒

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒

4. Result in a potential impact to the environment? (Complete Environmental Impact Determination of this form.) Yes☐ No☒

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7?

   QAPM? Yes☐ No☒

   E-Plan? Yes☐ No☒

8. Does this review depend on future NRC approval of other actions? (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No☒

FORM TITLE: 10CFR50.59 DETERMINATION	FORM NO. 1000.131A	REV. 003-04-0

Rev 1

Document No. ER002357E201 Rev./Change No. 0

Basis for Determination (Questions 1, 2, & 3):

Question 1 Response: The HPSI injection valve plug design is not addressed in the operating license and therefore no change is required to the operating license.

Question 2 Response: The HPSI injection valve plug material is addressed in SAR Sections 6.3.2.4 and 6.3.2.19. Specifically, these SAR sections convey that components of the SIS (or materials in contact with radioactive coolant) are fabricated of austenitic stainless steel, and the valve seats are stellite or equivalent material. The entire replacement plugs ~~is~~ are constructed of the NOREM B1 material (i.e., no hardfacing of a different material), which is ~~not~~ considered to be austenitic stainless steel. No other SAR document is affected by this change. (, neither of RSS 8/1/00 Rev1) (or NOREM 02A RSS 8/1/00 Rev1)

Rev 1

Question 3 Response: No test or experiment not described in the SAR is involved with this change. Post modification testing will consist of existing test activities.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # ___. (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document	Section
LRS:	All (valve, HPSI, high pressure safety injection, 2CV-5015-1, 2CV-5016-2, 2CV-5035-1, 2CV-5036-2, 2CV-5055-1, 2CV-5056-2, 2CV-5075-1, 2CV-5076-2, stellite, cobalt)
MANUAL SECTIONS:	6.3
FIGURES:	Table 6.3-1, Table 6.3-3, Figure 6.3-2

Stephen J. Lynn — Stephen J. Lynn — 5-22-00
Certified Reviewer's Signature / Printed Name / Date

Reviewer's certification expiration date: 5/26/01

Assistance provided by:

Printed Name	Scope of Assistance	Date
Randall S. Smith	LRS Search	4/14/00

Search Scope Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

Steve Chandler — Steve Chandler — 5-25-00
Certified Reviewer's Signature / Printed Name / Date

~~ER002357E201 PAGE 6 REV 0~~ RSS 8/29/00

ENVIRONMENTAL IMPACT DETERMINATION
(UNIT 1 and UNIT 2)

Document No. ER002357E201 Rev./Change No. 0

Complete the following Determination. If the answer to any item below is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

Rev. 1

Document No. ER002357E201 Rev./Change No. 0

10CFR50.59 Review Continuation Page

Synopsis of Modification

ER002357E201 replaces the valve plugs of the eight HPSI injection MOV's with an updated design. The existing plug design has exhibited a tendency to become scored when operated during high flow conditions. Once scored, the possibility of galling is heightened. The new plug design differs in two respects from the existing design. The existing stainless steel plug material is replaced with an alloy known as NOREM B1 (also known as NOREM 01). This material, developed by EPRI, is recommended by the valve manufacturer as a replacement plug material for this application. It was developed as a hardfacing material, however, for valve sizes 2" and smaller (the subject valves are 2") the entire plug is constructed of the material. The superior hardness of the new plug material in relation to the stainless steel valve body reduces the possibility of scoring and galling. The new plug design is also shaped differently from the existing plug. The new plug is what is known as a double taper design. Per the valve manufacturer, the Cv of the valve is not changed by the change in plug shape or material. Testing performed by ANO personnel at the Wyle test facilities has confirmed the superior performance offered by the new plug design in terms of resistance to scoring and reduced valve factor. or by NOREM 02A. RBB 8/7/00 Rev 1

Another facet of the change is the chamfering of the edge of the outlet port. The damage seen previously has been concentrated in the outlet port area and is believed to be the result of the plug passing the existing sharp edges of the outlet port and in essence being scraped by that sharp edge.

Finally, the valve bodies will be honed (if needed) prior to installation of the new plugs. This will further reduce the possibility of future scoring.

Post modification testing will include applicable MOV testing, system flow verification and stroke timing. However, if the associated manual valves used for flow balancing are required for isolation or are otherwise disturbed, a workplan to rebalance system flows may be required.

Design Basis

Flow balance of the system is accomplished by throttling of the manual valve associated with each injection MOV. The new plug design will not alter the flow characteristics of the balanced system because the injection MOV's are opened fully and plug shape of the MOV's is not a controlling factor. The NOREM B1 material is compatible with radioactive fluid contact and contains <0.1% by weight of cobalt. This material has been ~~previously~~ evaluated and found acceptable for use at ANO (Reference Specification ANO-M-2456). This change is intended only to replace an existing valve component with a more suitable design. No risk is added by virtue of this modification. RBB 8/7/00 Rev 1 and NOREM 02A RBB 8/24/00 Rev 1

The change will cause one aspect of the SAR to no longer be true in that the SAR states that all SIS components in contact with the radioactive coolant are austenitic stainless steel except for valve seats. Since the entire plug is of the NOREM B1 alloy (not considered an austenitic stainless steel), an LDCR will be processed to effect a change to the SAR. or NOREM 02A RBB 8/7/00 Rev. 1

Answers Form 1000.131B Questions

Question 1 Response: HPSI system component failure is not credited with initiating any of the previously evaluated accidents in the SAR. The valves will remain normally closed and will open in response to a safeguards actuation as before. Replacement of the injection MOV plugs with an updated design does not therefore increase the probability of an accident previously evaluated in the SAR.

Question 2 Response: The replacement valve plugs will provide the same component function as the existing plugs. The change in material and shape of the plugs will also not affect HPSI system functional performance, i.e., flow capacity and isolation capability are unaffected. Therefore, the consequences of an accident previously evaluated in the SAR is not increased.

FORM TITLE: 10CFR50.59 REVISION	FORM NO. 1000.131D	REV. 003-04-0

This Document contains 1 Page.

Document No. ER002357E201 Rev./Change No. 1 10CFR50.59 Eval. No. EFNH 00-063

Revision No. 1

This form is to be used to document Revisions to 10CFR50.59 Evaluations. Revisions to a 10CFR50.59 Evaluation after PSC review may become necessary due to SRC review, changes to the original document, etc. Refer to section 6.2.4 of this procedure for additional guidance.

Reason for revision to 10CFR50.59 Evaluation:

ANO has been informed by the supplier that the valve plugs ordered in conjunction with ER002357E201 through E208 are now only available in a material designated as NOREM 02A (NOREM B1 was the previously available hardface material). ER002357E209 has been generated to provide the documentation of equivalency based on information provided by the supplier. This revision to the 50.59 evaluation is required due to specific reference in the original evaluation to the new plug material. No change to the response for Questions 1 through 7 is required.

Will the proposed revision result in any additional:

1)	Change to the Operating License?	Yes ☐ No ☒
2)	Change to other Licensing Basis Document?	Yes ☐ No ☒
3)	Conduct of test or experiment?	Yes ☐ No ☒
4)	Impact to the environment?	Yes ☐ No ☒
5)	Need for a Radiological Safety Evaluation?	Yes ☐ No ☒
6)	Impact Ventilated Storage Cask Activities	Yes ☐ No ☒
7)	Impact the QAPM or E-Plan?	Yes ☐ No ☒

If yes, describe below and take appropriate action as per initial Determination:

N/A

Indicate revisions to the 10CFR50.59 Evaluation by placing revision number at the top right hand corner of each page of the form(s). Changes should be lined through, initialed, dated and indicated with the revision number. For extensive changes, new forms may be used with revision bars in the margin denoting changes. Attach this form to front of previous 10CFR50.59 Evaluation. Return to the PSC for review.

Stephen J. Lynn — Certified Reviewer's Signature

Stephen J. Lynn — Printed Name

8-29-00 — Date

Reviewer's certification expiration date: 5/26/01

PSC review: [signature] Date: 9/21/00

Question 3 Response: The replacement plugs are constructed to the same Code requirements and ANO design specification as the existing plugs and will serve identical functions. The conditions under which any associated system equipment operates is unchanged. Therefore, the probability of the malfunction of equipment important to safety is not increased.

Question 4 Response: No change in HPSI system configuration or functional capabilities is introduced by this change. The consequence of failure of the new valve plug design is identical to that which would have previously been experienced. Therefore, the consequences of a malfunction of equipment important to safety are unchanged.

Question 5 Response: The change in valve plug design does not affect HPSI system operation or configuration or its interface with other plant systems. It is therefore not credible that an accident of a different type than any previously evaluated in the SAR would be created.

Question 6 Response: No change in HPSI system capabilities or performance is introduced by this change. The new plug design is subject to the same Code requirements and ANO design specification stipulations as the existing plugs and will serve identical functions. No malfunction of equipment important to safety of a different type than previously evaluated in the SAR will be created.

Question 7 Response: The performance capabilities of the HPSI system or any of its components are unaffected by the change of injection MOV plug design. Because the HPSI system and component performance is unaffected, the margin of safety defined in the basis for any technical specification will not be reduced.

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Document No. ER 002528 E201 Rev./Change No. 1

Basis for Determination (Questions 1, 2, & 3):

During Cycle 14 outages, from Mode 3 and prior to Mode 5, the NPSHA will be approximately 0.3' less than is shown in SAR sections 6.3.2.14 and Table 6.2-18 for the HPSI and CS systems respectively. Also, Section 7.3 states that "at least 2' of margin between available and required " for both pumps. The reduction is due to the light material being allowed into the containment building per ER 002528 E201.

This slight decrease in NPSHA does not require a documentation revision since it is a temporary condition (Cycle 14 outages, from Mode 3 and prior to Mode 5).

The operating license is not affected and the activity does not represent a test or experiment.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # ___, (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document Section

LRS: 50.59-unit 2 ("eccs", "npsh", "eccs and npsh", "LPI", "CS")

MANUAL SECTIONS: chapter 6 and 7: Sections 6.3.2.14.7.3 and Table 6.2-18

FIGURES: chapter 6

Edward R. France — Edward R. France — 7/20/00

Certified Reviewer's Signature — Printed Name — Date

Reviewer's certification expiration date: 5/27/01

Assistance provided by:

Printed Name	Scope of Assistance	Date

Search Scope Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

John Richardson — John Richardson — 7/21/00

Certified Reviewer's Signature — Printed Name — Date

This Document contains 3 Pages.

Document No. ER 002528 E201 Rev./Change No. 1

Title ANO-2 CONTAINMENT SUMP OPERABILITY DURING CYCLE 14 OUTAGES INCLUDING 2R14, FROM MODE 3 TO PRIOR TO MODE 5.

Brief description of proposed change:

Under LOCA conditions the NPSHA for the ECCS pumps will be reduced by approximately 0.3' water during Cycle 14 outages (from Mode 3 and prior to Mode 5) due to extra material allowed to be brought into the building. Since this is for a relatively short duration and with a large percentage of the margin left, a revision to the SAR is not deemed required.

The values that are shown on the attached pages from the SAR.

Will the proposed Activity:

1. Require a change to the Operating License including:

   Technical Specifications (excluding the bases)? Yes☐ No☒

   Operating License? Yes☐ No☒

   Confirmatory Orders? Yes☐ No☒

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:

   SAR (multi-volume set for each unit)? Yes☒ No☐

   Core Operating Limits Report? Yes☐ No☒

   Fire Hazards Analysis? Yes☐ No☒

   Bases of the Technical Specifications? Yes☐ No☒

   Technical Requirements Manual? Yes☐ No☒

   NRC Safety Evaluation Reports? Yes☐ No☒

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒

4. Result in a potential impact to the environment? (Complete Environmental Impact Determination of this form.) Yes☐ No☒

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7?

   QAMO? Yes☐ No☒

   E-Plan? Yes☐ No☒

FORM TITLE: 10CFR50.59 SAFETY EVALUATION	FORM NO. 1000.131B	REV. 3 PC-2

This Document contains 1 Page.

Document No. ER 002528 E201 Rev./Change No. 1 10CFR50.59 Eval. No. FFN#00-078 (Assigned by PSC)

Title ANO-2 Sump Operability During Cycle 14 Outages Including 2R14, from Mode 3 and Prior to Mode 5.

A WRITTEN RESPONSE PROVIDING THE BASIS FOR THE ANSWER TO EACH QUESTION MUST BE ATTACHED. EACH QUESTION MUST BE ANSWERED SEPARATELY. A SIMPLE STATEMENT OF CONCLUSION IS NOT SUFFICIENT. ATTACHMENT 2 PROVIDES GUIDANCE FOR RESPONSE.

If the answer to any question on this form is "Yes," then an unreviewed safety question is involved. If the answer to all questions is "No," then the proposed change does not involve an unreviewed safety question.

1.	Will the probability of an accident previously evaluated in the SAR be increased?	Yes ☐ No ☒
2.	Will the consequences of an accident previously evaluated in the SAR be increased?	Yes ☐ No ☒
3.	Will the probability of a malfunction of equipment important to safety be increased?	Yes ☐ No ☒
4.	Will the consequences of a malfunction of equipment important to safety be increased?	Yes ☐ No ☒
5.	Will the possibility of an accident of a different type than any previously evaluated in the SAR be created?	Yes ☐ No ☒
6.	Will the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR be created?	Yes ☐ No ☒
7.	Will the margin of safety as defined in the basis for any technical specification be reduced?	Yes ☐ No ☒

Certified Reviewer's Signature	Printed Name	Date
Edward L France	Edward R. France	7/20/00

Reviewer's certification expiration date: 5/27/01

Assistance provided by:

Printed Name	Scope of Assistance	Date
John Richardson	Preparer of NPSH calcs for ECCS pumps	7/20/00

PSC review by: [signature] Date: 7/21/2000

ENVIRONMENTAL IMPACT DETERMINATION (UNIT 1 and UNIT 2)

Document No. ER 002528 E201 Rev./Change No. 1

Complete the following Determination. If the answer to any item below is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

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Document No. **ER002409E201** Rev./Change No. **0**

Basis for Determination (Questions 1, 2 & 3):

Question 1: The Operating License does not address the need to provide cooling water to the HPSI pumps. Providing guidance to close the inlet isolation valves when service water temperature is below 75°F will not make the Operating License untrue.

Question 2: The HPSI pump cooler inlet isolation valves appear in SAR figure 9.2-1. Adding a note to this drawing indicating that these valves may be either open or shut reference ER002409E201 does not make any of the information on the drawing untrue or inaccurate but it does add information to the drawing.

Question 3. Closing the HPSI pump cooler inlet isolation valves when service water temperature is below 75°F will provide zero flow to the HPSI pump cooler as described in SAR Table 9.2-1, note 11. Since this condition is already analyzed in the SAR, it is not a test or experiment.

☐ Proposed change does not require 10 CFR 50.59 Evaluation per Attachment 1, Item #___, (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in Question 1, 2 and 3. If a search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document	Section
LRS:	
50.59 - Unit 2	**2E*53*, HPSI w/10 service, HPSI w/10 cool*, HPSI w/10 bearing or Seal, High Pressure Safety Injection w/10 service, High Pressure Safety Injection w/10 cool*, High Pressure Safety Injection w/10 bearing or Seal**
MANUAL SECTIONS:	
9.2.1, 6.3.2.2.4	
FIGURES:	
9.2-1,	**Table 9.2-1**

Certified Reviewer's Signature	**Steven L. Smith** Printed Name	**2/24/2000** Date

Reviewer's certification expiration date: **3/5/2001**

Assistance provided by:

Printed Name	Scope of Assistance	Date

Search Scope Review Acceptability (NA, if performed by Technical Review per 1000.006)

Certified Reviewer's Signature	Ted S. Ivy Printed Name	2/29/00 Date

FORM TITLE:	ARKANSAS NUCLEAR ONE	FORM NO.	REV.
	10CFR50.59 DETERMINATION	1000.131A	003-03-0

Document No. **ER002409E201** Rev./Change No. **0**

Title **Isolation of Service Water Cooling from HPSI Pumps**

Brief description of proposed change: **Evaluates Isolation of Service Water Flow from HPSI Pumps**

Will the proposed Activity:

1. Require a change to the Operating License including:

   Technical Specifications (excluding the bases)? Yes☐ No☒

   Operating License? Yes☐ No☒

   Confirmatory Orders? Yes☐ No☒

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:

   SAR (multi-volume set for each unit)? Yes☒ No☐

   Core Operating Limits Report Yes☐ No☒

   Fire Hazards Analysis? Yes☐ No☒

   Bases of the Technical Specifications? Yes☐ No☒

   Technical Requirements Manual? Yes☐ No☒

   NRC Safety Evaluation Reports? Yes☐ No☒

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒

4. Result in a potential impact to the environment? (Complete the Environmental Impact Determination of this form.) Yes☐ No☒

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7:

   QAMO? Yes☐ No☒

   E-Plan? Yes☐ No☒

10CFR50.59 Eval. No. 00-027
(Assigned by PSC)

Document No. **ER002409E201** Rev./Change No. **0**

Title **Isolation of Service Water Flow from HPSI Pumps**

A WRITTEN RESPONSE PROVIDING THE BASIS FOR THE ANSWER TO EACH QUESTION MUST BE ATTACHED. EACH QUESTION MUST BE ANSWERED SEPARATELY. A SIMPLE STATEMENT OF CONCLUSION IS NOT SUFFICIENT. ATTACHMENT 2 PROVIDES GUIDANCE FOR RESPONSE.

If the answer to any question on this form is "Yes," then an unreviewed safety question is involved. If the answer to all questions is "No," then the proposed change does not involve an unreviewed safety question.

1. Will the probability of an accident previously evaluated in the SAR be increased? Yes ☐ No ☒

The proposed change involves the cooling water flow to a safety related pump credited as part of the Emergency Core Cooling System which provides short term and long term emergency core cooling and core reactivity control following a Loss of Coolant Accident. The High Pressure Safety Injection (HPSI) pump vendor has recently provided guidance that the pump should not be operated with cooling water less than 75°F. Since the HPSI pumps are standby equipment and cannot affect accident initiation, the proposed change will not introduce any new conditions that would increase the likelihood of events that are credited with initiating an accident previously evaluated by the SAR.

2. Will the consequences of an accident previously evaluated in the SAR be increased? Yes ☐ No ☒

ER974487E201 determined that the HPSI pumps remain operable and fully capable of performing their safety related function with zero service water cooling flow to the pump. Based on conclusions of the ER, the HPSI pumps will remain operable when the service water inlet valves to the pumps are closed. This proposed change provides guidance to close the service water inlet valves when the service water is below 75°F and open these same valves when the service water is 75°F and higher. The closing of these valves has no impact on the ability of the SW or HPSI system to perform its design functions, nor does it impact the SW accident analysis in the SAR. Therefore, there is no increase in the offsite dose consequences of a previously analyzed accident as a result of securing service water cooling flow to the HPSI pumps.

3. Will the probability of a malfunction of equipment important to safety be increased? Yes ☐ No ☒

ER974487E201 included review of testing and evaluation to determine past operability of the HPSI pumps during the late 1970's and early 1980 when service water flows were determined to be degraded. This testing and evaluation was documented in a 1981 report, *Evaluation of HPSI Operability Without Service Water (SW) Cooling Report Revision 1, dated October 21, 1981.* This report describes the testing performed, summarizes the test results, explains the analyses performed to extrapolate the measured data to the conditions which would exist in an accident and draws conclusions about the pump operability/reliability without service water flow. During November 1980, tests were run on the three ANO-2 HPSI pumps to determine the effect of pump operation without cooling water flow through the bearing and seal coolers. The pumps were tested by recirculating flow to the refueling water tank and were run until stable bearing and seal temperatures were achieved with zero cooling water flow. In order to assess the impact of loss of

ENVIRONMENTAL IMPACT DETERMINATION (UNIT 1 and UNIT 2)

Document No. **ER002409E201** Rev./Change No. **0**

Complete the following Determination. If the answer to any checklist item is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

6. Will the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR be created? Yes ☐ No ☒

Securing service water cooling flow to the HPSI pumps when service water temperatures are less than 75°F does not introduce a malfunction that has not been previously evaluated. ER974487E201 determined that the HPSI pumps would continue to function and perform their safety-related function with zero service water flow. The change will slightly reduce heat removal loads and flow resistance for the service water system by removing the HPSI pump lube oil and seal heat loads. This lighter heat load and reduced pipe resistance on the service water system is very slight and in a conservative direction for service water operation. Additional chemical treatment and inspections of stagnant components will prevent significant degradation of the isolated components. The additional flow to other SW cooled components as a result of closing these valves is insignificant and will have no adverse impact on the SW system or any cooled components. These changes are not circumstances different enough from those considered by previous accident analysis to credibly introduce a malfunction of equipment important to safety of a different type than previously evaluated in the SAR.

7. Will the margin of safety as defined in the basis for any technical specification be reduced? Yes ☐ No ☒

Securing service water cooling flow to the HPSI pumps when service water temperatures are less than 75°F does not effect the margin of safety in any technical specification. ER974487E201 determined that the HPSI pumps would continue to operate and perform their safety-related function with zero service water flow. The testing and analysis performed in 1980 operated the HPSI pumps without service water flow until the bearing temperatures stabilized. The conclusions reached in ER974487E201 indicated that the pumps would perform their function with no loss of capability without service water flow. Bearing temperatures would stabilize at a higher but maintainable level and that these operating parameters would allow full non-degraded performance of the safety functions without service water flow. The isolation of these SW valves will direct additional SW flow to other cooled components, but this flow is negligible and will have no adverse impact on the system or its ability to meet design basis functions. Additional chemical treatment of the stagnant components and periodic inspections will assure that there is no adverse impact to any SW components. Since no failure or reduction of performance is expected, there is no reduction in the safety margin of any technical specification.

Steven L. Smith — Steven L. Smith — 2/29/00

Certified Reviewer's Signature | Printed Name | Date

Reviewer's certification expiration date: 3/5/2001

Assistance provided by:

Printed Name	Scope of Assistance	Date

PSC review by: _____ Date: 4/10/2000

service water flow through the HPSI pump bearing coolers and seal water coolers during accident conditions, a simplistic analysis using conservative assumptions was performed. This analysis adjusted the fluid temperatures of the pumped fluid upwards from the test conditions of ~75°F to a value of 200°F for containment sump temperature on recirculation and applied this same difference to the seal water cooler temperature. Additionally, the difference in the measured room ambient and the expected room temperature during a LOCA (115°F) was applied to both the bearing oil cooler and seal water cooler temperatures. These results which were reviewed by the pump vendor, Ingersoll-Rand, who confirmed that no reason exists to believe that the HPSI pumps would not have performed their intended function had an accident occurred during the time that service water flow was blocked. The pump seal manufacturer, Durametallic, prepared a test report for qualifying Dura Seals in 1978. This report documents testing performed to prove operability of their seals during various nuclear plant design conditions. This testing envelops the ANO HPSI pump accident conditions. The 1981 report concludes: "Based upon the testing performed at ANO-2 (running the HPSI pumps without service water flow through the pump bearing and seal water coolers) and the subsequent analyses, we have concluded that the HPSI pumps could have accomplished their accident function in spite of the loss of service water flow through their coolers which was discovered during the spring 1980 outage. This analysis was confirmed independently by our NSSS vendor (Combustion Engineering). ER974487E201 begins with the report summarized above and extrapolates the tests further, increasing the room temperature to 150°F and the temperature of the fluid to be pumped during recirculation to 250°F. During evaluation of these further extrapolations with the pump and seal vendors, a recommendation to use synthetic oil, Mobil SHC626, was added by the pump vendor. ER974487E201 concludes: "the allowable service water flowrate of the HPSI pumps coolers can remain at 0." The lubrication oil currently used in the HPSI pumps is the recommended Mobil SHC626. The isolation of these valves will direct additional SW flow to other cooled components, but this flow is negligible and will have no adverse impact on the system. Additional chemical treatment of the stagnant components and periodic inspections will assure that there is no adverse impact to any SW components. Therefore the proposed change of securing service water flow when service water temperatures are below 75°F does not increase the probability of malfunction of the HPSI pumps nor any other safety related equipment.

4. Will the consequences of a malfunction of equipment important to safety be increased?

Yes ☐ No ☒

Securing service water flow to the HPSI pumps will not affect offsite radiation dose (i.e. consequence of a failure) associated with the plant's response to an accident. The response of the HPSI pumps during an accident has been determined to be the same with or without service water cooling. There are no accidents evaluated in the SAR that would be affected by securing service water flow to the HPSI pumps, since these pumps have been evaluated by ER974487E201 to perform equally well with zero cooling water flow. Evaluation of the impact on the SW system by this ER has shown that there is no adverse impact to equipment important to safety nor the consequences of a malfunction.

5. Will the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Yes ☐ No ☒

Securing the service water cooling flow to the HPSI pumps will not create an accident of a different type since no new failures are introduced by this change. ER974487E201 determined that the HPSI pumps did not require cooling water to perform their safety function. The recent letter from the pump vendor not recommending operation of the HPSI pumps with cooling water less than 75°F indicates the advisability of occasionally securing service water. Since the ER974487E201 determined the pumps are reliable without service water, the strategy of securing service water when temperatures are less than 75°F is optimal. Securing service water when temperatures are less than 75°F also insures no new pump failures are introduced. Additional chemical treatment of stagnant components and the verification of no adverse impact to any SW components by this ER assures all components and systems remain capable of performing their functions.

Document No. ER 002528 E201 Rev./Change No. 1

10CFR50.59 Review Continuation Page

1. Will the probability of an accident previously evaluated in the SAR be increased?

No, the extra material allowed in the reactor building is supervised to be brought out with the worker. A limit of 50 ft2 of unsupervised material is allowed based on NPSH margin for the ECCS pumps. No revision is required to the sump screen head loss calculation nor the NPSH calculation due to the temporary nature of the Cycle 14 outages', including 2R14, defined condition (from Mode 3 and prior to Mode 5) and because there is adequate margin for NPSH. There are no changes to modes of operation, performance characteristics or requirements, or operating procedures.

2. Will the consequences of an accident previously evaluated in the SAR be increased?

No. This revision will not change the way in which the HPSI and CS systems respond under accident conditions (or any other conditions). The NPSHA was determined to be adequate before, and it is still adequate.

3. Will the probability of a malfunction of equipment important to safety be increased?

No. This evaluation does not represent any design change to the plant. The margin between required and available NPSH could be less during the defined condition (from Mode 3 and prior to Mode 5), however, there is still a positive margin even under conditions which would exist with the most conservative assumptions for level, flow and sump blockage.

4. Will the consequences of a malfunction of equipment important to safety be increased?

No. The decreased NPSH margin revealed by this evaluation will not change the operating characteristics of the pump or system. The HPSI and CS systems will respond in the same way as before, except that there is less room for modifications or procedural changes during the defined mode (from Mode 3 and prior to Mode 5) which would increase flow resistance or result in lower sump levels.

5. Will the possibility of an accident of a different type than any previously evaluated in the SAR be created?

No. The HPSI and CS systems will be operated the same as before and the system response is not changed. While the NPSH available has been reduced, there is still adequate margin for NPSH and the difference in pump discharge pressure is not significant enough to make any difference in the characteristics of the system or in its interaction with other systems.

6. Will the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR be created?

No. The NPSH calculation (91-E-0116-01) assumes minimum sump water level and pump runout flow. Even under these conditions, there is adequate NPSH available to provide the proper pump suction conditions. Pump performance is not affected by a smaller NPSH margin. Provided that the margin is positive, the pumps can be expected to perform as designed.

7. Will the margin of safety as defined in the bases for any technical specification be reduced?

No. The technical specifications require that the HPSI and CS systems be "operable". No margin of safety is defined which will be impaired by reduced NPSH margin, as long as NPSHA exceeds NPSHR.

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This Document contains 3 Pages.

Document No. ER002631E201 Rev./Change No. 0

Title LRW/BMS Configuration 2BM-95, 2BM-98, 2LRW-269 and 2LRW-270. CR-2-2000-152

Brief description of proposed change:

This ER changes the position of 2BM-95, 2BM-98, 2LRW-269 and 2LRW-270 as shown on M-2213 sh1 and M-2214 sh1 These valves were new valves added per DCP-93-2003 but were shown closed. The ER will also address the position of valves 2LRW-4, 2LRW-47, 2LRW-22 2LRW-7B, 2LRW-9B, 2BM-19A, 2BM-19B, 2BM-20A, 2BM-20B, 2BM-44, 2BM-21A, 2BM-21B, 2BM-23A, 2BM-23B, 2BM-53B 2BM-59, 2BM-61 and 2BM-76 such that the vendor skid can be utilized per DCP-93-2003. These valves did not get their position changed on the P&IDs as necessary to operate the new vendor skid. Ref CR-2-2000-152. SAR Figure 11.2-1 sh1&2 and figure 11.2-2 sh1&2 will be changed to show the valves in the proper position. Operations procedure 2104.014 will be changed to reflect the correct valve position.

Will the proposed Activity:

1. Require a change to the Operating License including:

   Technical Specifications (excluding the bases)? Yes☐ No X

   Operating License? Yes☐ No X

   Confirmatory Orders? Yes☐ No X

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:

   SAR (multi-volume set for each unit)? Yes X No☐

   Core Operating Limits Report? Yes☐ No X

   Fire Hazards Analysis? Yes☐ No X

   Bases of the Technical Specifications? Yes☐ No X

   Technical Requirements Manual? Yes☐ No X

   NRC Safety Evaluation Reports? Yes☐ No X

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No X

4. Result in a potential impact to the environment? (Complete Environmental Impact Determination of this form.) Yes☐ No X

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No X

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No X

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7?

   QAPM? Yes☐ No X

   E-Plan? Yes☐ No X

8. Does this review depend on future NRC approval of other actions? (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No X

Document No. ER002631E201 Rev./Change No. O

Basis for Determination (Questions 1, 2, & 3):

The search of the LBD concluded that changing position of these valves will require a change to SAR figures 11.2-1 sh1&2 and 11.2-2 sh1&2. The SAR was the only document that requires changing. These valves are currently in the system. The system is designed to allow process water flow through the valves to operate the system. Therefore, repositioning these valves does not constitute a special test or test not described in the SAR.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # ____, (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document Section

LRS: 50.59 Unit 2. ALL. The search criteria was 2BM-95, 2BM-98, 2LRW-269, 2LRW-270, 2LRW-4, 2LRW-47, 2LRW-22, 2LRW-7B, 2LRW-9B, 2BM-19A, 2BM-19B, 2BM-20A, 2BM-20B, 2BM-44, 2BM-21A, 2BM-21B, 2BM-23A, 2BM-23B, 2BM-53B 2BM-59, 2BM-61, 2BM-76, 2F-11, 2F-11A, 2T-72A, 2T-72B, 2T-15A; 2T-15B, 2T-76A, 2T-76B, 2T-21A, 2T-21B, 2T-69A, 2T-69B, 2T-15s, 2T-69A/B, Liquid Radwaste;. LRW; BM, BMS and vendor.

MANUAL SECTIONS: ALL figures in Chapter 9 and 11. Manual search of DCP-93-2003

FIGURES: 11.2-1 sh1, 11.2-1 sh2, 11.2-2 sh1 and 11.2-2 sh2

Certified Reviewer's Signature	Keith Perkins Printed Name	6/08/00 Date

Reviewer's certification expiration date: 7/31/01

Assistance provided by:

Printed Name	Scope of Assistance	Date

Search Scope Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

Certified Reviewer's Signature	BOTCH HOLLOWAY Printed Name	6/12/00 Date

ENVIRONMENTAL IMPACT DETERMINATION
(UNIT 1 and UNIT 2)

Document No. ER2631E201 Rev./Change No. 0

Complete the following Determination. If the answer to any item below is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	X	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	X	Increase thermal discharges to lake or atmosphere?
☐	X	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	X	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	X	Modify the design or operation of cooling tower which will change drift characteristics?
☐	X	Install any new transmission lines leading offsite?
☐	X	Change the design or operation of the intake or discharge structures?
☐	X	Discharges any chemicals new or different from that previously discharged?
☐	X	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	X	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	X	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	X	Result in a change to nonradiological effluents or licensed reactor power level?
☐	X	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

Document No. ER002631E201 Rev./Change No. 0

Basis for Determination (Questions 1, 2, & 3):

The search of the LBD concluded that changing position of these valves will require a change to SAR figures 11.2-1 sh1&2 and 11.2-2 sh1&2. The SAR was the only document that requires changing. These valves are currently in the system. The system is designed to allow process water flow through the valves to operate the system. Therefore, repositioning these valves does not constitute a special test or test not described in the SAR.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # ____ (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document Section

LRS: 50.59 Unit 2. ALL. The search criteria was 2BM-95, 2BM-98, 2LRW-269, 2LRW-270, 2LRW-4, 2LRW-47, 2LRW-22, 2LRW-7B, 2LRW-9B, 2BM-19A, 2BM-19B, 2BM-20A, 2BM-20B, 2BM-44, 2BM-21A, 2BM-21B, 2BM-23A, 2BM-23B, 2BM-53B 2BM-59, 2BM-61, 2BM-76, 2F-11, 2F-11A, 2T-72A, 2T-72B, 2T-15A, 2T-15B, 2T-76A, 2T-76B, 2T-21A, 2T-21B, 2T-69A, 2T-69B, 2T-15s, 2T-69A/B, Liquid Radwaste;. LRW; BM, BMS and vendor.

MANUAL SECTIONS: ALL figures in Chapter 9 and 11. Manual search of DCP-93-2003

FIGURES: 11.2-1 sh1, 11.2-1 sh2, 11.2-2 sh1 and 11.2-2 sh2

Certified Reviewer's Signature — Keith Perkins, Printed Name — 6/08/00, Date

Reviewer's certification expiration date: 7/31/01

Assistance provided by:

Printed Name	Scope of Assistance	Date

Search Scope Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

Certified Reviewer's Signature — BUTCH HOLLOWAY, Printed Name — 6/12/00, Date

FORM TITLE: ARKANSAS NUCLEAR ONE 10CFR50.59 SAFETY EVALUATION	FORM NO. 1000.131B	Page 1 REV. 003-04-0

This Document contains 1 Page.

Document No. ER002631E201 Rev./Change No. 0 10CFR50.59 Eval. No. FFNH 00-07 (Assigned by PSC)

Title Changing normal position of 2BM-95, 2BM-98, 2LRW-269, 2LRW-270 & other valves per ER

A WRITTEN RESPONSE PROVIDING THE BASIS FOR THE ANSWER TO EACH QUESTION MUST BE ATTACHED. EACH QUESTION MUST BE ANSWERED SEPARATELY. A SIMPLE STATEMENT OF CONCLUSION IS NOT SUFFICIENT. ATTACHMENT 2 PROVIDES GUIDANCE FOR RESPONSE.

If the answer to any question on this form is "Yes," then an unreviewed safety question is involved. If the answer to all questions is "No," then the proposed change does not involve an unreviewed safety question.

1. Will the probability of an accident previously evaluated in the SAR be increased? Yes ☐ No X
2. Will the consequences of an accident previously evaluated in the SAR be increased? Yes ☐ No X
3. Will the probability of a malfunction of equipment important to safety be increased? Yes ☐ No X
4. Will the consequences of a malfunction of equipment important to safety be increased? Yes ☐ No X
5. Will the possibility of an accident of a different type than any previously evaluated in the SAR be created? Yes ☐ No X
6. Will the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR be created? Yes ☐ No X
7. Will the margin of safety as defined in the basis for any technical specification be reduced? Yes ☐ No X

Certified Reviewer's Signature	Keith Perkins Printed Name	6-8-00 Date

Reviewer's certification expiration date: 7/31/01

Assistance provided by:

Printed Name	Scope of Assistance	Date

PSC review by: _____ Date: 7/13/2000

50.59 Evaluation Answers for ER002631E201

This ER changes the position of 2BM-95, 2BM-98, 2LRW-269 and 2LRW-270 as shown on M-2213 sh1 and M-2214 sh1. The valves are new valves added per DCP-93-2003 but were shown closed. The ER will also address the position of valves 2LRW-4, 2LRW-47, 2LRW-22 2LRW-7B, 2LRW-9B, 2BM-19A, 2BM-19B, 2BM-20A, 2BM-20B, 2BM-44, 2BM-21A, 2BM-21B, 2BM-23A, 2BM-23B, 2BM-53B 2BM-59, 2BM-61 and 2BM-76 such that the vendor skid can be utilized per DCP-93-2003. These valves did not get their position changed on the P&IDs as necessary to operate the new vendor skid. Ref CR-2-2000-152. SAR Figure 11.2-1 sh1&2 and figure 11.2-2 sh1&2 will be changed to show the valves in the proper position. Operations procedure 2104.014 will be changed to reflect the correct valve position. The 50.59 evaluation for DCP-93-2003 addressed using the vendor skid. The SAR text was changed when DCP-93-2003 was implemented. The P&ID change, however, only showed the new valves. It did not change the position of original valves to reflect use of the skid. The SAR search located text that was changed in the SAR to address the vendor skid.

Question 1

Will the probability of an accident previously evaluated in the SAR be increased?

The answer is NO.

The SAR does not credit failure on the waste-processing portion (vender skid) of the LRW or BMS systems as accident initiators. Since the system is not an impact initiator it does not change the probability of an accident. The valves do not have a safety related isolation function. They are designed to be either open or closed as necessary for Operations ~~for~~ to process wastewater. Therefore, changing the position of these valves does not create a new accident scenario such that the probability of an accident is increased.

Question 2

Will the consequences of an accident previously evaluated in the SAR be increased?

The answer is NO.

The valves do not have a safety related isolation function. They are not credited with minimizing the consequences of an accident. They are designed to be either open or closed as necessary for Operations ~~for~~ to process wastewater. Therefore, changing the position of these valves does not create a new accident scenario such that the consequences of an accident are increased. The consequences of a loss of processed, or unprocessed, waste-water are not changed by repositioning these valves.

Question 3

Will the probability of a malfunction of equipment important to safety be increased?

The answer is NO.

These valves are not important to safety. They do not have a safety function. The system is designed to operate with the valves in either the open or closed position as necessary for Operations to process wastewater. The valve line-up change does not create or eliminate a safety function. Therefore, the probability of malfunction of equipment important to safety is not changed.

Question 4

Will the consequences of a malfunction of equipment important to safety be increased?

The answer is NO

These valves are not important to safety. They do not have a safety function. The system is designed to operate with the valves in either the open or closed position as necessary for Operations to process wastewater. The valves do not mitigate the consequences of any accident. Therefore, the consequences of malfunction of equipment important to safety are not changed.

Question 5

Will the possibility of an accident of a different type than any previously evaluated in the SAR be created?

The answer is NO.

The valves are designed to be either open or closed as necessary for Operations ~~for~~ to process wastewater. Therefore, changing the position of these valves does not create a new accident. Since the system is designed for operation with the valves in either position, the possibility of a different type accident is not created. KF 7-7-00

Question 6

Will the possibility of a malfunction of equipment important to safety of a different type than previously evaluated in the SAR be created?

The answer is NO.

The valves do not interact with SSC differently or in a new way by changing status in either the open or closed position. Therefore, there are no new possibilities of malfunctions of equipment important to safety. The malfunction of these valves is not evaluated in the SAR.

Question 7

Will the margin of safety as defined in the basis for any Technical Specification be reduced?

The answer is NO.

A review was made of TS bases. The TS bases do not address or discuss this portion ~~or~~ of the system. Nor do the bases discuss portions of the LRW or BMS systems that this change could affect. Therefore, the margin of safety is not impacted by the change. KT 7-7-00

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Document No. ER002795N201 Rev./Change No. NCPR-1~~0~~

Title Repair of Leaking ANO-2 Hot Leg RTD Nozzle 2TE-4610-4

Brief description of proposed change:

Nuclear Change ER002795N201 provides the modification package for the repair of hot leg RTD 2TE-4610-4. The nozzle is to be repaired by weld overlay around the nozzle on the outside of the hot leg pipe. The repair is qualified for a limited service life ~~(at least one cycle)~~, but meets ASME Section III, Class 1 and Section XI Code requirements. The RTD will remain in place and there is no modification of the existing configuration other than the welding at the exterior of the hot leg pipe to nozzle interface.

Will the proposed Activity:

1. Require a change to the Operating License including:

   Technical Specifications (excluding the bases)? Yes☐ No☒

   Operating License? Yes☐ No☒

   Confirmatory Orders? Yes☐ No☒

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:

   SAR (multi-volume set for each unit)? Yes☒ No☐

   Core Operating Limits Report? Yes☐ No☒

   Fire Hazards Analysis? Yes☐ No☒

   Bases of the Technical Specifications? Yes☐ No☒

   Technical Requirements Manual? Yes☐ No☒

   NRC Safety Evaluation Reports? Yes☐ No☒

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒

4. Result in a potential impact to the environment? (Complete Environmental Impact Determination of this form.) Yes☐ No☒

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7?

   QAPM? Yes☐ No☒

   E-Plan? Yes☐ No☒

8. Does this review depend on future NRC approval of other actions? (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No☒

PAGE 4 REV. 0 1

Basis for Determination (Questions 1, 2, & 3):

Question 1: The ANO-2 Technical Specifications, Operating License or Cconfirmatory Orders do not discuss the hot leg RTD nozzle design details. The changes implemented in this NCP will have no effect on the number or functionality of the hot leg temperature instrumentation. Therefore, this modification will not cause information contained in the ANO-2 Technical Specifications, Operating License or confirmatory Orders to be untrue or inaccurate. Once the repair is made, the RTD nozzle will be restored to compliance with T.S. 3.4.6.2, "Reactor Coolant System Leakage" and TS 3/4.4.10, "Structural Integrity".

Question 2: The changes described in this NCP result in a hot leg RTD nozzle configuration that is slightly different than the currently installed configuration. However, the level of detail in the Core Operating Limits Report, Fire Hazards Analysis, Bases of the Technical Specifications or NRC Safety Evaluation Reports does not describe the current configuration of the Hot Leg RTD nozzles. As such, no changes to these ANO-2 documents are required.

*(six months) #c- per Telecon w/ BR 8/11/00

The proposed change affects the ANO-2 SAR in that RCS piping materials now come in contact with the RCS fluid, contrary to Table 5.2-3. In addition, the repair will be qualified for less than~~at least~~ one fuel cycle*, which differs from the design transients depicted in the fatigue analysis for the RCS in the SAR. Because this repair will be tracked under the condition reporting system, no LDCR will be issued for this NCP.

Question 3: The changes implemented by this NCP are limited to code repair of the leaking hot leg RTD nozzle by relocating the pressure boundary on the existing nozzle/pipe interface. The repaired RTD nozzle is of similar design and serves the same design function as the original nozzle. Repair of the existing leaking RTD nozzle does not constitute a test or experiment not described in the SAR.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # _____ (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document	Section
LRS: ANO-2 50.59	(Hot Leg Temperature), (Leg w/5 RTD), (RCS Materials), (2TE-4610-4), (Inconel), (Corrosion), (Clad*) (PPS), (Plant Protective System), (RRS), (Reactor Regulating System), (Structural Integrity), (Stainless), (Well), (Thermal), (Thermo), (RTD), (Resistance Temperature Detector), (Contact With), (Alloy 600), PWSCC), (Corrosion Cracking), (Weld w/30 nozzle or RTD), (Response w/30 RTD), (Design Transients w/30 RCS), (Fatigue w/30 RCS or RTD)
MANUAL SECTIONS:	Table 3.2-2, Table 3.2-3, Table 3.2-4, Table 5.1-1, Table 5.2-1, Table 5.2-3, Table 5.2-9, Table 5.5-4, Table 5.5-5, Table 5.6-1, Table 7.2-2, Table 7.2-3, Table 7.2-5, SAR 3.6.4.2.1.1, SAR 3.7.3.4.2.1, SAR 5.1, SAR 5.2.1.5, SAR 5.2.3.2, SAR 5.2.3.3, SAR 5.2.5.5, SAR 5.5.3.2, SAR5.6.1.1, SAR 7.2.1.1.2.4, SAR 7.2.1.1.2.5.1.3, SAR 7.7.1.3.3.2, SAR Sections 7.2 thru 7.6, TS 3/4.4.10
FIGURES:	Figure 5.1-1, Figure 5.1-2, Figure 5.1-3, Figure 7.6-3, Figure 7.2-29

William R Rowlett Jr. — Certified Reviewer's Signature

William R. Rowlett, Jr. — Printed Name

8/10/2000 — Date

Document No. ER002795N201 Rev./Change No. NCPR-~~10~~

PAGE 5 REV. 01

Title Leak Repair of ANO-2 Hot Leg RTD Nozzle 2TE-4610-4

Reviewer's certification expiration date: 5/25/2001

Assistance provided by:

Printed Name	Scope of Assistance	Date

Search Scope Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

Joseph C. King Jr. — Certified Reviewer's Signature

Joseph C. King Jr. — Printed Name

8-10-00 — Date

PAGE 6 REV.

ENVIRONMENTAL IMPACT DETERMINATION (UNIT 1 and UNIT 2)

Document No. ER002795N201 Rev./Change No. NCPR-10

Complete the following Determination. If the answer to any item below is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

FFN H

10CFR50.59 Eval. No. 00-86
(Assigned by PSC)

Document No. **ER002795N201** Rev./Change No. **NCPR-10** PAGE 7 REV.

Title **Repair of Leaking ANO-2 Hot Leg RTD Nozzle**

A WRITTEN RESPONSE PROVIDING THE BASIS FOR THE ANSWER TO EACH QUESTION MUST BE ATTACHED. EACH QUESTION MUST BE ANSWERED SEPARATELY. A SIMPLE STATEMENT OF CONCLUSION IS NOT SUFFICIENT. ATTACHMENT 2 PROVIDES GUIDANCE FOR RESPONSE.

Brief description of proposed change: Nuclear Change ER002795N201 provides the modification package for the repair of the hot leg RTD 2TE-4610-4 nozzle. The repair will apply an external weld to the O.D. of the nozzle and will leave the internal J-weld. The resulting configuration will be ASME Class 1 code qualified and structurally equivalent to the existing configuration with respect to RCS pressure boundary considerations and seismic qualification. A minor change is introduced in that the repair moves the pressure boundary between the nozzle and the hot leg to the outside surface of the pipe, thereby permitting RCS fluid to come into contact with the unclad carbon steel piping material. This type of contact was intentionally avoided in the original design as noted in SAR Section 5.2.3.2 and Table 5.2-3. However, as discussed in FTI Document 51-5007187-00 (ANO Calculation 86-E-0074-143), the exposure will not result in rates of corrosion that would compromise the integrity of the RCS piping or repair site. This document cites a repair to pressurizer heater nozzles at Calvert Cliffs Unit 2 in 1994 that resulted in similar contact. The repair will be qualified for less than ~~at least~~ one fuel cycle * from a fatigue/stress analysis standpoint and will be tracked under the ANO condition reporting process.

If the answer to any question on this form is "Yes," then an unreviewed safety question is involved. If the answer to all questions is "No," then the proposed change does not involve an unreviewed safety question.

1. Will the probability of an accident previously evaluated in the SAR be increased? * (six months) NCC per telecon with BR 5/11/00 Yes ☐ No ☒

   The repairs to the hot leg RTD nozzle restores the configuration to a code-qualified, structurally equivalent configuration. The method of repair of the nozzle will result in an area of unclad carbon steel piping between the leaking existing J-weld and the new hot leg nozzle pressure boundary weld. This will allow reactor coolant to contact the carbon steel hot leg piping in the gap between the two welds. The potential for material degradation due to reactor coolant being in contact with carbon steel is evaluated in FTI Document 51-5007187-00 (ANO Calculation 86-E-0074-143). This calculation evaluates the corrosion rates for carbon steel and alloy 600 materials exposed to reactor coolant. Based on the calculation conclusion, minimal corrosion of the carbon steel material is expected. The pressure boundary weld on the repaired nozzle will be equivalent to the pressure boundary weld on the original nozzle. The repair of the nozzle will meet all Class 1 requirements of the ASME code. The modified nozzle is qualified for less than ~~at lest~~ one fuel cycle * and will be tracked under the ANO condition reporting process. The postulated accident applicable to the hot leg RTD nozzles is a guillotine failure of the nozzle, which results in a small break LOCA. The repair of the nozzle does not introduce any new unanalyzed failure modes and the likelihood of a failure is not increased as a result of repairing the nozzle. Therefore, the probability of an accident previously evaluated in the SAR is not increased due to the repair of the hot leg RTD nozzle. As discussed above, the exposure of piping material to RCS fluid will not result in adverse rates of corrosion that would compromise the integrity of the hot leg piping or repair site. As such, there is no adverse impact upon the RCS pressure boundary, and the probability of an accident previously evaluated in the SAR, such as a small break LOCA is not increased.

2. Will the consequences of an accident previously evaluated in the SAR be increased? Yes ☐ No ☒

   The repair activities will not degrade the capability of the RCS to act as a fission product barrier since the pressure boundary integrity is not compromised by the change. The applicable accident is a guillotine failure of the hot leg level nozzle that results in a small break LOCA. The worst case scenario would be a

weld failure in which the nozzle is ejected from the RCS piping. The diameter of the nozzle that penetrates the RCS piping is unchanged from the existing design. A failure of the repaired nozzle would result in the same consequences as a failure of the existing nozzle. Since the consequences of the applicable accident are bounded by the existing analysis, the consequences of an accident previously evaluated in the SAR are not increased.

3. Will the probability of a malfunction of equipment important to safety be increased? Yes ☐ No ☒

The RCS hot leg piping is considered equipment important to safety. The hot leg RTD nozzles are considered part of the RCS pressure boundary and are therefore classified as equipment important to safety. With the new weld installed, the hot leg RTD nozzle is restored to compliance with the ASME Section III, Class 1 Code and is structurally sound. The repair will not introduce any new loads on the RCS piping. The natural frequency of the repaired RTD nozzle assembly will be minimally impacted by this repair, and therefore will not be excited by the RCP running frequencies. Testing ensures that the weld repair does not change the RTD response time properties. Thermal expansion effects on the repaired RTD nozzle have been shown to be negligible. This modification does not affect the normal function of the parent RCS or negatively impact the containment isolation function. The modification will not have a negative impact on the previously installed equipment and does not increase the probability of any equipment or system malfunction. Therefore, the probability of a malfunction of equipment important to safety will not be increased.

4. Will the consequences of a malfunction of equipment important to safety be increased? Yes ☐ No ☒

The repair activity restores the integrity of the RCS pressure boundary, and does not modify existing release paths or create new ones that could worsen the consequences of an equipment malfunction. The worst case malfunction of the hot leg RTD nozzle would be a weld failure in which the nozzle is ejected from the RCS piping. The diameter of the bore that penetrates the RCS piping is the same as the existing designs. A failure of the repaired nozzle would result in the same consequences as a failure of the original nozzle. Therefore, the consequences of a malfunction of equipment important to safety will not be increased. This modification does not have a negative impact on previously installed equipment and does not increase the consequence of any equipment or system malfunction. The modification does not change the operational or performance characteristics of any equipment important to safety or preclude the necessary operation of equipment important to safety.

5. Will the possibility of an accident of a different type than any previously evaluated in the SAR be created? Yes ☐ No ☒

The activity is limited to subtle changes to the existing hot leg nozzle configuration. The worst case postulated accident associated with repair of the hot leg RTD nozzle would be a failure in which the nozzle is ejected from the RCS piping. Plausible accident scenarios associated with this feature of the plant are bounded by the existing small break LOCA analysis. Therefore, the possibility of an accident of a different type than that previously evaluated in the SAR will not be created as a result of the proposed repair of the RTD nozzle.

6. Will the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR be created? Yes ☐ No ☒

No new equipment interrelationships or potential interactions are created by the activity. As discussed above, the exposure of RCS hot leg piping material to RCS fluid will not result in rates of corrosion that would compromise the integrity of the piping or nozzle repair site. The final configuration will be structurally equivalent to the existing nozzles.

7. Will the margin of safety as defined in the basis for any technical specification be reduced? Yes ☐ No ☒

The activity restores compliance with Technical Specifications 3.4.6.2 & 3.4.10.1 that require zero pressure boundary leakage and structural integrity of ASME Code Class 1, 2, & 3 components respectively. The Technical Specification 3/4.4.6.2 bases reflect the need to reduce RCS leakage to low levels. There are no specific Technical Specifications related to how the hot leg RTD nozzle is attached to the piping. The nozzle will have non-destructive examination ~~and leakage testing~~ sufficient to demonstrate zero leakage following the modification. This will provide a level of assurance against pressure boundary failure equivalent to the rest of the RCS piping and equal to the original nozzle installation. Adding the additional outer weld does not affect the operation of the parent RCS or containment isolation functions

William R. Rowlett, Jr. — Certified Reviewer's Signature

William R. Rowlett, Jr. — Printed Name

8/10/2000 — Date

Reviewer's certification expiration date: **5/25/2001**

Assistance provided by:

Printed Name	Scope of Assistance	Date

PSC review by: _____ Date: 8/11/2000

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PAGE 4 REV. 0

Document No. ER002795N202 Rev./Change No. 0

Title **2R14 Replacement of Alloy 600 RTD and Sample/PT Nozzles**

Brief description of proposed change:

Nuclear Change ER002795N202 provides the modification package for the replacement of the modified RTD nozzles and the one sample Alloy 600 nozzle on the RCS hot legs. There are nineteen hot leg nozzles total. Eighteen of the nozzles are RTD's and one is a sample nozzle. Eight of the RTD nozzles were originally sample/pressure taps, but were modified to RTDs during plant startup testing. The nozzles that are mandatory for replacement this outage are the four RTDs that are below mid-loop and the one sample nozzle that is at mid-loop. These five nozzles are only accessible when the Reactor is defueled and the RCS Hot Leg piping is drained. Therefore, because of the location of these five nozzles, this modification will be installed during the Steam Generator Outage when the Reactor will be defueled and RCS piping will be out of service. Four (4) additional modified RTD nozzles located on the RCS hot leg piping above mid-loop have been added to the scope of the ER to allow replacement if outage schedule permits. This modification will change the existing configuration by removing a portion of the existing nozzle and installing a replacement nozzle that will be welded on the exterior of the hot leg pipe at the pipe to nozzle interface. This configuration moves the pressure boundary between the nozzle and the hot leg to the outside surface of the pipe. This configuration will allow a small area of carbon steel material to be in contact with RCS fluid. This condition has been evaluated and determined to be acceptable as documented in this NCP. The replacement nozzle material will be Alloy 690 material which is more resistant to Primary Water Stress Corrosion Cracking (PWSCC) than the original Alloy 600 material. This replacement meets all ASME Section III, Class 1 and Section XI Code requirements.

Will the proposed Activity:

1. Require a change to the Operating License including:

   Technical Specifications (excluding the bases)? Yes☐ No☒

   Operating License? Yes☐ No☒

   Confirmatory Orders? Yes☐ No☒

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:

   SAR (multi-volume set for each unit)? Yes☒ No☐

   Core Operating Limits Report? Yes☐ No☒

   Fire Hazards Analysis? Yes☐ No☒

   Bases of the Technical Specifications? Yes☐ No☒

   Technical Requirements Manual? Yes☐ No☒

   NRC Safety Evaluation Reports? Yes☐ No☒

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒

4. Result in a potential impact to the environment? (Complete Environmental Impact Determination of this form.) Yes☐ No☒

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7? PAGE 5 REV. 0

Document No. ER002795N202 Rev./Change No. 0

QAPM? Yes☐ No☒

E-Plan? Yes☐ No☒

8. Does this review depend on future NRC approval of other actions? (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No☒

Basis for Determination (Questions 1, 2, & 3):

Question 1: The ANO-2 Technical Specifications, Operating License or confirmatory Orders do not discuss the hot leg RTD or Sample/PT nozzle design details. The changes implemented in this NCP will have no effect on the number or functionality of the hot leg instrumentation or Sampling. Therefore, this modification will not cause information contained in the ANO-2 Technical Specifications, Operating License or confirmatory Orders to be untrue or inaccurate. The changes provided by this NCP will insure that these nozzles will be in compliance with T.S. 3.4.6.2, "Reactor Coolant System Leakage" and TS 3/4.4.10, "Structural Integrity".

Question 2: The changes described in this NCP result in hot leg nozzles that have a configuration that is slightly different than the original nozzle configuration. However, the level of detail in the Core Operating Limits Report, Fire Hazards Analysis, Bases of the Technical Specifications or NRC Safety Evaluation Reports does not describe the current configuration of these Hot Leg nozzles. As such, no changes to these ANO-2 documents are required.

The proposed change affects the ANO-2 SAR in that RCS piping materials now come in contact with the RCS fluid, contrary to Table 5.2-3. This condition has been evaluated and determined to be acceptable. In addition, these replacements meet all ASME Section III, Class 1 and Section XI Code requirements. An LDCR is being submitted as part of this NCP.

Question 3: The changes implemented by this NCP are limited to the replacement of Sample/PT and the modified RTD nozzles on the RCS hot leg piping. The replacement nozzle configuration is changed by upgrading the nozzle to Alloy 690 material and relocating the pressure boundary to the outer surface of the RCS pipe at the nozzle/pipe interface. The replacement nozzles are of similar design and serve the same design function as the original nozzles. These nozzle replacements do not constitute a test or experiment not described in the SAR.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # ____. (If checked, note appropriate item #, send LDCR to Licensing).

JCK 9-27-00

Document No. ER002795N202 Rev./Change No. 0

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document	Section
LRS: ANO-2 50.59	(Hot Leg Temperature), (Hot Leg Sample), (Leg w/5 RTD), (Leg w/5 Sample), (RCS Materials), (2TE-4610*), (2TE-4635*), (2TE-4710*), (2TE-4735*), (Inconel), (Corrosion), (Clad*) (PPS), (Plant Protective System), (RRS), (Reactor Regulating System), (Structural Integrity), (Stainless), (Well), (Thermal), (Thermo), (Sample/PT Nozzle), (RTD), (Resistance Temperature Detector), (Contact With), (Alloy 600), PWSCC), (Corrosion Cracking), (Weld w/30 nozzle or RTD), (Response w/30 RTD), (Design Transients w/30 RCS), (Fatigue w/30 RCS or RTD)
MANUAL SECTIONS:	Table 3.2-2, Table 3.2-3, Table 3.2-4, Table 5.1-1, Table 5.2-1, Table 5.2-3, Table 5.2-9, Table 5.5-4, Table 5.5-5, Table 5.6-1, Table 7.2-2, Table 7.2-3, Table 7.2-5, SAR 3.6.4.2.1.1, SAR 3.7.3.4.2.1, SAR 5.1, SAR 5.2.1.5, SAR 5.2.3.2, SAR 5.2.3.3, SAR 5.2.5.5, SAR 5.5.3.2, SAR5.6.1.1, SAR 7.2.1.1.2.4, SAR 7.2.1.1.2.5.1.3, SAR 7.7.1.3.3.2, SAR Sections 7.2 thru 7.6, TS 3/4.4.10
FIGURES:	Figure 5.1-1, Figure 5.1-2, Figure 5.1-3, Figure 7.6-3, Figure 7.2-29

William R Rowlett, Jr. — Certified Reviewer's Signature

William R. Rowlett, Jr. — Printed Name

9/27/2000 — Date

Reviewer's certification expiration date: 5/25/2001

Assistance provided by:

Printed Name	Scope of Assistance	Date

Search Scope Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

Joseph C King Jr — Certified Reviewer's Signature

Joseph C. King Jr. — Printed Name

9/27/00 — Date

ENVIRONMENTAL IMPACT DETERMINATION
(UNIT 1 and UNIT 2)

Document No. ER002795N202 Rev./Change No. 0

Complete the following Determination. If the answer to any item below is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

failure of these hot leg RTD or Sample/ PT nozzles that results in a small break LOCA. The worst case scenario would be a weld failure in which the nozzle is ejected from the RCS piping. The diameter of the nozzle that penetrates the RCS piping is unchanged from the original design. A failure of the replacement nozzle would result in the same consequences as a failure of the original nozzle. Since the consequences of the applicable accident are bounded by the existing analysis, the consequences of an accident previously evaluated in the SAR are not increased.

3. Will the probability of a malfunction of equipment important to safety be increased? Yes ☐ No ☒

The RCS hot leg piping is considered equipment important to safety. The hot leg Sample-PT / RTD nozzles are considered part of the RCS pressure boundary and are therefore classified as equipment important to safety. The replacement hot leg nozzle configuration will be in compliance with the ASME Section III, Class 1 Code and is structurally sound. The replacement nozzle configuration will not introduce any new loads on the RCS piping. The natural frequency of the replacement nozzle assembly, which will be welded on the exterior of the RCS pipe, will be minimally impacted by this replacement, and therefore will not be excited by the RCP running frequencies. Testing ensures that the nozzle replacements will not change the RTD response time properties. This modification does not affect the normal function of the parent RCS or negatively impact the containment isolation function. The modification will not have a negative impact on the previously installed equipment and does not increase the probability of any equipment or system malfunction. Therefore, the probability of a malfunction of equipment important to safety will not be increased.

4. Will the consequences of a malfunction of equipment important to safety be increased? Yes ☐ No ☒

Replacing these Alloy 600 nozzles, which have a history of leaking due to PWSCC, with Alloy 690 nozz will eliminate RCS pressure boundary leakage concerns at these nozzles. This change does not mod existing release paths or create new ones that could worsen the consequences of an equipment malfunction. The worst case malfunction of these hot leg nozzles would be a weld failure in which the nozzle is ejected from the RCS piping. The diameter of the bore that penetrates the RCS piping is the same as the original designs. A failure of the replacement nozzle would result in the same consequences as a failure of the original nozzle. Therefore, the consequences of a malfunction of equipment important to safety will not be increased. This modification does not have a negative impact on previously installed equipment and does not increase the consequence of any equipment or system malfunction. The modification does not change the operational or performance characteristics of any equipment important to safety or preclude the necessary operation of equipment important to safety.

5. Will the possibility of an accident of a different type than any previously evaluated in the SAR be created? Yes ☐ No ☒

The activity is limited to subtle changes to the existing hot leg nozzle configuration. The worst case postulated accident associated with these replacement hot leg nozzles would be a failure in which the nozzle is ejected from the RCS piping. Plausible accident scenarios associated with this feature of the plant are bounded by the existing small break LOCA analysis. Therefore, the possibility of an accident of a different type than that previously evaluated in the SAR will not be created as a result of the installation of these replacement hot leg instrumentation and sample nozzles.

6. Will the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR be created? Yes ☐ No ☒

No new equipment interrelationships or potential interactions are created by the activity. As discussed above, the exposure of RCS hot leg piping material to RCS fluid will not result in rates of corrosion that would compromise the integrity of the piping or replacement nozzles. The final configuration will be structurally equivalent to the original nozzles.

FENB

10CFR50.59 Eval. No. 00-111
(Assigned by PSC)

Document No. **ER002795N202** Rev./Change No. **0**

PAGE 8 REV. 0

Title **2R14 Replacement of Alloy 600 RTD and Sample/PT Nozzles**

A WRITTEN RESPONSE PROVIDING THE BASIS FOR THE ANSWER TO EACH QUESTION MUST BE ATTACHED. EACH QUESTION MUST BE ANSWERED SEPARATELY. A SIMPLE STATEMENT OF CONCLUSION IS NOT SUFFICIENT. ATTACHMENT 2 PROVIDES GUIDANCE FOR RESPONSE.

Brief description of proposed change: Nuclear Change ER002795N202 provides the modification package for the replacement of the modified RTDs and the sample Alloy 600 nozzles which are on the RCS hot legs. The replacement nozzles will be made of Alloy 690 material which is more resistant to Primary Water Stress Corrosion Cracking (PWSCC) than the original Alloy 600 material. The replacement nozzle configuration will add an external weld to the O.D. of the RCS pipe to nozzle interface and will leave a remnant of the original nozzle in the RCS pipe with the internal J-weld. This configuration moves the pressure boundary between the nozzle and the hot leg to the outside surface of the pipe and permits RCS fluid to come into contact with the unclad carbon steel piping material. This type of contact was intentionally avoided in the original design as noted in SAR Section 5.2.3.2 and Table 5.2-3. This condition has previously been evaluated in many industry and ANO documents. The most recent evaluation (FTI Document 51-5007187-00, ANO Calculation 86-E-0074-143), determined that this exposure will not result in rates of corrosion that would compromise the integrity of the RCS piping or replacement nozzles. This document cites a repair to pressurizer heater nozzles at Calvert Cliffs Unit 2 in 1994 that resulted in similar contact. The replacement configuration will be ASME Class 1 code qualified and structurally equivalent to the original configuration with respect to RCS pressure boundary considerations and seismic qualification.

If the answer to any question on this form is "Yes," then an unreviewed safety question is involved. If the answer to all questions is "No," then the proposed change does not involve an unreviewed safety question.

1. Will the probability of an accident previously evaluated in the SAR be increased?

   Yes ☐ No ☒

   The replacement hot leg nozzle configuration is code-qualified and structurally equivalent to the original configuration. The configuration of the replacement nozzle will result in an area of unclad carbon steel piping between the remnant of the original nozzle and the new replacement new nozzle. This will allow reactor coolant to contact the carbon steel hot leg piping in the gap between the two nozzle sections. The potential for material degradation due to reactor coolant being in contact with carbon steel has been previously evaluated in multiple industry and ANO documents. The most recent evaluation is FTI Document 51-5007187-00 (ANO Calculation 86-E-0074-143). Based on these evaluations the corrosion rates for carbon steel and Alloy 600 materials exposed to reactor coolant are minimal. The pressure boundary weld on the replacement nozzle will be equivalent to the pressure boundary weld on the original nozzle. The replacement nozzle will meet all Class 1 requirements of the ASME code. The postulated accident applicable to the hot leg Sample/ PT or RTD nozzles is a guillotine failure of the nozzle, which results in a small break LOCA. The replacement nozzle does not introduce any new unanalyzed failure modes and the likelihood of a failure is not increased as a result of the installation of these replacement nozzles. Therefore, the probability of an accident previously evaluated in the SAR is not increased due to this modification of these hot leg nozzles. As discussed above, the exposure of piping material to RCS fluid will not result in adverse rates of corrosion that would compromise the integrity of the hot leg piping. As such, there is no adverse impact upon the RCS pressure boundary, and the probability of an accident previously evaluated in the SAR, such as a small break LOCA is not increased.

2. Will the consequences of an accident previously evaluated in the SAR be increased?

   Yes ☐ No ☒

   The replacement activities will not degrade the capability of the RCS to act as a fission product barrier since the pressure boundary integrity is not compromised by the change. The applicable accident is a guillotine

7. Will the margin of safety as defined in the basis for any technical specification be reduced? Yes ☐ No ☒

These activities insure the compliance with Technical Specifications 3.4.6.2 & 3.4.10.1, which require zero pressure boundary leakage and structural integrity of ASME Code Class 1, 2, & 3 components respectively. The Technical Specification 3/4.4.6.2 bases reflect the need to reduce RCS leakage to low levels. There are no specific Technical Specifications related to how these hot leg nozzles are attached to the RCS piping. These replacement nozzles will have non-destructive examinations in accordance with code requirements. This will provide a level of assurance against pressure boundary failure equivalent to the rest of the RCS piping and equal to the original nozzle installation. Moving the pressure boundary to the weld at the interface between the exterior surface of the RCS piping and nozzle does not affect the operation of the parent RCS or containment isolation functions.

William R Rowlett Jr. — Certified Reviewer's Signature

William R. Rowlett, Jr. — Printed Name

9/27/00 — Date

Reviewer's certification expiration date: 5/25/2001

Assistance provided by:

Printed Name	Scope of Assistance	Date

PSC review by: [signature] Date: 9/27/00

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ENVIRONMENTAL IMPACT DETERMINATION (UNIT 1 and UNIT 2)

Document No. ER 002796N201 Rev./Change No. 0

Complete the following Determination. If the answer to any checklist item is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

PAGE 6 REV. 0

10CFR50.59 Eval. No. FFN # 00-084
(Assigned by PSC)

Document No. ER 002796N201 Rev./Change No. 0

Title Leak Repair of Pressurizer Heater Nozzles

A WRITTEN RESPONSE PROVIDING THE BASIS FOR THE ANSWER TO EACH QUESTION MUST BE ATTACHED. EACH QUESTION MUST BE ANSWERED SEPARATELY. A SIMPLE STATEMENT OF CONCLUSION IS NOT SUFFICIENT. ATTACHMENT 2 PROVIDES GUIDANCE FOR RESPONSE.

Brief description of proposed change: This ANO-2 Nuclear Change Package authorizes a code repair of 12 pressurizer heater sleeve nozzles that have developed leaks where the sleeves are welded to the interior cladding of the pressurizer vessel. The repair consists of removing 8 backup heaters from service (the remaining 4 heater sleeve nozzles do not house active heaters) and permanently plugging all 12 heater sleeves. The existing Ni-Cr-Fe Alloy 600 heater sleeves will be partially removed by cutting, new Ni-Cr-Fe Alloy 690 heater sleeve plugs will be inserted, and the 12 penetrations will be partially covered by weld overlay.

The resulting configuration will be in conformance with the ASME Section III, 1989 edition of the code. It will be qualified and structurally equivalent or stronger than the original configuration with respect to RCS pressure boundary considerations, fatigue cycles, seismic qualification, etc. A minor change is introduced in that the repair moves the pressure boundary between the heater sleeve and the pressurizer to the outside surface of the shell, thereby permitting RCS fluid to come into contact with the shell material. This type of contact was intentionally avoided in the original design as noted in SAR Section 5.2.3.2 and Table 5.2-3. However, as discussed in FTI Document 51-5007187-00 (ANO Calculation 86-E-0074-143), "Corrosion Evaluation for Hot Leg Level Tap Nozzle Repair ANO-1," the exposure will not result in adverse rates of corrosion that would compromise the integrity of the vessel or repair site. This document cites a repair to pressurizer heater nozzles at Calvert Cliffs Unit 2 in 1994 that resulted in similar contact. Further, this document has been reviewed, and is equally applicable to ANO Unit 2 as well.

The removal of 8 backup heaters will have no impact upon the ANO-2 safety analyses since they are not credited for preventing or mitigating the consequences of any analyzed accident scenario. The proportional heaters are credited in some analyses, but these are not affected by the proposed changes. The backup heater capacity and control settings are associated with plant maneuverability or load following characteristics as discussed in SAR Section 5.3.5, but the elimination of the 8 heaters, or roughly 100 kW of capacity, will have no significant detrimental impact upon plant's existing capabilities as documented in the NCP.

If the answer to any question on this form is "Yes," then an unreviewed safety question is involved. If the answer to all questions is "No," then the proposed change does not involve an unreviewed safety question.

1. Will the probability of an accident previously evaluated in the SAR be increased?

   Yes ☐ No ☒

   The proposed repairs to the identified 12 heater sleeve nozzles will restore the integrity of the pressurizer in accordance with ASME code. As discussed above, previous corrosion analysis has determined that the exposure of pressurizer shell material to RCS fluid will not result in adverse rates of corrosion that would compromise the integrity of the vessel or repair site. As such, there is no adverse impact upon the RCS pressure boundary, and the probability of an accident such as a SBLOCA is not increased. Integrated plant operation and maneuvering capabilities are not significantly altered by the removal of the 8 backup heaters; therefore, the likelihood of initiating or preventing a plant transient is also not significantly increased.

2. Will the consequences of an accident previously evaluated in the SAR be increased?

   Yes ☐ No ☒

   The proposed repairs will not degrade the capability of the RCS to act as a fission product barrier because the pressure boundary is not compromised by the changes, and the pressurizer backup heaters are not credited for any purpose in the accident analyses that would mitigate offsite dose consequences.

Document No. ER 002796N201 Rev./Change No. 0

Title Leak Repair of Pressurizer Heater Nozzles

Brief description of proposed change: This ANO-2 NCP authorizes a code repair of 12 pressurizer heater sleeve nozzles that have developed leaks where the nozzles are welded to the interior cladding of the pressurizer vessel. The repair consists of removing 8 backup heaters from service (the remaining 4 nozzles do not house active heaters) and permanently plugging all 12 heater sleeve nozzles. The existing Alloy 600 heater sleeves will be partially removed by cutting, new Alloy 690 heater plugs will be inserted, and the 12 heater sleeve penetrations will be covered by weld overlay.
Will the proposed Activity:

1. Require a change to the Operating License including:

   Technical Specifications (excluding the bases)? Yes☐ No☒

   Operating License? Yes☐ No☒

   Confirmatory Orders? Yes☐ No☒

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:

   SAR (multi-volume set for each unit)? Yes☒ No☐

   Core Operating Limits Report Yes☐ No☒

   Fire Hazards Analysis? Yes☐ No☒

   Bases of the Technical Specifications? Yes☐ No☒

   Technical Requirements Manual? Yes☐ No☒

   NRC Safety Evaluation Reports? Yes☐ No☒

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒

4. Result in a potential impact to the environment? (Complete the Environmental Impact Determination of this form.) Yes☐ No☒

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7:

   QAPM? Yes☐ No☒

   E-Plan? Yes☐ No☒

8. Does this review depend on future NRC approval of other actions (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No☒

Document No. **ER 002796N201** Rev./Change No. **0**

Basis for Determination (Questions 1, 2 & 3):

1. The ANO-2 Technical Specifications, Operating License, and Confirmatory Orders do not specifically address pressurizer heater sleeve nozzles or backup heaters. T.S. 3.4.4 does require that both proportional heater banks be operable in Modes 1, 2, & 3. Repair of the leaking nozzles in accordance with the ASME Code will bring them into compliance with T.S. 3.4.6.2, "Reactor Coolant System Leakage" and T.S. 3.4.10.1, "Structural Integrity".

2. The change affects the ANO-2 SAR in that (a) RCS fluid will now come into contact with pressurizer shell material contrary to Table 5.2-3, and (b) the installed number and maximum permissible number of heaters and their associated heat addition rates are reduced from what is described in Section 5.5.10, Tables 5.3-2 and 5.5-6, and Figure 5.5-8.

3. The activity is limited to ASME code repair of the pressurizer heater sleeve nozzles and a reduction in the number of active pressurizer backup heaters. As such, it does not constitute a test or experiment not described in the SAR.

☐ **Proposed change does not require 10 CFR 50.59 Evaluation per Attachment 1, Item #___, (If checked, note appropriate item #, send LDCR to Licensing).**

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in Question 1, 2 and 3. If a search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document	Section
LRS:	50.59 – Unit 2 (pressurizer w/50 heater or nozzle; sleeve w/50 heater; "alloy 600"; PWSCC; "corrosion cracking"; weld" w/30 nozzle or sleeve; leak w/50 pressurizer or heater or sleeve)
MANUAL SECTIONS:	ANO-2 SAR: Section 5 (all including tables), 7.7, Table 8.3-1; ANO-2 T.S. 3.4.4, 3.4.6.2, 3.4.10.1
FIGURES:	ANO-2 SAR: Section 5 figures (all)

Edward Paul Blackard — Edward Paul Blackard — 8/3/00
Certified Reviewer's Signature — Printed Name — Date

Reviewer's certification expiration date: 3/22/01

Assistance provided by:

Printed Name	Scope of Assistance	Date

Search Scope Review Acceptability (NA, if performed by Technical Review per 1000.006)

Joseph C. King — Joe King — 8/4/00
Certified Reviewer's Signature — Printed Name — Date

3. Will the probability of a malfunction of equipment important to safety be increased?

Yes ☐ No ☒

The pressurizer is considered equipment important to safety, but the backup heaters are not. Removal of the backup heaters will not adversely affect operability of the pressurizer or the proportional heaters or increase their likelihood of malfunction. The backup heaters are electrically separated from the proportional heaters. With the backup heaters removed and heater sleeve plugs installed, the integrity of the pressurizer is maintained in accordance with ASME code.

4. Will the consequences of a malfunction of equipment important to safety be increased?

Yes ☐ No ☒

The repair activities restore the integrity of an existing RCS pressure boundary and do not modify existing release paths or create new ones that could worsen the consequences of an equipment function. Only the proportional heaters are credited in some of the safety analyses, and they are unaffected by the change.

5. Will the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Yes ☐ No ☒

The activity is limited to removing eight backup pressurizer heaters from service and moving the pressure boundary weld from inside the pressurizer to the outside surface on each of these heater sleeves. Complete failure of the heater sleeve plug would be bounded by the existing SBLOCA analysis.

6. Will the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR be created?

Yes ☐ No ☒

No new equipment interrelationships or potential interactions are created by the proposed changes. As discussed above, the exposure of pressurizer shell material to RCS fluid will not result in adverse rates of corrosion that would compromise the integrity of the pressure vessel or repair site. The final configuration will be structurally equivalent or better than the original design of the heater sleeve nozzles.

7. Will the margin of safety as defined in the basis for any technical specification be reduced?

Yes ☐ No ☒

Technical Specification 3.4.4, "Pressurizer" requires a water volume of ≤ 910 cubic feet and both proportional heater banks for pressurizer operability. Neither the technical specification nor its basis credits operation of the backup heaters. The proposed repairs restore compliance with Technical Specifications 3.4.6.2 & 3.4.10.1 that require zero pressure boundary leakage and structural integrity of ASME Code Class 1, 2, & 3 components respectively.

Edward Paul Blackard — Edward Paul Blackard — 8/3/00

Certified Reviewer's Signature | Printed Name | Date

Reviewer's certification expiration date: 3/22/01

Assistance provided by:

Printed Name	Scope of Assistance	Date

PSC review by: Michael O Hatcher Date: 8/4/00

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FORM TITLE: 10CFR50.59 DETERMINATION	FORM NO. 1000.131A	REV. 003-04-0

PAGE 3 REV. 0

This Document contains 3 Pages.

Document No. ER002796N202 Rev./Change No. 0

Title PRESSURIZER HEATER REPAIR

Brief description of proposed change:

During the recent 2P2K outage, eight (8) pressurizer heaters and four (4) dummy heaters were plugged because of leaks. This Modification authorizes the restoration of the remaining twelve (12) dummy heaters to active backup heaters and repair one (1) active heater in the backup heater banks. This will restore all the original backup pressurizer heaters to active status. These heaters are 2EHTR-AA2, -C2, -L1, -L2, -M1, -P3, -T1, -T3, -U3, -V2, -W3, -Y2 and -Y3. This modification also updates WMS for heaters plugged per ER002796N201 and deletes 2EHTR-A2, -AA3, -AA4, -B1, -B2, -B3, -B4, -C3, -D2, -D3, -D4, and -G2.

Will the proposed Activity:

1. Require a change to the Operating License including:

   Technical Specifications (excluding the bases)? Yes☐ No☒

   Operating License? Yes☐ No☒

   Confirmatory Orders? Yes☐ No☒

2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:

   SAR (multi-volume set for each unit)? Yes☒ No☐

   Core Operating Limits Report? Yes☐ No☒

   Fire Hazards Analysis? Yes☐ No☒

   Bases of the Technical Specifications? Yes☐ No☒

   Technical Requirements Manual? Yes☐ No☒

   NRC Safety Evaluation Reports? Yes☐ No☒

3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒

4. Result in a potential impact to the environment? (Complete Environmental Impact Determination of this form.) Yes☐ No☒

5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒

6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒

7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7?

   QAPM? Yes☐ No☒

   E-Plan? Yes☐ No☒

8. Does this review depend on future NRC approval of other actions? (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No☒

Document No. ER002796N202 Rev./Change No. 0

Basis for Determination (Questions 1, 2, & 3): PAGE 4 REV. 0

This modification will electrically restore and re-connect twelve (12) backup pressurizer heaters and repair one (1) backup pressurizer heater. A review of the Plant Operating License documents found no impact associated with this package. A review of the Safety Analysis documents found mention of the total number of Pressurizer Heaters and available heating capacity in Section 5.5.10.2 and Tables 5.3-2 and 5.5-6. This number had been reduced by 9 to (69) per LDCR for ER002796E201. A Licensing Document Changer Request is submitted to increase this number to (82) with the restoration of (12) backup heaters, and the repair of one (1) heater. Since this modification only adds (12) backup heaters, repairs one (1) and deletes twelve (12) from the WMS database, the proportional (safety related) heaters remain unchanged, and remain thoroughly bound by SAR accident analysis. Additionally, this change does not constitute a test nor an experiment not already described in the Safety Analysis Report.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # ___, (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document Section

LRS: Unit 2 - 50.59, All Correspondence (2EHTR, pressurizer heater, pressurizer backup, pressurizer capacity, backup heaters, heater capacity)

MANUAL SECTIONS: 5.5.10.2, 7.7.1.1.2, Table 5.3-2, Table 5.5-6

FIGURES: 8.3-20

Douglas A. Bruce — Douglas A. Bruce — 9/11/00
Certified Reviewer's Signature — Printed Name — Date

Reviewer's certification expiration date: 2/25/01

Assistance provided by:

Printed Name	Scope of Assistance	Date

Search Scope Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

Robert J Buser — Robert Buser — 9/21/00
Certified Reviewer's Signature — Printed Name — Date

ENVIRONMENTAL IMPACT DETERMINATION
(UNIT 1 and UNIT 2)

Document No. ER002796N202 Rev./Change No. 0

Complete the following Determination. If the answer to any item below is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

PAGE 6 REV. 0

This Document contains 2 Pages.

Document No. ER002796N202 Rev./Change No. 0 10CFR50.59 Eval. No. FFN#00-116 (Assigned by PSC)

Title PRESSURIZER HEATER REPAIR

A WRITTEN RESPONSE PROVIDING THE BASIS FOR THE ANSWER TO EACH QUESTION MUST BE ATTACHED. EACH QUESTION MUST BE ANSWERED SEPARATELY. A SIMPLE STATEMENT OF CONCLUSION IS NOT SUFFICIENT. ATTACHMENT 2 PROVIDES GUIDANCE FOR RESPONSE.

If the answer to any question on this form is "Yes," then an unreviewed safety question is involved. If the answer to all questions is "No," then the proposed change does not involve an unreviewed safety question.

1. Will the probability of an accident previously evaluated in the SAR be increased? Yes ☐ No ☒

   The accident analysis for Unit 2 SAR does not consider the Pressurizer Backup Heaters. The accident initiators evalued in the SAR accident analyses are not affected by the restoration of the Backup Heaters. This modification does not invalidate the failure modes outlined in the SAR, nor does this activity increase the frequency of any accident initiator. Therefore, the probability of an accident previously evaluated in the SAR is not increased.

2. Will the consequences of an accident previously evaluated in the SAR be increased? Yes ☐ No ☒

   The restoration and addition of Backup Heaters does not affect the consequences of any previously evaluated accident. This ER does not invalidate any accident assumption nor consequences outlined in the SAR. Offsite dose rates are unaffected by this modification. Therefore, the consequences of an accident previously evaluated in the SAR are not increased by this modification.

3. Will the probability of a malfunction of equipment important to safety be increased? Yes ☐ No ☒

   This modification does not alter nor affect the function or capability of any equipment required to perform a safety related function. The restoration of Backup heaters previously removed and evaluated per FFN#00-085 does not affect the operation of any existing safety equipment as the proportional heaters remain unaffected. This modification has no impact on system reliability, separation, seismic features, specification or safety loads. Therefore, the probability of a malfunction of equipment important to safety remains unchanged.

4. Will the consequences of a malfunction of equipment important to safety be increased? Yes ☐ No ☒

   This modification adds and restores backup heaters in the Unit 2 pressurizer within the pressure boundary, and as such has no impact on potential radiological releases. This modification does not impact equipment such that offsite dose rates are increased. Therefore, the consequences of a malfunction of equipment important to safety are not increased.

5. Will the possibility of an accident of a different type than any previously evaluated in the SAR be created? Yes ☐ No ☒

   Restoration of backup pressurizer heaters cannot become initiators of any new type of accident previously evaluated in SAR. The system has

PAGE 7 REV. 0

been previously evaluated and is bounded by existing accident analyses previously evaluated. Therefore, the possibility of an accident of a different type than any previously evaluated in the SAR is not created by this modification.

6. Will the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR be created? Yes ☐ No ☒

   The ability of the safety related proportional heaters to perform their safety related functions are not compromised by this modification. The restoration of backup heaters creates no new equipment failures nor failure scenarios. The existing Unit 2 SAR failure analysis therefore bounds this condition to where the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR is not created.

7. Will the margin of safety as defined in the basis for any technical specification be reduced? Yes ☐ No ☒

   The backup pressurizer heaters are not discussed in the bases for any Tech Spec reviewed. Restoring these heaters will not impact any Tech Spec bases, and therefore the margin of safety is not reduced.

Certified Reviewer's Signature	Douglas A. Bruce Printed Name	9-11-00 Date

Reviewer's certification expiration date: 2/25/01

Assistance provided by:

Printed Name	Scope of Assistance	Date

PSC review by: _____ Date: 9/25/00

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FORM TITLE:	FORM NO.	REV.
10CFR50.59 DETERMINATION	1000.131A	003-04-0

This Document contains 3 Pages.

Document No. ER002804E203 Rev./Change No. 0

Title Evaluate Balance Drum and Sleeve for Material Substitution

Brief description of proposed change:

This evaluation concerns the replacement of certain HPSI pump wetted components with a material different than that originally provided. The change is necessary due to obsolescence and unavailability of the original material.

Will the proposed Activity:

1. Require a change to the Operating License including:
   - Technical Specifications (excluding the bases)? Yes☐ No☒
   - Operating License? Yes☐ No☒
   - Confirmatory Orders? Yes☐ No☒
2. Result in information in the following SAR documents (including drawings and text) being (a) no longer true or accurate, or (b) violate a requirement stated in the document:
   - SAR (multi-volume set for each unit)? Yes☒ No☐
   - Core Operating Limits Report? Yes☐ No☒
   - Fire Hazards Analysis? Yes☐ No☒
   - Bases of the Technical Specifications? Yes☐ No☒
   - Technical Requirements Manual? Yes☐ No☒
   - NRC Safety Evaluation Reports? Yes☐ No☒
3. Involve a test or experiment not described in the SAR? (See Attachment 2 for guidance) Yes☐ No☒
4. Result in a potential impact to the environment? (Complete Environmental Impact Determination of this form.) Yes☐ No☒
5. Result in the need for a Radiological Safety Evaluation per section 6.1.5? Yes☐ No☒
6. Result in any potential impact to the equipment or facilities utilized for Ventilated Storage Cask activities per Section 6.1.6? Yes☐ No☒
7. Involve a change under 10CFR50.54 for the following SAR documents per Section 6.1.7?
   - QAPM? Yes☐ No☒
   - E-Plan? Yes☐ No☒
8. Does this review depend on future NRC approval of other actions? (NRC SER, Relief, etc)? (forward change to PSC per 6.3.8 or 6.3.9) Yes☐ No☒

Document No. ER002804E203 Rev./Change No. 0

Basis for Determination (Questions 1, 2, & 3):

Question 1 – The operating license does not describe pump construction details. No change to the operating license is required.

Question 2 – The SAR documents were reviewed and information was discovered such that the proposed changes would cause certain SAR statements to be untrue or inaccurate. Certain replacement materials are martensitic stainless steel in contrast to the description of existing components in contact with the RCS as austenitic stainless steel. This issue has already been addressed via an LDCR generated in conjunction with the development of ER002804N201.

Question 3 – No test or experiment not described in the SAR will be introduced by this change. Post maintenance testing will consist of previously established test methods and procedures.

☐ Proposed change does not require 10CFR50.59 Evaluation per Attachment 1, Item # ____. (If checked, note appropriate item #, send LDCR to Licensing).

Search Scope:

List sections reviewed in the Licensing Basis Documents specified in questions 1, 2 and 3. If search was performed on LRS, the LRS search index should be entered under "Section" with the search statement(s) used in parentheses. Controlled hard copies of the documents shall be reviewed (LRS is not verified and searches only text, not figures or drawings). **Attach and distribute a completed LDCR per Section 6.1.2 if LBD changes are required.**

Document	Section
LRS: All (keywords of HPSI w/10 pump, austenitic, martensitic, high pressure safety injection, 2P-89A, 2P-89B, 2P-89C)	
MANUAL SECTIONS: Section 6	
FIGURES: Table 6.3-1 and Figures 6.3-3 and 6.3-4	

Stephen J. Lynn — Stephen J. Lynn — 10-31-00
Certified Reviewer's Signature — Printed Name — Date

Reviewer's certification expiration date: 5/26/01

Assistance provided by:

Printed Name	Scope of Assistance	Date
Randall S. Smith	LRS	10/11/00

Search Scope Review Acceptability (NA, if performed by Technical Reviewer per 1000.006)

M. Keith Butler — Michael Keith Butler — 10-31-00
Certified Reviewer's Signature — Printed Name — Date

ENVIRONMENTAL IMPACT DETERMINATION
(UNIT 1 and UNIT 2)

Document No. ER002804E203 Rev./Change No. 0

Complete the following Determination. If the answer to any item below is "Yes", an Environmental Evaluation is required. See Section 6.1.4 for additional guidance.

Will the Activity being evaluated:

Yes	No	
☐	☒	Disturb land that is beyond that initially disturbed during construction (i.e., new construction of buildings, creation or removal of ponds, or other terrestrial impact)? See Unit 2 SAR Figure 2.5-17. This applies only to areas outside the protected area.
☐	☒	Increase thermal discharges to lake or atmosphere?
☐	☒	Increase concentration of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Increase quantity of chemicals to cooling lake or atmosphere through discharge canal or tower?
☐	☒	Modify the design or operation of cooling tower which will change drift characteristics?
☐	☒	Install any new transmission lines leading offsite?
☐	☒	Change the design or operation of the intake or discharge structures?
☐	☒	Discharges any chemicals new or different from that previously discharged?
☐	☒	Potentially cause a spill or unevaluated discharge which may effect neighboring soils, surface water or ground water?
☐	☒	Involve burying or placement of any solid wastes in the site area which may effect runoff, surface water or ground water?
☐	☒	Involve incineration or disposal of any potentially hazardous materials on the ANO site?
☐	☒	Result in a change to nonradiological effluents or licensed reactor power level?
☐	☒	Potentially change the type or increase the amount of non-radiological air emissions from the ANO site.

FORM TITLE: 10CFR50.59 SAFETY EVALUATION	FORM NO. 1000.131B	REV. 003-04-0

This Document contains 1 Page.

Document No. ER002804E203 Rev./Change No. 0 10CFR50.59 Eval. No. FFN#00-136 (Assigned by PSC)

Title Evaluate Balance Drum and Sleeve for Material Substitution

A WRITTEN RESPONSE PROVIDING THE BASIS FOR THE ANSWER TO EACH QUESTION MUST BE ATTACHED. EACH QUESTION MUST BE ANSWERED SEPARATELY. A SIMPLE STATEMENT OF CONCLUSION IS NOT SUFFICIENT. ATTACHMENT 2 PROVIDES GUIDANCE FOR RESPONSE.

If the answer to any question on this form is "Yes," then an unreviewed safety question is involved. If the answer to all questions is "No," then the proposed change does not involve an unreviewed safety question.

1. Will the probability of an accident previously evaluated in the SAR be increased? Yes ☐ No ☒
2. Will the consequences of an accident previously evaluated in the SAR be increased? Yes ☐ No ☒
3. Will the probability of a malfunction of equipment important to safety be increased? Yes ☐ No ☒
4. Will the consequences of a malfunction of equipment important to safety be increased? Yes ☐ No ☒
5. Will the possibility of an accident of a different type than any previously evaluated in the SAR be created? Yes ☐ No ☒
6. Will the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR be created? Yes ☐ No ☒
7. Will the margin of safety as defined in the basis for any technical specification be reduced? Yes ☐ No ☒

Stephen J. Lynn — Certified Reviewer's Signature

Stephen J. Lynn — Printed Name

10-31-00 — Date

Reviewer's certification expiration date: 5/26/01

Assistance provided by:

Printed Name	Scope of Assistance	Date
Randall S. Smith	LRS Search	

PSC review by: [signature] Date: 11/10/00

Document No. ER002804E203 Rev./Change No. 0

10CFR50.59 Review Continuation Page

Background

The ANO-2 HPSI pumps are Class 2 components which function to inject borated water into the RCS if a break occurs in the RCS pressure boundary. The HPSI pumps are also used during recirculation to maintain a water circulation through the core for extended periods of time following a LOCA.

Modification Scope

This evaluation concerns the replacement of certain HPSI pump wetted components with a material different than that originally provided. The change is necessary due to obsolescence and unavailability of the original material.

Basis for Design Acceptability

The replacement materials meet or exceed the original design criteria for the affected pump components. No limitations or restrictions will be imposed by this change.

The change is internal to the HPSI pump assembly. The HPSI system is affected only in the sense of anticipated reduction in maintenance activities associated with the pump. The electrical supply system is unaffected because the changes are not expected to result in any detectable change in the power consumption levels for starting or operation at any flow point. No other SSC is affected by any of these changes.

Design margin for the ANO-2 HPSI pumps is defined in terms of minimum required hydraulic performance in the ANO-2 Technical Specifications and the ANO-2 SAR.

Materials Discussion

SAR section 6.3.2.4, "Materials Specifications and Compatibility", states that "Basically all materials in contact with radioactive coolant are austenitic stainless steel... ", while section 6.3.2.19, "Materials" states "....the components of the SIS are fabricated of austenitic stainless steel...". The use of the word austenitic causes the need for a SAR change to accommodate the martensitic steel to be substituted for the original material of the subject pump components. That SAR change has previously been initiated via an LDCR associated ER002804N201.

Additionally, Section 6.3.2.2.4, "High Pressure Safety Injection Pumps", states "The pressure containing parts of the pump are stainless steel with internals selected for compatibility with boric acid solutions. The materials selected are analyzed to ensure that differential expansion during the design transients can be accommodated." Finally, Table 6.3-1 identifies the pump material as Stainless Steel, ASTM-A-351 Gr CF8M. These sections will not require revision to accommodate new materials.

Operational Considerations

- No change to emergency and abnormal operating modes is created by this change.
- The ANO-2 HPSI pumps do not serve any function related to ANO-1. No shared systems and interfaces between Unit 1 and Unit 2 are affected by this change.
- The change in no way impacts single failure criteria for the HPSI pumps or their ability to meet that criteria. All three pumps will continue to be available for normal and emergency operation via either train of the HPSI system.
- The pump characteristic curve for any HPSI pump will not be affected. Power consumption also will not be affected by the changes described in this package.
- No new failure modes are introduced by this change.

Detemination of Unreviewed Safety Question

Question 1 Response:

This change affects specific HPSI pump components. No accident previously evaluated in the SAR is promulgated to a failure of a HPSI pump. The HPSI pumps are normally in a standby condition and are activated in response to accident conditions. Therefore, the probability of an accident previously evaluated in the SAR will not be increased.

Question 2 Response:

The hydraulic performance of the pump is not affected in terms of discharge head and pressure, nor are net positive suction head (NPSH) requirements increased. Therefore, the consequences of an accident previously evaluated in the SAR will not be increased.

Question 3 Response:

The modified pumps will continue to meet the operational aspects of the original design specification and the design margin as defined by the ANO-2 Technical Specifications and SAR documents. No other aspect of system operation is affected. Therefore, the probability of a malfunction of equipment important to safety will not be increased.

Question 4 Response:

The modifications are restricted to the pump itself with no impact or effect on any other SSC. The failure modes of a HPSI pump equipped with this component material is the same as those for a pump with the original pump (no flow, degraded flow, leakage). Therefore the consequences of a malfunction of equipment important to safety will not be increased.

Question 5 Response:

The HPSI pumps are not presently assigned any role in the initiation of any accident evaluated in the SAR. They are and will continue to be utilized strictly in a reactive mode as a tool in accident mitigation. Auto-start setpoints and criteria for securing a HPSI pump also remain unchanged. The change per this evaluation will be transparent to all HPSI and ECCS system functions. Therefore, the possibility of an accident of a different type than any previously evaluated in the SAR will not be created.

Question 6 Response:

The location, orientation, hydraulic performance, NPSH requirements/availability, power requirements and system interface remain unchanged. The ability to start and operate during a seismic event or at reduced motor supply voltages is not degraded as a result of this change. The debris passing capability is not reduced. Therefore, the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR will not be created.

Question 7 Response:

Start and run capability (including operation at reduced voltage and during seismic events), hydraulic performance (including operation at available NPSH), debris passing capability, tolerance to thermal transients, operation at vibration levels sufficiently low to ensure required mission time capability, internals resistance to corrosion and limited leakage (with or without a temporary loss of cooling water) are all implicit criteria serving to establish the margin of safety provided by the HPSI pumps. System requirements for limiting runout flow and providing proper flow splits and pump requirements for providing adequate flow are specifically addressed in the applicable Tech Spec bases. In each area, either a positive impact or no impact will be caused by this change. In all aspects, both specified and implied, the margin of safety as defined in the bases for any technical specification will not be reduced.

FORM TITLE: 10CFR50.59 REVISION	FORM NO. 1000.131D	REV. 003-04-0

This Document contains 1 Page.

Document No. ER002804E203 Rev./Change No. 1 10CFR50.59 Eval. No. FFN-00-136

Revision No. 1

This form is to be used to document Revisions to 10CFR50.59 Evaluations. Revisions to a 10CFR50.59 Evaluation after PSC review may become necessary due to SRC review, changes to the original document, etc. Refer to section 6.2.4 of this procedure for additional guidance.

Reason for revision to 10CFR50.59 Evaluation:

This revision was requested by the SRC 50.59 evaluation subcommittee. Revision 0 of this 50.59 evaluation, while not specifically stating so, relied upon the 50.59 evaluation generated for ER002804N201 which related to similar material substitution. Revision 0 of this evaluation therefore did not attempt to re-address the specifics of the material change in the evaluation. The LDCR generated as a result of ER002804N201 was specifically credited and remains so. This revision to FFN-00-136 still references that LDCR, but provides a stand alone evaluation with respect to the material substitution.

Will the proposed revision result in any additional:

1)	Change to the Operating License?	Yes ☐ No ☒
2)	Change to other Licensing Basis Document?	Yes ☐ No ☒
3)	Conduct of test or experiment?	Yes ☐ No ☒
4)	Impact to the environment?	Yes ☐ No ☒
5)	Need for a Radiological Safety Evaluation?	Yes ☐ No ☒
6)	Impact Ventilated Storage Cask Activities	Yes ☐ No ☒
7)	Impact the QAPM or E-Plan?	Yes ☐ No ☒

If yes, describe below and take appropriate action as per initial Determination:

N/A

Indicate revisions to the 10CFR50.59 Evaluation by placing revision number at the top right hand corner of each page of the form(s). Changes should be lined through, initialed, dated and indicated with the revision number. For extensive changes, new forms may be used with revision bars in the margin denoting changes. Attach this form to front of previous 10CFR50.59 Evaluation. Return to the PSC for review.

Stephen J. Lynn — Certified Reviewer's Signature

Stephen J. Lynn — Printed Name

3-13-01 — Date

Reviewer's certification expiration date: 5-26-01

PSC review: [signature] Date: 3/15/01

ER002804E203
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Detemination of Unreviewed Safety Question

Question 1 Response:
This nuclear change modifies specific HPSI pump components. No accident previously evaluated in the SAR is postulated due to a failure of a HPSI pump. The HPSI pumps are normally in a standby condition and are activated in response to accident conditions. The vendor recommended change in material for the subject pump internal components does not introduce any possibility to cause a change to that condition. Therefore, the probability of an accident previously evaluated in the SAR will not be increased.

Question 2 Response:
The hydraulic performance of the pump is not affected in terms of discharge head and pressure, nor are net positive suction head (NPSH) requirements increased. The change in balance sleeve and drum material introduces no new failure modes or effects for the HPSI pumps and will be transparent in terms of pump capability. Therefore, the consequences of an accident previously evaluated in the SAR will not be increased.

Question 3 Response:
The modified pumps will continue to meet the operational aspects of the original design specification and the design margin as defined by the ANO-2 Technical Specifications and SAR documents. No other aspect of system operation is affected. The subject pump internal components are not pressure boundary components. The replacement material is vendor recommended (previous material is obsolete) and has been evaluated by ANO for acceptability. ANO has concurred with the vendor assessment that the components constructed of the replacement material do not affect form, fit or function of the components. Therefore, the probability of a malfunction of equipment important to safety will not be increased.

Question 4 Response:
The modifications are restricted to the pump itself with no impact or effect on any other SSC. The form, fit or function of the balance drum and sleeve is unaffected by the change and the failure modes of a HPSI pump equipped with this component material are the same as those for a pump with the original materials. (no flow, degraded flow, leakage). Therefore the consequences of a malfunction of equipment important to safety will not be increased.

Question 5 Response:
The HPSI pumps are not assigned any role in the initiation of any accident evaluated in the SAR. They are and will continue to be utilized strictly in a reactive mode as a tool in accident mitigation. Auto-start setpoints and criteria for securing a HPSI pump also remain unchanged. The change per this evaluation will be transparent to all HPSI and ECCS system functions. Therefore, the possibility of an accident of a different type than any previously evaluated in the SAR will not be created.

Question 6 Response:
The location, orientation, hydraulic performance, NPSH requirements /availability, power requirements and system interface remain unchanged. The ability to start and operate during a seismic event or at reduced motor supply voltages is not degraded as a result of this change. The debris passing capability is not reduced. Form, fit and function are unaffected by this vendor recommended material substitution. Therefore, the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR will not be created.

Question 7 Response:
Start and run capability (including operation at reduced voltage and during seismic events), hydraulic performance (including operation at available NPSH), debris passing capability, tolerance to thermal transients, operation at vibration levels sufficiently low to ensure required run time capability, internals resistance to corrosion and limited leakage (with or without a temporary loss of cooling water) are all implicit criteria serving to establish the margin of safety provided by the HPSI pumps. System requirements for limiting runout flow and providing proper flow splits and pump requirements for providing adequate flow are specifically addressed in the applicable Tech Spec bases. In each area, either a positive impact or no impact will be caused by this change. In all aspects, both specified and implied, the margin of safety as defined in the bases for any technical specification will not be reduced by use of the new balance sleeve and drum material.

Detemination of Unreviewed Safety Question Replaced Page

Question 1 Response:

This change affects specific HPSI pump components. No accident previously evaluated in the SAR is promulgated to a failure of a HPSI pump. The HPSI pumps are normally in a standby condition and are activated in response to accident conditions. Therefore, the probability of an accident previously evaluated in the SAR will not be increased.

Question 2 Response:

The hydraulic performance of the pump is not affected in terms of discharge head and pressure, nor are net positive suction head (NPSH) requirements increased. Therefore, the consequences of an accident previously evaluated in the SAR will not be increased.

Question 3 Response:

The modified pumps will continue to meet the operational aspects of the original design specification and the design margin as defined by the ANO-2 Technical Specifications and SAR documents. No other aspect of system operation is affected. Therefore, the probability of a malfunction of equipment important to safety will not be increased.

Question 4 Response:

The modifications are restricted to the pump itself with no impact or effect on any other SSC. The failure modes of a HPSI pump equipped with this component material is the same as those for a pump with the original pump (no flow, degraded flow, leakage). Therefore the consequences of a malfunction of equipment important to safety will not be increased.

Question 5 Response:

The HPSI pumps are not presently assigned any role in the initiation of any accident evaluated in the SAR. They are and will continue to be utilized strictly in a reactive mode as a tool in accident mitigation. Auto-start setpoints and criteria for securing a HPSI pump also remain unchanged. The change per this evaluation will be transparent to all HPSI and ECCS system functions. Therefore, the possibility of an accident of a different type than any previously evaluated in the SAR will not be created.

Question 6 Response:

The location, orientation, hydraulic performance, NPSH requirements/availability, power requirements and system interface remain unchanged. The ability to start and operate during a seismic event or at reduced motor supply voltages is not degraded as a result of this change. The debris passing capability is not reduced. Therefore, the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR will not be created.

Question 7 Response:

Start and run capability (including operation at reduced voltage and during seismic events), hydraulic performance (including operation at available NPSH), debris passing capability, tolerance to thermal transients, operation at vibration levels sufficiently low to ensure required mission time capability, internals resistance to corrosion and limited leakage (with or without a temporary loss of cooling water) are all implicit criteria serving to establish the margin of safety provided by the HPSI pumps. System requirements for limiting runout flow and providing proper flow splits and pump requirements for providing adequate flow are specifically addressed in the applicable Tech Spec bases. In each area, either a positive impact or no impact will be caused by this change. In all aspects, both specified and implied, the margin of safety as defined in the bases for any technical specification will not be reduced.