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Dale E. James
Manager, Licensing
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2CAN110502

November 21, 2005

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: 10 CFR 50.59 Summary Report
Arkansas Nuclear One, Unit 2
Docket No. 50-368
License No. NPF-6

Dear Sir or Madam:

In accordance with 10 CFR 50.59(d)(2), enclosed is the Arkansas Nuclear One – Unit 2 (ANO-2) 10 CFR 50.59 summary report for the time period ending October 11, 2006. This report contains a brief description of changes in procedures, the facility as described in the ANO-2 Safety Analysis Report (SAR), changes in the ANO-2 Technical Requirements Manual (TRM), and changes in the ANO-2 Technical Specification (TS) Bases. The report also contains a description of tests and experiments conducted, if any, which were not described in the SAR, and other changes to the SAR for which a safety evaluation was conducted. A copy of each safety evaluation, both ANO-2 specific and those evaluations common between ANO-2 and ANO - Unit 1 (ANO-1), is included in the enclosure.

This report was previously submitted via CD-Rom on October 13, 2005 (2CAN100502). However, the staff requested the report to be resubmitted since the CD-Rom file text was not fully searchable. Therefore, a hard copy of the report is being submitted under this letter.

If you have any questions or require additional information, please contact David Bice at 479-858-5338.

Sincerely,

Dale E. James

DEJ/dbb

Enclosure 1: ANO-2 10 CFR 50.59 Summary Report

IE47

cc: Dr. Bruce S. Mallett
Regional Administrator
U. S. Nuclear Regulatory Commission
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611 Ryan Plaza Drive, Suite 400
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NRC Senior Resident Inspector
Arkansas Nuclear One
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U. S. Nuclear Regulatory Commission
Attn: Mr. Drew G. Holland
MS O-7D1
Washington, DC 20555-0001

ANO-2 10 CFR 50.59 Summary Report

50.59 #	Initiating Document	Summary
2003-17	ER-ANO-2000-2804-017	HPSI Pump 2P-89C Replacement
2003-29	ER-ANO-2003-0787-000	Minimum SWS Flow Required for SDC Room Cooling
2003-31	ER-ANO-2003-0793-000	Minimum Service Water Flow Required for LPSI Pump Seal Coolers
2004-14	ER-ANO-2003-0793-001	SDC Pump Seal Cooler SW Flow Evaluation
2004-15	TRM Revision 17	Relocate Presssurizer Heatup/Cooldown Limits TS/Bases to TRM
2004-16	ER-ANO-2000-3275-003	Temp-Alt to Maintain HPSI Header Pressurization
2004-20	ER-ANO-2004-0172-000	Clarification of Scale and Pointer System Associated with the ANO-2 SFP and Cask Loading Pit
2004-22	ER-ANO-2000-2768-002	Circuit Isolation for EDG Room Exhaust Fans
2004-23	ER-ANO-2004-0786-000	Clarification of SFP Transfer Tube Outside Valve Containment Isolation Function
2004-24	ER-ANO-2002-0875-004	Removal of SDC Automatic Closure Interlock
2004-26	ER-ANO-2002-0393-000	Removal of CAMS High/Low Air Flow Trip Function
2004-27	ER-ANO-2004-0933-000	Temporary Alteration to Maintain Quench Tank Penetration Isolation Valve in the Closed Position
2004-28	ER-ANO-2004-0618-000	Temporary Alteration to Install/Remove SFP Reverse Osmosis Cleaning System
2004-30	ER-ANO-2003-0012-029	Evaluation of Postulated Unit 2 Boron Dilution Event
2005-02	ER-ANO-2004-0098-002	Temp-Alt to Install Temporary ECP Water Barrier
2005-04	ER-ANO-2002-1078-009	SG Replacement Heavy Load Evaluation
2005-06	A2-NE-2004-000	Unit 2 Cycle 18 Reload Report
2005-07	A2-NE-2004-001	Unit 2 Cycle 18 Core Operating Limits Report (COLR)
2005-08	ER-ANO-2003-0245-017	Reactor Vessel Head Shroud Modification
2005-12	A2-NE-2005-003	Criteria for Failed Incore Instrument During Startup
2005-13	A2-NE-2005-003	Additional Information Regarding Failed Unit 2 ICI During Startup
2005-19	ER-ANO-2005-0316-000	Temporary Alteration to Supply Dummy CEA #20 Position Signal to CEAC #1
2005-21	ER-ANO-2002-1078-010	Replacement SG Rigging Outside Reactor Building
2005-24	OP-2409.763	Verification of Fuel Pins Located Inside Guide Tube Assemblies

ANO 50.59 Evaluation Number

2003-017

I. OVERVIEW / SIGNATURES

Facility: ANO - Unit 2

Document Reviewed: ER-ANO-2000-2804-017 including linked ERs 2000-2804-022, -023, -024 & -025 and Work Plan 2409.752. **Change/Rev.:** ~~new~~ 0

System Designator(s)/Description: HPSI ER7 9-4-03 9/4/03 ER7 9-2-03 9/4/03

Description of Proposed Change

See Continuation Page

If the proposed activity, in its entirety, involves any one of the criteria below, check the appropriate box, provide a justification/basis in the Description above, and forward to a Reviewer. No further 50.59 Review is required. If none of the criteria is applicable, continue with the 50.59 Review.

☐ The proposed activity is editorial/typographical as defined in Section 5.2.2.1.

☐ The proposed activity represents an "FSAR-only" change as allowed in Section 5.2.2.2_____. (Insert item # from Section 5.2.2.2).

If further 50.59 Review is required, check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	**SCREENING**	**Sections I, II, III, and IV required**
☐	**50.59 EVALUATION EXEMPTION**	**Sections I, II, III, IV, and V required**
☒	**50.59 EVALUATION (#:** EEN # 03-017	**Sections I, II, III, IV, and VI required**

Preparer: Edward R. France/ Edward R France /EOI/DE/ 9-2-03
Name (print) / Signature / Company / Department / Date

Reviewer: Stephen J. Lynn/ Stephen J Lynn /EOI/DE/ 9-2-03 Bryan Daiber 9/4/
Name (print) / Signature / Company / Department / Date

OSRC Charlie Zimmerman / Kirk Linder for Charlie Zimmerman per telecon 9/4/03
Chairman's Signature / Date
[Required only for Programmatic Exclusion Screenings (see Section 5.9) and 50.59 Evaluations.]

List of Assisting/Contributing Personnel:

Name: Stan Haynes, John Hotz, Susan Mitchell, John Richardson

Scope of Assistance: Entire 50.59

Description of Proposed Change
This 50.59 supports the modification upgrades to the High Pressure Safety Injection (HPSI) 2P-89C pump bearing housing, installation of a precision pump element with back filed impeller, and a Schnoor spring kit per ER-ANO-2000-2804-17 and Work Plan OP-2409.752. The Safety Analysis calculations were revised to incorporate maximum HPSI flow of 900 gpm and pump horsepower requirements of 530 HP. The supporting calculations and this 50.59 will support operation of all three HPSI pumps with the same modification applied.

The bearing housing change is for the purpose of eliminating bearing overheating due to the cold water crush concern due to unregulated service water temperatures and the concern for bearing outer race slippage due to improperly sized bearing support areas. The new precision pump element and Schnoor spring kit will mitigate the accelerated wear and elevated vibration levels.

The bearing housings replacement, the pump element replacement and the new Schnorr spring kit for the 2P89C HPSI pump has been evaluated and justified per this ER-ANO-2000-2804-017 with linked ERs 2000-2804-022, -023, -024, and -025. The new components are for the purpose of mitigating bearing overheating, pump vibration and accelerated wear. During 2R14 the 2P-89A and 2P-89B pumps were modified by ER002804N201. The 'A' pump had a new Schnoor kit installed and the 'B' pump had a new Schnoor kit and new precision pump element installed.

Based on the evaluations of this NCP, past evaluations, past operating experience and vendor input, these changes will enhance the performance and reliability of the HPSI pumps and HPSI system.

The Post Modification Test of Work Plan OP-2409.752 measures pump and motor performance and is allowed by existing procedure 2104.039.

ERs 2000-2804-022, -023, -024 & 025 evaluated the issues affected by the increase in HPSI pump flow and HPSI pump motor horsepower. Included were EDG loading, EQ, HPSI pump room heat load, containment pressure, ECP temperature, LTOP performance, cladding temperature, SGTR (steam generator tube rupture) issues.

As a result of the calculation revisions and pump configuration change the following SAR items require revision:

<u>ANO-2 SAR Section 15.1.18.4.3.2</u>
This SAR section describes the results of the Steam Generator Tube Rupture (SGTR) event which currently states that <121,000 lbs. of reactor coolant is transported to the main steam system. The SGTR event was evaluated for the increased HPSI flow per Calculation 97-E-0204-05 which resulted in an increase in the reactor coolant being transported to the main steam system. Therefore, Section 15.1.18.4.3.2 is being revised to state "<122,500 lbs. of reactor coolant is transported to the main steam system."

<u>ANO-2 SAR Table 6.3-9</u>
The table presents the results of DRN 03-1182 to Calculation 91-E-0007-06. The revision to this calculation maintained the total Low Pressure Safety Injection (LPSI) and HPSI flow such that the results of the Emergency Core Cooling System (ECCS) performance evaluation remain unchanged.

<u>ANO-2 SAR Table 8.3-1</u>
DRN-03-1242 to 89-E-0144-01 addressed the increased Emergency Diesel Generator requirements for the HPSI pump modifications.

<u>ANO-2 SAR Table 7.5-3</u>
DRN 03-824 for drawing M-2538 shows a new output range of 0-1000 gpm per ER-ANO-2000-2804-024 to account for the 900 gpm max flow.

<u>ANO-2 SAR Table 6.3-1</u>
ER-ANO-2002-0528-005 changed calculation 91-E-0116-01, rev 5 for a maximum pump flow of 900 gpm.

ANO-2 Figure 6.3-4
Due to conflicting pump curve data this curve will be changed at a time when all 3 pumps have been upgraded.

ANO-2 SAR Figure 9.2-22
DRN-03-1372 which changed drawing M-2250 applies to this Figure as well.

ANO-2 SAR Section 6.3.2.7
The pump power requirements are not given in Table 6.3-1. Therefore, delete the sentence stating "pump power requirements are given in Table 6.3-1".

II. SCREENING

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113 (Reference 2.2.13). (See Section 5.1.13 for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # and/or SECTIONS IMPACTED
FSAR	☒	☐	Table 6.3-9, Table 7.5-3, Table 6.3-1, *Figure 9.2-22, Table 8.3-1, Section 15.1.18.4.3.2, Section 6.3.2.7, Figure 6.3-4*
TBases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Reports[1]	☐	☒	
If "YES", perform an Exemption Review per Section V OR perform a 50.59 Evaluation per Section VI AND initiate an LBD change in accordance with NMM LI-113 (Reference 2.2.13).			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2]	☐	☒	
Fire Protection Program [3] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculation Manual[3]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM LI-113 (Reference 2.2.13).			

2. Does the proposed activity involve a test or experiment not described in the FSAR? ☐ Yes ☒ No
If "yes," perform an Exemption Review per Section V OR perform a 50.59 Evaluation per Section VI.

3. Does the proposed activity potentially impact equipment, procedures, or facilities utilized for storing spent fuel at an Independent Spent Fuel Storage Installation? ☐ Yes ☒ No ☐ N/A
(Check "N/A" if dry fuel storage is not applicable to the facility.)
If "yes," perform a 72.48 Review in accordance with NMM Procedure LI-112.
(See Sections 1.5 and 5.3.1.5 of the EOI 10CFR50.59 Review Program Guidelines.)

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[1] If "YES," see Section 5.1.4. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Evaluation.
[3] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition.

B. Basis

Provide a clear, concise basis for the answers given in the applicable sections above. Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis. See EOI 50.59 Guidelines Section 5.6.6 for guidance.)

See Continuation Sheet

C. References

Discuss the methodology for performing the LBD search. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.3.6.4 of LI-101. **NOTE: Ensure that electronic and manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
50.59 unit 2	LRS: All (keywords of HPSI w/10 pump, bearing w/10 housing, "high pressure safety injection", 2P-89A, 2P89A, 2P-89B, 2P89B, 2P89C, 2P-89C, "thrust bearing", bearing w/10 cooling) *"Steam Generator Tube Rupture", SGTR, "121,000", HPSI w/20 max, HPSI w/20 maximum, HPSI w/20 hp, HPSI w/20 horsepower, HPSI w/20 EDG, HPSI w/20 470, HPSI w/20 600, HPSI w/20 Emergency, HPSI w/20 flow, ECCS, Emergency Core Cooling System, Emergency Cooling Pond, ECP, Emergency Diesel Generator, EDG, LTOP, Low Temperature Overpressure Protection, recirculation, recirculation actuation signal, RAS, transfer w/25 sump, transfer w/25 RWT, minimum time, containment sump*

LBDs/Documents reviewed manually:

Unit 2 *SAR Section 15.1.18, SAR Chapter 6, SER 244, TS 3/4.4.12, 3/4.5.2, 3/4.5.3, 3/4.8.1 and associated TS bases , SAR Chapter 6 Tables and Figures*

D. **Is the validity of this Review dependent on any other change?** (See Section 5.3.4 of the EOI 10CFR50.59 Program Review Guidelines)

If "Yes," list the required changes.

B. Basis: (continuation)

Operating License Documents: The operating license does not describe pump construction. The effect of the change will be elimination of the possibility of cold water crush on the HPSI pump bearings, restoration of the design bearing to bearing housing clearance, lower vibration levels and provide for more consistent hydraulic performance. The result will in turn be longer time spans between corrective maintenance activities and the ability of the pump to more reliably meet all design basis requirements with cooling water un-isolated to the bearings. No change to the operating license is required.

The operating license documents consider the requirements for HPSI flow and also the Emergency Diesel Generator (EDG) loading. For HPSI flow the Technical Specifications and Bases are concerned with meeting minimum flow requirements and also flow distribution requirements (TS 3/4.5.2, 3/4.5.3 and associated bases section). The bases section indicate that the surveillance procedures will ensure that system flow will remain within the analyzed range. The SGTR analysis with increased HPSI flow resulted in an increase in the primary to secondary leakage through the ruptured tube. The Operating License, including Technical Specifications and NRC Orders do not discuss the SGTR event or any of the results from the event. While TS Basis 3/4.4.6.2, "Reactor Coolant System Leakage", and 3/4.4.8, "Specific Activity" mentions a SGTR, it only discusses the dose consequences of the tube rupture and not the level of detail that includes the amount of leakage from the ruptured tube.

The EDG load has been evaluated against the increased horsepower requirements of HPSI pump motors. The pertinent calculations have been revised to show that the diesel has adequate margin to handle the increased horsepower requirements of the HPSI pump. Review of the operating license documents indicates that the EDG loading is not discussed regarding the capability of the machine. TS 3/4.8.1 provides surveillance requirements for demonstrating EDG operability. This TS defines the allowed startup times, the ability to output a given load (less than the maximum capability), and the ability to handle the loss of the largest major load. This proposed modification will not change these requirements or invalidate the ability of the EDG to handle the design basis loads.

LTOP requirements are unchanged as described in the operating license documents. The modification is shown to be within the design basis of the system. Therefore, there is no impact to the Operating License Documents from the proposed modification to the HPSI system.

LBDs Controlled Under 50.59: The SAR documents were reviewed and information was discovered such that the proposed changes will cause a SAR statement to be untrue or inaccurate. SAR Sections 6.3.2.7 will be revised per the attached LBDC forms to correct an existing error in the statement. Table 6.3-9 will have a new max HPSI flow value of 1760 gpm. Table 7.5-3 will be revised to change the instrumentation flow range requirement. Figure 6.3-4 will be revised to show that the curve will be updated at a later date. Table 6.3-1 will be revised to change the maximum HPSI flow. Figure 9.2-22 will be revised for heat load by DRN 03-1372 due to the increase in motor horsepower.

The SAR discusses the requirements for the SGTR analysis, HPSI flow requirements, Containment Analyses, Dose Consequences, Emergency Core Cooling Systems (ECCS) performance analyses, LTOP analyses, and EDG loading requirements that were impacted by the proposed modification. Review and revision of the indicated documents in section I will require revision SAR Tables 6.3-9 and 8.3-1, and SAR section 15.1.18.4.3.2.

LBDs Controlled Under Other Regulations: The amount of primary to secondary system leakage being changed in the SAR, HPSI and LPSI flow rates, and EDG loading are a result of a modification to the HPSI pump. The modification does not alter the design function of the HPSI pump or its ability to meet designed requirements and does not involve or constitute a test or experiment. Nor does the HPSI pump modification affect the Independent Spent Fuel Storage Facility since the change only affects the performance of ECCS equipment.

The Work Plan is consistent with previous HPSI full flow test plans and is not a new test performed at ANO. The test is performed under normal surveillance procedures as identified in the SAR.

III. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.
Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in an air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

IV. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

A. Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

The Security Department answers the following questions if one of the questions was answered "yes".

B. Is the Security Plan actually impacted by the proposed activity? ☐ Yes ☐ No

C. Is a change to the Security Plan required? ☐ Yes Change # (optional) ☐ No

Name of Security Plan reviewer (print) / Signature / Date

V. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A, above.

A. Check the applicable boxes below. If any of the boxes are checked, a 50.59 Evaluation is not required. If none of the boxes are checked, perform a 50.59 Evaluation in accordance with Section VI. Provide supporting documentation or references as appropriate.

☐ The proposed activity meets all of the following criteria regarding design function per Section 5.6.1.1:

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of evaluation that demonstrates intended design function(s) of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed activity already exists per Section 5.6.1.2. Reference 50.59 Evaluation #_____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

☐ The NRC has approved the proposed activity or portions thereof per Section 5.6.1.3. Reference: _____

☐ The proposed activity is controlled by another regulation per Section 5.6.1.4.

B. Basis

Provide a clear, concise basis for determining the proposed activity may be exempted such that a third-party reviewer can reach the same conclusions. See Section 5.6.6 of the EOI 10CFR50.59 Review Program Guidelines for guidance.

VI. 50.59 EVALUATION

A. Executive Summary (Serves as input to NRC summary report. Limit to one page or less. Send an electronic copy to the site licensing department after OSRC approval, if available.)

Brief description of change, test, or experiment:

Per LI-101, this section is not applicable to ANO and therefore, does not require completion.

Reason for proposed Change:

Per LI-101, this section is not applicable to ANO and therefore, does not require completion.

50.59 Evaluation summary and conclusions

Per LI-101, this section is not applicable to ANO and therefore, does not require completion.

B. License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below.

☐ Yes
☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

This nuclear change modifies specific HPSI pump components. The modifications will enhance operation in terms of lower vibration levels and greater longevity and will be transparent to the remainder of the HPSI system. No accident previously evaluated in the SAR is initiated by 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 frequency of occurrence of an accident previously evaluated in the SAR will not be increased.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

The modification increases the ability of the HPSI system to meet its design function by increasing the Head/Flow characteristics, updating the bearing system to a more reliable and robust arrangement, providing a more vibration resistance internal pump configuration and eliminating the possibility of cold water crush of the bearings. No changes are made which will present any unanalyzed challenge to any interfacing systems.

The modified pump (2P-89C) per ER 2000-2804-017 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. The modifications implemented by this nuclear change address the original design philosophy, now known to be imperfect, of optimizing the various piece-parts and their working relationship for a particular operating regime, which in this instance is rarely realized. As opposed to steady state operation near the BEP (best efficiency point), frequent starts and stops with interim operation at flow conditions far below or well above the BEP is typical. The material changes reflect a progression to materials better suited for the transient and off BEP service these pumps are subjected to, particularly in the areas of strength, hardness, and wear resistance, while maintaining the corrosion resistance required for the application. Individually and collectively, the modifications will enhance pump longevity, with a corresponding positive effect on availability and reliability. The horsepower requirements of 2P-89C will increase consistent with that of 2P-89B. The Emergency Diesel (EDG) Load will not exceed the EDG capacity and will not increase its likelihood of failure. Therefore, the likelihood of occurrence of a malfunction of equipment important to safety will not be increased.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The modifications implemented by this nuclear change are in response to less than satisfactory HPSI pump performance in terms of the frequency and scope of required corrective maintenance activities. The changes are directed at lowering pump vibration levels via material changes and design / assembly features and methods to improve rotor stability (radial and axial) and wear resistance. The hydraulic performance of the pump is affected in terms of discharge head, flow, and pressure, but does not affect net positive suction head (NPSH) requirements. These changes will have the effect of improving the availability and reliability of the HPSI pumps, thus reducing the potential for pump failure or degradation to become a factor in accident mitigation.

The proposed HPSI modification has been evaluated as for the impact to the ECCS Performance analysis, Containment Analysis, EDG loading, LTOP, and non-LOCA transients. No changes to the analysis results described in the SAR other than the SGTR have been identified. The impact of the proposed modification to the SGTR event results in an increase in the primary mass that is transferred to the main steam system through the ruptured tube. SAR Section 15.1.18.4.3.2 reflects the change from 121,000 lbs to 122,500 lbs (rounded up from 122,400). However, due to the differences in the flashing fractions, the amount of reactor coolant that immediately flashes to steam and escapes through the main steam safety valves is decreased from 6865.2 lbs to 6778.6 lbs. The reactor coolant that flashes to steam carries radioiodine directly from the reactor coolant to the atmosphere through the safety valves. This steam release is one contributor to the offsite and control room dose. Other contributors to dose include the portion of the secondary side inventory that is released through the safety valves during the cool down phase from both steam generators. The affected Steam Generator is isolated in 60 minutes and the unaffected Steam Generator is then used for cool down. The Technical Specification limit for secondary coolant specific activity is 10% of the primary coolant specific activity. Also, any release from the secondary side inventory is further reduced by the decontamination factor of 100. Therefore, the reactor coolant that flashes to steam and escapes directly through the MSSV is by far the main contributor to the offsite and control room dose. Since there was a decrease in this steam release, the current analysis of record, Appendix E of Calculation 98-E-0036-04, remains bounding, and there is no increase in the resultant doses from a SGTR. Therefore, the increase in the HPSI flow does not result in an increase in the consequences of the SGTR event.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

This modification does not change the interdependence of the affected component (2P89C) with any other component. The change does not make the pump more likely to leak than before nor will it make the pump less able to perform in the case of a single failure of any other component.

The modifications are restricted to the pump itself with no adverse effect on any other SSC. There is a change in hydraulic performance and in power consumption. The failure modes of a HPSI pump modified per this nuclear change are the same as those for an unmodified pump (no flow, degraded flow, leakage).

The proposed modification to the HPSI system was evaluated against the safety analysis presented in the SAR. The Containment, ECCS performance, EDG loading requirements, and the Low Temperature Over Pressure (LTOP) analyses were all found to be bounded by the current analysis of record (AOR). For the SGTR analysis the increase in the primary coolant transferred to the main steam system through the ruptured tube is the result of a malfunction of a component (SG tube). As stated in Question 3, there was a decrease in the reactor coolant that flashes to steam and released through the safety valves, therefore, there was no increase in dose due to the ruptured steam generator tube.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The HPSI pumps are not the initiator of any accident evaluated in the SAR. They are used only for accident mitigation. Auto-start set points and criteria for securing a HPSI pump also remain unchanged. Therefore, the possibility of an accident of a different type than any previously evaluated in the SAR will not be created.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS

The location, orientation, NPSH requirements / availability, 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 because the only change in an internal clearance of interest is an increase in impeller to diffuser vane gap. The material substitutions result in an improvement in the pumps ability to respond without progressive damage to the cyclic off BEP operation they typically are subjected to. Therefore, the possibility of a malfunction of equipment important to safety with a different result than any previously evaluated in the SAR will not be created.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

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.

ECCS performance analyses remain bounding due to conservatisms in the current AOR for maximum HPSI and LPSI flows. The current containment analysis also remains bounded by the AOR based again on the conservatisms in the combined HPSI and LPSI flows. The SGTR analyzes the breach of a fission product barrier (steam generator tube). The evaluation of increased HPSI flow shows that the analysis of record remains bounding, thus fuel safety limits are not challenged and since the SGTR event results in a release of steam directly to the atmosphere, there is no impact to the containment. LTOP evaluations show that the increased HPSI flow is within the current AOR so that the RCS will not be challenged beyond the current limts. Therefore, the design basis limit for the fuel and containment is not altered or exceeded as a result of the increased HPSI performance.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

The method used for evaluating the safety analyses remains unchanged. The evaluations performed include the SGTR analysis, the Containment Analysis, EDG loading evaluation, Dose Analysis, ECCS Performance analysis. Each of these evaluations was performed to assess the impact of increased HPSI flow and increased pump horsepower requirements. In each case the methodology employed was identical to the AOR. Therefore, no methodology change was made.

No method of evaluation is affected by the material and component upgrade incorporated by this modification. The HPSI pumps still provide the ECCS safety functions with the same or better expected performance. The bearing housing, pump element and bearing spring kit are determined to mitigate the elevated bearing temperature, the pump vibration and accelerated wear phenomena.

ANO 50.59 Evaluation Number

2003-029

I. OVERVIEW / SIGNATURES

Facility: ANO - Unit 2

Document Reviewed: ER-ANO-2003-0787-000 **Change/Rev.:** 0

System Designator(s)/Description: Service Water, Auxiliary Building HVAC

Description of Proposed Change

ER-ANO-2003-0787-000 evaluates the minimum required Service Water flow for Operability of the equipment cooled by the Shutdown Cooler room coolers, 2VUC-1A, 1B and 1C. The ER calculates the flow required to provide a room temperature at 143 degrees F. Maximum room temperature for Operability of the equipment is 143.6 degrees F. Drawing M-2250 (2FSAR 9.2-22) "Schedule of Water Demand for Aux. Cooling and Service Water System" states the minimum qualified flow is 40 gpm. The 40 gpm value was derived in CALC-94-E-0095-20, Rev 0 based on a room temperature of 141 degree F. . DRN-03-1872 will change the required flow from 40 gpm to 29 gpm on M-2250. A note is also added that ER-2003-0787-000 provides an operability evaluation for Shutdown Cooler room coolers 2VUC-1A, 1B and 1C. The minimum flow for operability is 29 gpm per cooler. Any 2 of 3 coolers meet room heat loads for DBA conditions. However, design flow rates are not changed.

If the proposed activity, in its entirety, involves any one of the criteria below, check the appropriate box, provide a justification/basis in the Description above, and forward to a Reviewer. No further 50.59 Review is required. If none of the criteria is applicable, continue with the 50.59 Review.

☐ The proposed activity is editorial/typographical as defined in Section 5.2.2.1.

☐ The proposed activity represents an "FSAR-only" change as allowed in Section 5.2.2.2_____. (Insert item # from Section 5.2.2.2).

If further 50.59 Review is required, check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	SCREENING	Sections I, II, III, and IV required
☐	50.59 EVALUATION EXEMPTION	Sections I, II, III, IV, and V required
☒	50.59 EVALUATION (#: EFN # 03-029	Sections I, II, III, IV, and VI required

Preparer: Steve Bonner / [signature] / EOI / SYS / 10/9/03
Name (print) / Signature / Company / Department / Date

Reviewer: Keith Perkins / [signature] / EOI / SYS / 10-9-03
Name (print) / Signature / Company / Department / Date

OSRC Charlie Zimmerman / [signature] 10/9/03
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings (see Section 5.9) and 50.59 Evaluations.]

List of Assisting/Contributing Personnel:

Name:	Scope of Assistance:
Roger Wilson	Wrote initial 50.59 Exemption

II. SCREENING

A. Licensing Basis Document Review

1. **Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?**

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113 (Reference 2.2.13). (See Section 5.1.13 for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # and/or SECTIONS IMPACTED
FSAR	☒	☐	Unit 2 SAR Figure 9.2-22
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Reports[1]	☐	☒	
If "YES", perform an Exemption Review per Section V OR perform a 50.59 Evaluation per Section VI AND initiate an LBD change in accordance with NMM LI-113 (Reference 2.2.13).			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☐	
Emergency Plan[2]	☐	☐	
Fire Protection Program[3] (includes the Fire Hazards Analysis)	☐	☐	
Offsite Dose Calculation Manual[3]	☐	☐	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM LI-113 (Reference 2.2.13).			

2. **Does the proposed activity involve a test or experiment not described in the FSAR?** ☐ Yes ☒ No
   If "yes," perform an Exemption Review per Section V OR perform a 50.59 Evaluation per Section VI.

3. **Does the proposed activity potentially impact equipment, procedures, or facilities utilized for storing spent fuel at an Independent Spent Fuel Storage Installation?** ☐ Yes ☒ No ☐ N/A
   (Check "N/A" if dry fuel storage is not applicable to the facility.)
   If "yes," perform a 72.48 Review in accordance with NMM Procedure LI-112.
   (See Sections 1.5 and 5.3.1.5 of the EOI 10CFR50.59 Review Program Guidelines.)

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[1] If "YES," see Section 5.1.4. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Evaluation.
[3] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition.

B. Basis

Provide a clear, concise basis for the answers given in the applicable sections above. Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis. See EOI 50.59 Guidelines Section 5.6.6 for guidance.)

ER-ANO-2003-0787-000 is an operability evaluation for Shutdown Cooler room coolers 2VUC-1A, 1B and 1C. The ER issued DRN-03-1864 to Calc-94-E-0095-20. The DRN provides a minimum flow rate for the room coolers of 29 gpm per cooler to assure a maximum room temperture of 143 degrees F. Any 2 of 3 coolers provide the cooling required to meet the DBA heat loads for Shutdown Cooling room 2013/2014 (Vault A). New note 18 to this effect is added to drawing M-2250, sheet 1, rev. 18. The drawing is 2FSAR Figure 9.2-22. The note states that design flow rates for the coolers are not changed by the operability evaluation. As stated above, ER-ANO-2003-0787-000 provides an operability evaluation for minimum flows to the Shutdown Coolers room coolers. No other FSAR impacts were identified. Details concerning the required service water flow for room cooling are below the level of detail typically contained in other LBD's or the Operating License, Tech Specs or any other LBD. The evaluation proposes no new test or experiment. The evaluation will be used in conjunction with standard as-left service water system flow testing at the end of 2R16.

C. References

Discuss the methodology for performing the LBD search. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.3.6.4 of LI-101. **NOTE: Ensure that electronic and manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
LRS Search U2 50.59	"2VUC-1A" or "2VUC-1B" or "2VUC-1C"; . (shutdown w/20 room Unit cooler)

LBDs/Documents reviewed manually:

Figure 9.2-22, 2FSAR Section 9 Table 9.2-5, "Service Water System Single Failure Analysis", 2FSAR 9.2.1.2.2.5, [SW] Valves and Sluice Gates

D. Is the validity of this Review dependent on any other change? (See Section 5.3.4 of the EOI 10CFR50.59 Program Review Guidelines)

☐ Yes
☒ No

If "Yes," list the required changes.

N/A

III. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in an air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

IV. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

A. Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

The Security Department answers the following questions if one of the questions was answered "yes".

B. Is the Security Plan actually impacted by the proposed activity? ☐ Yes ☐ No

C. Is a change to the Security Plan required? ☐ Yes Change # (optional) ☐ No

Name of Security Plan reviewer (print) / Signature / Date

V. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A, above.

A. Check the applicable boxes below. If any of the boxes are checked, a 50.59 Evaluation is not required. If none of the boxes are checked, perform a 50.59 Evaluation in accordance with Section VI. Provide supporting documentation or references as appropriate.

☐ The proposed activity meets all of the following criteria regarding design function per Section 5.6.1.1:

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of evaluation that demonstrates intended design function(s) of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed activity already exists per Section 5.6.1.2. Reference 50.59 Evaluation # _____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

☐ The NRC has approved the proposed activity or portions thereof per Section 5.6.1.3. Reference: _____

☐ The proposed activity is controlled by another regulation per Section 5.6.1.4.

B. Basis

Provide a clear, concise basis for determining the proposed activity may be exempted such that a third-party reviewer can reach the same conclusions. See Section 5.6.6 of the EOI 10CFR50.59 Review Program Guidelines for guidance.

VI. 50.59 EVALUATION

A. Executive Summary (Serves as input to NRC summary report. Limit to one page or less. Send an electronic copy to the site licensing department after OSRC approval, if available.)

Brief description of change, test, or experiment:

ER-ANO-2003-0787-000 is an operability evaluation for Shutdown Cooler room coolers 2VUC-1A, 1B and 1C. The ER issued DRN-03-1864 to Calc-94-E-0095-20. The DRN provides a minimum flow rate for the room coolers of 29 gpm per cooler. Any 2 of 3 coolers provide the cooling required to meet the DBA heat loads for Shutdown Cooling room 2013/2014 (Vault A). New note 18 to this effect is added to drawing M-2250, sheet 1, rev. 18. The drawing is 2FSAR Figure 9.2-22. The note states that design flow rates for the coolers are not changed by the operability evaluation. The revision to Calc-94-0095-20 calculates the flow required to assure a maximum room temperature of 143 degrees F. The maximum room temperature for equipment Operability is 143.6 degrees F. The design flow listed on M-2250 Sheet 1 Rev 18 is 40 gpm, which would assure a maximum room temperature of 141 degrees F.

Reason for proposed Change:

The evaluation will be used in conjunction with standard as-left service water system flow testing at the end of 2R16.

50.59 Evaluation summary and conclusions

The lower flow will not pose an Unreviewed Safety Question. The flow will be adequate to assure the Shutdown Cooler room temperature will not exceed the limits of the equipment in the room.

B. License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below.

☐ Yes
☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

To increase the frequency of occurrence of an accident any evaluated change would have to affect a Chapter 15 accident initiator. The Shutdown Cooler room coolers are not considered accident initiators. The lower service water flow rate and the slightly increased maximum room temperature will not affect the ability of the safety related equipment in the room from performing its function.
The AIRCOOL analysis performed in this ER shows that adequate room cooling is still available with 29 gpm of SW flow to 2VUC-1A, 1B and 1C once service water temperature has reached its maximum temperature of 121 degrees F. The higher room temperature that can be reached due to the lower cooling water flow is the result of accident conditions and not an initiator of an accident.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

Although the design flow remains 40 gpm on M-2250, the intent of the design is to provide sufficient flow to the room coolers such that sufficient heat will be rejected to the service water system to maintain room equipment Operability. The ER establishes that 29 gpm is adequate to maintain room temperature below the equipment Operability limit of 143.6 degrees F. The increase in the maximum room temperature of 141 degrees F to 143 degrees F due to the lower flow will not result in the malfunction of the safety related equipment in the room. The two degree change is a minimal increase and will still be below the equipment Operability limit.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

The change in service water flow and the resultant increase in maximum room temperature will not exceed any Operability limit of the safety related equipment in the room. Any accident mitigators are therefore unaffected by the increased room temperature and therefore the dose (consequences) on any accident evaluated are unaffected by the reduced SW flow.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

Chapter 15 accident analysis assumes that a single failure to a safety train occurs during the response to an accident. The lower SW flow does not change how this failure might be manifested. Should a single failure occur, the results of a failure are not chan ged. No additional requirements are being imposed on the safety related equipment in the room. As a result, the consequences of this assumed single failure are not impacted by the lower SW water flow.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The lower service water flow does not result in the loss of any of the safety related equipment in the room in any evaluated accident scenario. Other accidents that are different than previously evaluated are not created since no new equipment is being added and no existing equipment is being required to function any differently than it has in the past.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS

The ER evaluates the minimum service water flow at the highest expected service water temperature to maintain the safety related equipment in the room Operable. The design of the room coolers have not changed and they will still provide adequate heat rejection so that the safety related equipment in the room can perform their functions. The slight increase in SW discharge temperature is still bounded by the design temperature of the piping and is of no consequence. Failure of the safety related equipment in the room is postulated in the SAR failure modes analysis; however, no different equipment malfunctions are postulated because of the evaluated change. .

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

Fission product barriers are specifically identified as fuel cladding, reactor coolant system boundary, and containment. Since the evaluation doesn't adversely impact reactor power, core design, RCS pressure boundary material or containment design pressure the design basis for a fission product barrier is not impacted.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

A lower service water flow requirement does not constitute a method of evaluation as defined in the SAR. The evaluation used established methods for determining flow requirements.. All of the original evaluation methods and requirements are still met.

ANO 50.59 Evaluation Number

2003-031

I. OVERVIEW / SIGNATURES

Facility: ANO - Unit 2

Document Reviewed: ER-ANO-2003-793-000 **Change/Rev.:** 0

System Designator(s)/Description: LPSI/SDC

Description of Proposed Change

ER-ANO-2003-0793-000 evaluates the degraded condition of the Service Water System's ability to provide original design flow of 8 gpm to the LPSI pump seal coolers, 2E-52A and 2E-52B. The 8 gpm value is located on existing SAR Figure 9.2-22. The ER evaluated the minimum flow is actually 2.5 gpm. The ER evaluation utilized two independent methods to arrive at the same 2.5 gpm value. The first method used the vendor's tech manual (TM I075.0200) curves to determine necessary flow. The second method utilized Flowserve's computer program to determine necessary flow. Both methods considered heat transfer requirements and fouling effects. Based on the results of the ER the new flow requirement is to be changed to 2.5 gpm.

The 8 gpm requirement was based on a memo from CE sent June 22, 1981. The memo did not provide calculations or justification for the required flow.

If the proposed activity, in its entirety, involves any one of the criteria below, check the appropriate box, provide a justification/basis in the Description above, and forward to a Reviewer. No further 50.59 Review is required. If none of the criteria is applicable, continue with the 50.59 Review.

☐ The proposed activity is editorial/typographical as defined in Section 5.2.2.1.

☐ The proposed activity represents an "FSAR-only" change as allowed in Section 5.2.2.2_____. (Insert item # from Section 5.2.2.2).

If further 50.59 Review is required, check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	SCREENING	Sections I, II, III, and IV required
☐	50.59 EVALUATION EXEMPTION	Sections I, II, III, IV, and V required
☒	50.59 EVALUATION (#03-031	Sections I, II, III, IV, and VI required

Preparer: Keith Perkins/ [signature] /Entergy/Systems Engineering/ 10-9-03
Name (print) / Signature / Company / Department / Date

Reviewer: Steve Bonner [signature] / EOI / SYS / 10/9/03
Name (print) / Signature / Company / Department / Date

OSRC Charles Zimmerman [signature] 10/9/03
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings (see Section 5.9) and 50.59 Evaluations.]

List of Assisting/Contributing Personnel:

Name:
Roger Owings

Scope of Assistance:
LBD Search

II. SCREENING

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113 (Reference 2.2.13). (See Section 5.1.13 for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # and/or SECTIONS IMPACTED
FSAR	☒	☐	ANO-2 SAR Figure 9.2-22
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Reports[1]	☐	☒	
If "YES", perform an Exemption Review per Section V OR perform a 50.59 Evaluation per Section VI AND initiate an LBD change in accordance with NMM LI-113 (Reference 2.2.13).			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2]	☐	☒	
Fire Protection Program[3] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculation Manual[3]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM LI-113 (Reference 2.2.13).			

2. Does the proposed activity involve a test or experiment not described in the FSAR?
If "yes," perform an Exemption Review per Section V OR perform a 50.59 Evaluation per Section VI.

☐ Yes
☒ No

3. Does the proposed activity potentially impact equipment, procedures, or facilities utilized for storing spent fuel at an Independent Spent Fuel Storage Installation?

☐ Yes
☒ No
☐ N/A

[1] If "YES," see Section 5.1.4. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Evaluation.
[3] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition.

(Check "N/A" if dry fuel storage is not applicable to the facility.)
If "yes," perform a 72.48 Review in accordance with NMM Procedure LI-112.
(See Sections 1.5 and 5.3.1.5 of the EOI 10CFR50.59 Review Program Guidelines.)

B. Basis

Provide a clear, concise basis for the answers given in the applicable sections above. Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis. See EOI 50.59 Guidelines Section 5.6.6 for guidance.)

This 50.59 evaluation is for the ER documentation to change the service water flow requirements of the LPSI seal cooler from 8 gpm to 2.5 gpm.

Operating License Documents: Neither the Operating License nor Tech Specs describe the LPSI seal cooler to the detail of service water heat exchanger flow rate through the LPSI seal coolers.

LBDs Controlled Under 50.59: The SAR documents were reviewed and information was found such that the proposed change will cause a SAR statement to not be true. Figure 9.2-22 will show the required flow to be 2.5 gpm which will replace the 8 gpm value listed on the figure. The SAR does not provide the level of detail documenting the bases for the 8 gpm value.

LBDs Controlled Under Other Regulations: This change does not create a new configuration, new mode of operation or add equipment that creates a new function. The new configuration is physically the same only the flow rate requirements are changing. The change does not alter the design function of the LPSI seal cooler system or its ability to meet designed requirements and does not involve or constitute a test or experiment. Nor does the change affect the Independent Fuel Storage Facility since the change only affects the documented performance requirement of the LPSI pump seal cooler. There are no other LBDs or regulations that list details specific enough to require change.

C. References

Discuss the methodology for performing the LBD search. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.3.6.4 of LI-101. **NOTE: Ensure that electronic and manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
LRS, 50.59 – U2	LPSI w/10 seal, LPSI w/10 cooler, LPSI w/10 flow, LPSI w/10 minimum, minimum w/10 seal, minimum w/10 LPSI, service w/10 minimum, service w/15 service, Service water flow rates

LBDs/Documents reviewed manually:

ANO-2 SAR Chapters 9, Figure 9.2-22

D. Is the validity of this Review dependent on any other change? (See Section 5.3.4 of the EOI 10CFR50.59 Program Review Guidelines)

☐ Yes
☒ No

If "Yes," list the required changes.

III. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in an air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

15 ☐ ☒ Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

IV. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

A. Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

The Security Department answers the following questions if one of the questions was answered "yes".

B. Is the Security Plan actually impacted by the proposed activity? ☐ Yes ☐ No

C. Is a change to the Security Plan required? ☐ Yes Change # (optional) ☐ No

Name of Security Plan reviewer (print) / Signature / Date

V. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A, above.

A. Check the applicable boxes below. If any of the boxes are checked, a 50.59 Evaluation is not required. If none of the boxes are checked, perform a 50.59 Evaluation in accordance with Section VI. Provide supporting documentation or references as appropriate.

☐ The proposed activity meets all of the following criteria regarding design function per Section 5.6.1.1:

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of evaluation that demonstrates intended design function(s) of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed activity already exists per Section 5.6.1.2. Reference 50.59 Evaluation # _____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

☐ The NRC has approved the proposed activity or portions thereof per Section 5.6.1.3. Reference: _____

☐ The proposed activity is controlled by another regulation per Section 5.6.1.4.

B. Basis

Provide a clear, concise basis for determining the proposed activity may be exempted such that a third-party reviewer can reach the same conclusions. See Section 5.6.6 of the EOI 10CFR50.59 Review Program Guidelines for guidance.

VI. 50.59 EVALUATION

A. Executive Summary (Serves as input to NRC summary report. Limit to one page or less. Send an electronic copy to the site licensing department after OSRC approval, if available.)

Brief description of change, test, or experiment:

ER-ANO-2003-0793-000 evaluates the degraded condition of the Service Water System's ability to provide original design flow of 8 gpm to the LPSI pump seal coolers, 2E-52A and 2E-52B. The 8 gpm value is located on existing SAR Figure 9.2-22. The ER evaluated the minimum flow for heat removal and operational cleanliness is actually 2.5 gpm. The ER evaluation utilized two independent methods to arrive at the same 2.5 gpm value. The first method used the vendor's tech manual (TM I075.0200) curves to determine necessary flow. The second method utilized Flowserve's computer program to determine necessary flow. Both methods considered heat transfer requirements and fouling effects. Based on the results of the ER the new flow requirement is to be changed to 2.5 gpm.

The 8 gpm requirement was based on a memo from CE sent June 22, 1981. The memo did not provide calculations or justification for the required flow.

Reason for proposed Change:

ER-ANO-2003-0793-000 evaluates the degraded condition of the Service Water System's ability to provide original design flow of 8 gpm to the LPSI pump seal coolers, 2E-52A and 2E-52B. The reason for the change is to identify the actual minimum required flow of these heat exchangers.

50.59 Evaluation summary and conclusions

The evaluation concluded that 2.5 gpm service water flow rate is acceptable for maintaining the LPSI seal coolers operable.

B. License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes ☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:
   Neither the operability limits of LPSI pump seal cooler nor the service water flow rate through the cooler nor service water total system flow rates are inputs to accident frequency calculations evaluated in the SAR. Since these parameters are not inputs to those calculations they do not increase the frequency of evaluated accidents. To increase the frequency of occurrence of an accident any evaluated change would have to affect a Chapter 15 accident initiator. The coolers are not considered accident initiators. The lower service water flow rate will not affect the ability of the pump in performing its function.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The Engineering evaluation demonstrated that the LPSI pump seal cooler flow rate of 2.5 gpm is sufficient to maintain the cooler operable and therefore the pump operable. Since operability of these components is maintained the likelihood of equipment malfunction is not increased. There was no basis documented for the original 8 gpm flow listed on SAR figure 9.2-22.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The LPSI seal cooler and pump remain operable for all operational modes of the LPSI system with reduced cooler flow. The change in flow does not create a new configuration for the release of radioactive material. The radiological and accident consequences of a failure of these components have been evaluated and are not changed by adjusting cooler flow rate in this fashion. Since no new release configuration or failure mechanism is created that exceeded the release rates assumed in the SAR the consequences of an accident are not changed

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The change in flow does not create a new configuration for the release of radioactive material and does not impact opposite train components. The trains of LPSI and SDC remain independent. The frequency of malfunction on any component is not changed because the flow rate is evaluated as acceptable. The consequences for the failure of a component or single train are not changed. Since the frequency and consequences of each train are not changed the consequences have not changed and are still bounded by the analyses. Chapter 15 accident analysis assumes that a single failure to a safety train occurs during the response to an accident. The lower SW flow does not change how this failure might be manifested. Should a single failure occur, the results of a failure are not changed. No additional requirements are being imposed on the safety related pump. As a result, the consequences of this assumed single failure are not impacted by the lower SW water flow.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The change in flow rate through the cooler can not create a new type of accident because the cooler will still perform its intended function. Since its intended function is maintained the cooler flow rate does not create a condition that challenges the LPSI pump or service water in any new way. Since no new challenges or configurations are created there are no new accident possibilities. The lower service water flow does not result in the loss of any of the safety related pump in any evaluated accident scenario. Other accidents that are different than previously evaluated are not created since no new equipment is being added and no existing equipment is being required to function any differently than it has in the past.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS

The change in flow rate through the cooler can not create a new type of accident because the cooler will still perform its intended function. Since its intended function is maintained the cooler flow rate does not create a condition that challenges the LPSI pump or service water in any new way. Since no new challenges or configurations are created there are no new accident possibilities. The ER evaluates the minimum service water flow at the highest expected service water temperature to maintain the safety related pump Operable. The design coolers have not changed and they will still provide adequate heat rejection so that the safety related pump can perform its function. Failure of the pump is postulated in the SAR failure modes analysis; however, no different equipment malfunctions are postulated because of the evaluated change.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

Fission product barriers are specifically identified as fuel cladding, reactor coolant system boundary, and containment. Since the evaluation doesn't adversely impact reactor power, core design, RCS pressure boundary material or containment design pressure the design basis for a fission product barrier is not impacted. The seal cooler will be operable with the lower flows and therefore the LPSI pump seal will remain operable. Since the seal remains operable no new leakage path is created and no limit is exceeded.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

A lower service water flow requirement does not constitute a method of evaluation as defined in the SAR. The evaluation used established methods for determining flow requirements. There is no documented analysis for the original value of 8 gpm. The new value of 2.5 gpm is based on two different and acceptable methods.

ANO 50.59 Evaluation Number

2004-014

I. OVERVIEW / SIGNATURES

Facility: ANO - Unit 2

Document Reviewed: ER-ANO-2003-0793-001 **Change/Rev.:** 0

System Designator(s)/Description: SDC/Shutdown Cooling

Description of Proposed Change

ER-ANO-2003-0793-000 and -001 evaluates the degraded condition of the U2 Service Water system's ability to provide the original design flow to the SDC pump seal coolers, 2E-52 A&B. The existing design value shown in the U2 SAR and on M-2250 Sheet 1 is 8 GPM. The minimum acceptable flow for operability and functionality of the coolers is 2.5 GPM of SW. The ER evaluation used both the Flowserve calculation summary sheet and the method described in the 2E-52 A&B Technical Manual for concluding that 2.5 GPM is the minimal acceptable flow for ANO2's application. The design flow will remain at 8 GPM and the minimum flow for functionality is 2.5 GPM.

This 10CFR50.59 review supercedes the 10CFR50.59 Evaluation Exemption in ER-ANO-2003-0792-000 and the 10CFR50.59 Review recorded in OSRC minutes as FFN 03-031.

If the proposed activity, in its entirety, involves any one of the criteria below, check the appropriate box, provide a justification/basis in the Description above, and forward to a Reviewer. No further 50.59 Review is required. If none of the criteria is applicable, continue with the 50.59 Review.

- ☐ The proposed activity is editorial/typographical as defined in Section 5.2.2.1.
- ☐ The proposed activity represents an "FSAR-only" change as allowed in Section 5.2.2.2_____. (Insert item # from Section 5.2.2.2).

If further 50.59 Review is required, check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	SCREENING	Sections I, II, III, and IV required
☐	50.59 EVALUATION EXEMPTION	Sections I, II, III, IV, and V required
☒	50.59 EVALUATION (#: ~~04-013~~ 04-014 5/6/04	Sections I, II, III, IV, and VI required

Preparer: Tim Woodson/ Timothy R. Woodson /EOI/DE/ 2-13-04
Name (print) / Signature / Company / Department / Date

Reviewer: Bill Kistler/ William A Kistler /EOI/DE/ 2-13-2004
Name (print) / Signature / Company / Department / Date

OSRC J.N. Miller, Jr. / 05/13/04
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings (see Section 5.9) and 50.59 Evaluations.]

List of Assisting/Contributing Personnel:

Name: **Scope of Assistance:**

II. SCREENING

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113 (Reference 2.2.13). (See Section 5.1.13 for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # and/or SECTIONS IMPACTED
FSAR	☒	☐	DRN 04-167 (M-2250 Sheet 1) to U2 SAR Figure 9.2-22
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Reports[1]	☐	☒	
If "YES", perform an Exemption Review per Section V OR perform a 50.59 Evaluation per Section VI AND initiate an LBD change in accordance with NMM LI-113 (Reference 2.2.13).			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2]	☐	☒	
Fire Protection Program[3] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculation Manual[3]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM LI-113 (Reference 2.2.13).			

2. Does the proposed activity involve a test or experiment not described in the FSAR? ☐ Yes ☒ No
If "yes," perform an Exemption Review per Section V OR perform a 50.59 Evaluation per Section VI.

3. Does the proposed activity potentially impact equipment, procedures, or facilities utilized for storing spent fuel at an Independent Spent Fuel Storage Installation? ☐ Yes ☒ No ☐ N/A
(Check "N/A" if dry fuel storage is not applicable to the facility.)
If "yes," perform a 72.48 Review in accordance with NMM Procedure LI-112.
(See Sections 1.5 and 5.3.1.5 of the EOI 10CFR50.59 Review Program Guidelines.)

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[1] If "YES," see Section 5.1.4. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Evaluation.
[3] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition.

B. **Basis**

Provide a clear, concise basis for the answers given in the applicable sections above. Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. *Simply stating that the change does not affect TS or the FSAR is not an acceptable basis.* See EOI 50.59 Guidelines Section 5.6.6 for guidance.)

The design value of 8 GPM for the 2E-52 A&B coolers is not being changed. The ER evaluation concludes that the minimum acceptable service water flow through the 2E52 A&B coolers is 2.5 GPM. With 2.5 GPM flow, there is no loss of any 2E-52 A&B heat transfer functions and no degradation or loss of function to the mechanical seals in the 2P-60 A&B LPSI pumps or the LPSI/SDC systems. A note is being added to SAR Figure 9.2-22 to specify the minimum acceptable flow is 2.5 GPM. The 2E-52 A&B heat exchangers are not required to reject heat to satisfy any LPSI support functions, they are required to reject heat during some periods of Shutdown Cooling to optimize the LPSI pump mechanical seal life.

The Operating License does not specify flow rates through heat exchangers and adding a note to SAR Figure 9.2-22 for minimum flow through the 2E-52 A&B heat exchangers is below the level of detail in the Operating License. The ANO2 LBDs specify a design flow of 8 GPM in SAR Figure 9.2-22. The design flow value is not being changed. The minimum flow for 2E-52 A&B operability is 2.5 GPM and that is being noted on the SAR figure. No design values or functions are being altered by this ER. Noting the minimal acceptable service water flow value for operability through the 2E-52 A&B heat exchangers does not constitute a test or experiment. The U2 Service Water system is tested during refueling outages to ensure that design values are met or if not corrective actions are taken to restore flows to Service Water components. This ER does not affect any ISFI equipment or processes.

C. **References**

Discuss the methodology for performing the LBD search. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.3.6.4 of LI-101. **NOTE: Ensure that electronic and manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
All, 50.59-Unit 2	LPSI w/10 seal, LPSI w/10 cooler, LPSI w/10 flow, LPSI w/10 minimum, minimum w/10 seal, service w/10 minimum.

LBDs/Documents reviewed manually:

ANO2 SAR Chapter 9, Figure 9.2-22

D. **Is the validity of this Review dependent on any other change?** (See Section 5.3.4 of the EOI 10CFR50.59 Program Review Guidelines)

☐ Yes
☒ No

If "Yes," list the required changes.

III. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in an air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

IV. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

A. Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

The Security Department answers the following questions if one of the questions was answered "yes".

B. Is the Security Plan actually impacted by the proposed activity? ☐ Yes ☐ No

C. Is a change to the Security Plan required? ☐ Yes Change # (optional) ☐ No

Name of Security Plan reviewer (print) / Signature / Date

V. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A, above.

A. Check the applicable boxes below. If any of the boxes are checked, a 50.59 Evaluation is not required. If none of the boxes are checked, perform a 50.59 Evaluation in accordance with Section VI. Provide supporting documentation or references as appropriate.

☐ The proposed activity meets all of the following criteria regarding design function per Section 5.6.1.1:

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of evaluation that demonstrates intended design function(s) of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed activity already exists per Section 5.6.1.2. Reference 50.59 Evaluation # _____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

☐ The NRC has approved the proposed activity or portions thereof per Section 5.6.1.3. Reference: _____

☐ The proposed activity is controlled by another regulation per Section 5.6.1.4.

B. Basis

Provide a clear, concise basis for determining the proposed activity may be exempted such that a third-party reviewer can reach the same conclusions. See Section 5.6.6 of the EOI 10CFR50.59 Review Program Guidelines for guidance.

An evaluation is included.

VI. 50.59 EVALUATION

A. **Executive Summary** (Serves as input to NRC summary report. Limit to one page or less. Send an electronic copy to the site licensing department after OSRC approval, if available.)

Brief description of change, test, or experiment:

Reason for proposed Change:

50.59 Evaluation summary and conclusions

Per the note below step 5.7.1 in LI-101 Revision 3, ANO is not required to fill out section VI.A in accordance with step 5.7.1.1.

B. **License Amendment Determination**

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes ☐ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:
   Chapter 15 of the U2 SAR evaluates "Loss of Service Water System" and states that no single failure of an active or passive component in the Service Water system can lead to a LOCA. The 2E-52 A&B coolers are passive components and this ER does not evaluate the loss of any heat transfer functions at reduced service water flow through the heat exchangers. The 2E-52 A&B heat exchangers are not accident initiators and there is no change in the frequency of occurrence described in any Chapter 15 design bases accident.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:
   The 2E-52 A&B heat exchangers are not required to provide heat transfer to support LPSI functions. The heat exchangers are required to reject heat to the service water to support Shutdown Cooling Functions with RCS temperatures between160°F and 300°F to optimize the mechanical seal life of the 2P-60 LPSI pumps. Since the 2E-52 A&B heat exchangers can satisfy all their design functions with 2.5 GPM of Service Water flow the increase in any malfunction is considered minimal.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:
   The 2P-60 A&B LPSI pump mechanical seals are required to provide minimal leakage during an accident to minimize an offsite dose release. The LPSI system is identified as a system that is connected to containment after an accident and is relied upon to prevent the migration of radioactive materials from the containment building to the auxiliary building. The 2P-60 LPSI pumps are secured when the ECCS systems switch to the containment sump as a suction source. Since the 2P-60 LPSI seals are not required to be cooled after a RAS signal is initiated and the 2E-52 A&B heat exchangers are capable of removing any heat loads with 2.5 GPM of water, there is no increase in the likelihood that the LPSI seals will leak more than the values permitted in the U2 SAR (Total ECCS leakage is 2060 cc/hr).

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:
The 2E-52 A&B heat exchangers are capable of performing all their design functions with 2.5 GPM of Service Water. The components will be operated within their capabilities without undue loading or operated in a different manner than before. Chapter 15 of the SAR and Table 9.2-5 both state that a single failure of a component will not result in a LOCA and there is no increase in accident consequences per question 3. The loss of Service Water Accident described in section 15.1.20 is still bounding. Since the heat exchangers and the mechanical seals in the 2P-60 LPSI pumps will not experience any loss of functionality, there is no more than a minimal increase in the consequences of a malfunction previously evaluated in the SAR.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:
The ER concludes that the 2E-52 A&B will satisfy all of its design functions with 2.5 GPM of service water flowing through each heat exchanger. Chapter 15 of the U2 SAR already evaluates the loss of the Service Water System and discusses various failure scenarios in Table 9.2-5. Since the heat exchangers will satisfy all their design functions, no new accidents are created and the Chapter 15 accidents are still bounding.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS
The 2E-52 A&B heat exchangers are not considered by the SAR to be accident initiators. This ER concludes that the heat exchangers will satisfy their design functions with a minimum of 2.5 GPM even though that is below the 8 GPM design value. Chapter 15 evaluates the loss of the Service Water System and this change does not affect that analysis. The heat exchangers are no more likely to fail and cause a different accident than loss of Service Water by allowing measured, actual flows to drop below design flows.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:
This ER concludes that the 2E-52 A&B heat exchangers will satisfy all their design functions with 2.5 GPM of Service Water flow. As such, they will adequately support LPSI and SDC system functions and will not cause any limits associated with the fission product barriers to be affected.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:
The design value of 8 GPM was selected during ANO2's original design and is not formally documented. The ER evaluates the lowered flow using two different methods that independently reach the same results. The lower value is the minimum Service Water flow required for the 2E-52 A&B heat exchangers to satisfy their heat transfer functions. The SAR lists the 8 GPM value, but does not implicitly or explicitly explain the methodology for arriving at that value. Therefore the evaluation by this ER is acceptable and does not cause information in the SAR to be untrue.

ANO 50.59 Evaluation Number

2004-015

I. OVERVIEW / SIGNATURES

Facility: ANO- Unit 2

Document Reviewed: ANO-2 Technical Requirements Manual (TRM) — **Change/Rev.:** 17
ANO-2 SAR — 18
ANO-2 Technical Specification Bases — 6

System Designator(s)/Description: Pressurizer Heat Up and Cool Down Limits

Description of Proposed Change

The NRC approved the relocation of the pressurizer heat up and cool down limits (and associated Bases) from the TSs to the TRM in Amendment 253 on May 4, 2004. Therefore, this change incorporates the previous TS 3.4.9.2 into a new TRM 3.4.9.2. The relocation resulted in minor wording and editorial changes in order to accommodate TRM formatting and usage rules (including minor expansion of the Bases) that meet the screening criteria of LI-101 and are, therefore, not discussed further in this evaluation. However, two other changes were made to these requirements during their relocation to the TRM. These include (1) revision of the pressurizer cool down limits in accordance with condition report CR-ANO-2-2003-1082, corrective action 007 which reduces the allowable cool down rate for given RCS temperatures (affects the TRM and the SAR), and (2) revision of the shutdown portion of the previous TS action consistent with industry TRM guidelines. Item (1) above is a more restrictive change and meets the exemption criteria of LI-101. Item (2) above is a less restrictive change and is therefore evaluated in Section VI. Because the changes to the TRM meet all three criteria, all three boxes are checked below.

If the proposed activity, in its entirety, involves any one of the criteria below, check the appropriate box, provide a justification/basis in the Description above, and forward to a Reviewer. No further 50.59 Review is required. If none of the criteria is applicable, continue with the 50.59 Review.

☐ The proposed activity is editorial/typographical as defined in Section 5.2.2.1.

☐ The proposed activity represents an "FSAR-only" change as allowed in Section 5.2.2.2_____. (Insert item # from Section 5.2.2.2).

If further 50.59 Review is required, check the applicable review(s): (Only the sections indicated must be included in the Review.)

☒	SCREENING	Sections I, II, III, and IV required
☒	50.59 EVALUATION EXEMPTION	Sections I, II, III, IV, and V required
☒	50.59 EVALUATION (#:04-015)	Sections I, II, III, IV, and VI required

Preparer: David Bice / [signature] / EOI / Licensing / 05-05-2004
Name (print) / Signature / Company / Department / Date

Reviewer: Dana Millar / [signature] / EOI / Licensing / 05-05-2004
Name (print) / Signature / Company / Department / Date

OSRC [signature] 05/13/04 / J. N. Miller, Jr.
Chairman's Signature / Date
[Required only for Programmatic Exclusion Screenings (see Section 5.9) and 50.59 Evaluations.]

List of Assisting/Contributing Personnel:

Name:	Scope of Assistance:
None	None

II. SCREENING

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS TO BE REVISED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113 (Reference 2.2.13). (See Section 5.1.13 for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # and/or SECTIONS TO BE REVISED
FSAR	☒	☐	ANO-2 SAR Section 5.2.1.5 and 5.5.10.1
TS Bases	☒	☐	ANO-2 Bases page 3/4 4-7
Technical Requirements Manual	☒	☐	New TRM 3.9.4.2 and associated Bases
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Reports[1]	☐	☒	
If "YES", perform an Exemption Review per Section V OR perform a 50.59 Evaluation per Section VI AND initiate an LBD change in accordance with NMM LI-113 (Reference 2.2.13).			

LBDs controlled under other regulations	YES	NO	CHANGE # and/or SECTIONS TO BE REVISED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2]	☐	☒	
Fire Protection Program[3] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculation Manual[3]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM LI-113 (Reference 2.2.13).			

2. Does the proposed activity involve a test or experiment not described in the FSAR? ☐ Yes ☒ No
If "yes," perform an Exemption Review per Section V OR perform a 50.59 Evaluation per Section VI.

3. Does the proposed activity potentially impact equipment, procedures, or facilities utilized for storing spent fuel at an Independent Spent Fuel Storage Installation? ☐ Yes ☒ No ☐ N/A
(Check "N/A" if dry fuel storage is not applicable to the facility.)
If "yes," perform a 72.48 Review in accordance with NMM Procedure LI-112.
(See Sections 1.5 and 5.3.1.5 of the EOI 10CFR50.59 Review Program Guidelines.)

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[1] If "YES," see Section 5.1.4. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Evaluation.
[3] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition.

B. **Basis**

Provide a clear, concise basis for the answers given in the applicable sections above. Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis. See EOI 50.59 Guidelines Section 5.6.6 for guidance.)

As stated previously, the editorial and administrative changes resulting from the relocation of requirements from the TS to the TRM meet the screening criteria of LI-101 and are not discussed further in this assessment. Further restricting the rates of pressurizer cool down is conservative to the previous TS limits. The new cool down rates have been implemented in plant procedures since 2003 when a re-evaluation of the pressurizer heater nozzles was conducted due to identification of nozzle leaks and installation of MNSA clamps. This assessment indicated a need to reduce the pressurizer cool down rates to limit the extent of flaw growth and increase the life of the pressurizer heater nozzles. The ASME Section XI fracture mechanics and fatigue analyses of the ANO-2 pressurizer heater sleeves to qualify J-groove weld/cladding flaws left in place following an outside diameter (OD) repair had been performed by Structural Integrity Associates (SI), reviewed by Central Engineering Programs and determined to be appropriate. From the SI analyses, the J-groove weld/cladding flaws in an outermost heater sleeve penetration meet ASME Section XI, IWB-3600, for all transients as given in the Pressurizer Design Specifications and for the modified cool down transient. This modified cool down transient consists of a 175 °F/hr cool down from ≤ 653 °F to > 200 °F, followed by a 100 °F/hr cool down from ≤ 200 °F to ≥ 80 °F. The detailed SI report is attached to Corrective Action 007 response to CR-ANO-2-2003-1082. Because changing the pressurizer cool down rates will bring the TRM/SAR into compliance with the current license basis and is more restrictive than the previous TS limits, this change does not require further evaluation under 10 CFR 50.59. Furthermore, this change does not introduce a new test or experiment not previously described in the SAR. No other TS, OL, or other NRC-controlled document is affected by this change.

The omission of the shutdown requirement portion of the previous TS Action in the new TRM is considered a less restrictive change and is therefore evaluated under 10 CFR 50.59 (see Section VI). However, this change has no impact on any other LBD nor does it introduce a new test or experiment not previously described in the SAR.

C. **References**

Discuss the methodology for performing the LBD search. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.3.6.4 of LI-101. **NOTE: Ensure that electronic and manual searches are performed using controlled copies of documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
LRS Unit 2 50.59	pressurizer w/10 rate*, pressurizer w/10 shut*, cool* w/5 rate AND pressurizer, 200 w/2 F AND pressurizer, 175 w/2 F AND pressurizer

LBDs/Documents reviewed manually:

SAR Sections 5.2.1.5, 5.2.4.3.1, 5.5.10.1, Table 5.2-1.

D. **Is the validity of this Review dependent on any other change?** (See Section 5.3.4 of the EOI 10CFR50.59 Program Review Guidelines)

☐ Yes
☒ No

If "Yes," list the required changes.

III. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in an air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

IV. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

A. Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

The Security Department answers the following questions if one of the questions was answered "yes".

B. Is the Security Plan actually impacted by the proposed activity? ☐ Yes ☐ No

C. Is a change to the Security Plan required? ☐ Yes Change # (optional) ☐ No

Name of Security Plan reviewer (print) / Signature / Date

V. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A, above.

A. Check the applicable boxes below. If any of the boxes are checked, a 50.59 Evaluation is not required. If none of the boxes are checked, perform a 50.59 Evaluation in accordance with Section V. Provide supporting documentation or references as appropriate.

☒ The proposed activity meets all of the following criteria regarding design function per Section 5.6.1.1:

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; AND

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; AND

The proposed activity does not adversely affect a method of evaluation that demonstrates intended functions of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed change already exists per Section 5.6.1.2. Reference 50.59 Evaluation # _____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

☒ The NRC has approved the proposed activity or portions thereof per Section 5.6.1.3. Reference: ANO-2 TS Amendment 253 dated May 4, 2004

☐ The proposed activity is controlled by another regulation per Section 5.6.1.4.

B. Basis

Provide a clear, concise basis for determining the proposed activity may be exempted such that a third-party reviewer can reach the same conclusions. See Section 5.6.6 of the EOI 10CFR50.59 Review Program Guidelines for guidance.

ANO-2 TS Amendment 253 is referenced above as this approved the relocation of the pressurizer heat up and cool down rate limits and Bases from the TSs to the TRM. As discussed previously, the cool down rate has been altered during the relocation to the TRM, which also results in a change to the SAR. The new cool down rates are conservative to the previous TS limits and are consistent with the current license basis as evaluated in condition report CR-ANO-2-2003-1082. Therefore, this change does not impact the design function of any SSC nor does it affect the method of controlling or evaluating the design function of any SSC.

The omission of the shutdown requirement portion of the previous TS Action in the new TRM does not meet the exemption criteria of 10 CFR 50.59 and is further evaluated in Section VI.

VI. 50.59 EVALUATION

A. <u>Executive Summary</u> (Serves as input to NRC summary report. Limit to one page or less. Send an electronic copy to the site licensing department after OSRC approval, if available.)

Brief description of change, test, or experiment:

Per LI-101, this section is not applicable to ANO.

Reason for proposed Change:

Per LI-101, this section is not applicable to ANO.

50.59 Evaluation summary and conclusions

Per LI-101, this section is not applicable to ANO.

B. <u>License Amendment Determination</u>

Does the proposed Change being evaluated represent a change to a method of evaluation <u>ONLY</u>? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes ☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   The omission of the shutdown requirement from the new TRM does not result in more than a minimal increase in the frequency of any accident evaluated in the SAR because exceeding the heat up or cool down rate with regard to pressurizer structure is not considered an accident initiator and only affects the service life of the pressurizer due to nozzle fatigue. Evaluating the effects of exceeding these limits within the ANO condition reporting system meets the overall intent of the previous TS to ensure a timely assessment of any fatigue impact on pressurizer components. Any effects would be considered to be long term and not immediately detrimental to the operation of the pressurizer structure. As a conservative measure, however, pressurizer pressure is prohibited from being increased when operating at or above 500 psig until this evaluation is completed. Furthermore, action statements do not determine the unit capability for meeting a safety function or change any associated performance characteristics. TRM-related SSCs have been shown to not meet the criteria of 10 CFR 50.36 for inclusion in the TSs and are subsequently not required to ensure accident prevention or mitigation. This proposed change does not impact an accident currently described in the SAR. The omission of the previous TS action shutdown requirement from the TRM does not result in more than a minimal increase in the frequency of occurrence of an accident evaluated in the SAR.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   The omission of the shutdown statement does not prevent evaluation of condition effects in accordance with the ANO corrective action program. This is consistent with SAR 13.8.1 which states, "Failure to comply with a requirement of the TRM will be evaluated in accordance with the ANO corrective action program." This change removes actions that may be unnecessary based on the current plant condition and the condition of required equipment while ensuring that an evaluation is promptly performed to determine the best course of action that supports continued safe plant operation. Since appropriate corrective action will continue to be taken upon exceeding any pressurizer heat up or cool down rate limit, the frequency of occurrence of pressurizer failure is not significantly increased. Furthermore, exceeding these limits is not assumed to result in the malfunction of SSCs important to safety in the SAR. This proposed change does not impact the continued ability to meet the structural analysis requirements of the ANO-2 design basis.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

Allowing the effects of exceeding a pressurizer heat up or cool down limit to be evaluated under the ANO corrective action program in lieu of requiring a plant shutdown does not introduce an increase in the consequences of any accident. These limits are not relied upon in the design basis accident or transient analyses as a primary success path which functions or actuates to mitigate such events. Exceeding these limits and the resultant impact on the pressurizer structure is not considered an accident initiator. As stated previously, TRM-related SSCs do not meet the criteria of 10 CFR 50.36 and the loss of these SSCs are not assumed to initiate an accident nor are relied upon in the SAR to ensure mitigation of an accident. Therefore, this change does not result in an increase in the consequences of an accident described in the SAR.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The omission of the shutdown statement only modifies the actions to be taken when specified operating limits have been exceeded. No change to the design or function of any SSC is proposed. Therefore, no possibility of any new malfunction of an SSC described in the SAR is created. Subsequently, the dose consequences of any malfunction or accident previously evaluated in the SAR is not altered by the proposed changes.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The proposed change does not create any physical change to the plant or plant SSCs. The proposed change acts to provide appropriate actions to be taken when pressurizer heat up or cool down rate limits are exceeded. The modified actions do not introduce a new accident type since failure of the pressurizer due to exceeding heat up or cool down rate limits is not assumed in the SAR.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS

The omission of the shutdown statement only modifies the actions to be taken when specified operating limits have been exceeded. No change to the design, operation, or function of any SSC is proposed. Therefore, no possibility of any new malfunction of an SSC described in the SAR is created and, subsequently, the evaluated results of any such malfunction described in the SAR are not affected.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

The omission of the shutdown statement does not impact the fuel clad, RCS pressure boundary, or the containment. Therefore, no design basis limits associated with fission product barriers are affected.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

The omission of the shutdown statement does not correspond to or affect any method of evaluation described within or without the SAR. The proposed change provides appropriate actions for events that result in the pressurizer heat up or cool down rate limits being exceeded and are consistent with the previous TS-related actions with the exception of the requirement to perform a shutdown of the unit under certain conditions. No change to any input parameter for dose assessment or design basis methodologies has resulted due to any of the proposed changes.

ANO 50.59 Evaluation Number

2004-016

I. OVERVIEW / SIGNATURES

Facility: ANO - Unit 2

Document Reviewed: ER-ANO-2000-3275-003/TAP-04-02-002 **Change/Rev.:** 0

System Designator(s)/Description: Temporary Alteration to maintain #2 HPSI Header Pressurized.

Description of Proposed Change

This Temporary Alteration provides the design and instructions to install an air operated positive displacement pump for maintaining the #2 HPSI header pressurized. The new installation is designated as the HPSI Pressurization System (HPS) and includes a section of piping, valves and the air operated positive displacement pump that are not seismically qualified. From the HPSI header, the seismically qualified pressure boundary will be at two new check valves and two test loop globe valves. From the RWT, the seismically qualified pressure boundary will be at two existing sample line valves. The T-alt provides instructions for staging, installing, operating, and removing tubing, valves, pump and accessories. The positive displacement pump will pump borated water as needed from the RWT into the HPSI #2 header in order to keep it pressurized to about 635 psi in order to keep gas from the SIT(s) in solution in the HPSI header. This change will remain in effect until a permanent modification is installed or the T-Alt is removed. Valve lineup changes are made to procedures 2104.005, 2104.039, 2104.024, 2607.012 and the actions to be taken for RWT low level alarm are being changed in procedure 2203.012F. The scope of this change does not include any changes that exist because of back leakage into the safety injection system from the SIT(s) through the SIT discharge check valve(s). The scope of this change is apportioned into the following categories for this review.

1) connection to the #2 HPSI header out to seismically qualified pressure boundary at 2HPS-08 including the leak testing loop to the floor drain through 2HPS-14.

2) connection to RWT outlet sample piping to 2HPS-08 including the functional aspects of pumping into the HPSI header.

3) connection to instrument air to supply motive power for 2HPS-P-1 including the portion of the pump and its operation outside the process flow

4) changes to procedure 2104.005, valve alignment of existing RWT interface valves

5) changes to procedure 2104.039, including valve alignment of existing HPSI header interface valves and testing of new check valves

6) changes to procedure 2104.024, valve alignment of existing instrument air interface valves

7) changes to procedure 2203.012F including the new action for low RWT level alarm

8) changes to procedure 2607.012, new alignment for chemistry sampling of RWT

If the proposed activity, in its entirety, involves any one of the criteria below, check the appropriate box, provide a justification/basis in the Description above, and forward to a Reviewer. No further 50.59 Review is required. If none of the criteria is applicable, continue with the 50.59 Review.

☐ The proposed activity is editorial/typographical as defined in Section 5.2.2.1.

☐ The proposed activity represents an "FSAR-only" change as allowed in Section 5.2.2.2_____. (Insert item # from Section 5.2.2.2).

If further 50.59 Review is required, check the applicable review(s): (Only the sections indicated must be included in the Review.)

☒	SCREENING	Sections I, II, III, and IV required
☐	50.59 EVALUATION EXEMPTION	Sections I, II, III, IV, and V required
☒	50.59 EVALUATION (#:04-016)	Sections I, II, III, IV, and VI required

Preparer: Daniel H. Williams/ [signature] /EOI/NE/5-18-04
Name (print) / Signature / Company / Department / Date

Reviewer: STEVEN L. SMITH/ [signature] / EOI/SYS ENGR/ 5/20/04
Name (print) / Signature / Company / Department / Date

OSRC J.R. Eichenberger [signature] 6-2-04
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings (see Section 5.9) and 50.59 Evaluations.]

List of Assisting/Contributing Personnel:

Name:	Scope of Assistance:
Kathy Ashley	PSA, HELB, Dose
Steve Bennett	Licensing, 50.59

II. SCREENING

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113 (Reference 2.2.13). (See Section 5.1.13 for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # and/or SECTIONS IMPACTED
FSAR	☒	☐	Fig. 9.3-1, Sht. 3 (scope items 3&6); Fig. 6.2-17 (scope items 2&4); Fig. 6.3-2 (scope items 1&5) and §3.6.4.2.6.1 (scope item 2)
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Reports[1]	☐	☒	
If "YES", perform an Exemption Review per Section V OR perform a 50.59 Evaluation per Section VI AND initiate an LBD change in accordance with NMM LI-113 (Reference 2.2.13).			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2]	☐	☒	
Fire Protection Program[3] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculation Manual[3]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM LI-113 (Reference 2.2.13).			

2. Does the proposed activity involve a test or experiment not described in the FSAR?
If "yes," perform an Exemption Review per Section V OR perform a 50.59 Evaluation per Section VI.

☐ Yes
☒ No

3. Does the proposed activity potentially impact equipment, procedures, or facilities utilized for storing spent fuel at an Independent Spent Fuel Storage Installation?
(Check "N/A" if dry fuel storage is not applicable to the facility.)
If "yes," perform a 72.48 Review in accordance with NMM Procedure LI-112.
(See Sections 1.5 and 5.3.1.5 of the EOI 10CFR50.59 Review Program Guidelines.)

☐ Yes
☒ No
☐ N/A

[1] If "YES," see Section 5.1.4. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Evaluation.
[3] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition.

B. Basis

Provide a clear, concise basis for the answers given in the applicable sections above. Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis. See EOI 50.59 Guidelines Section 5.6.6 for guidance.)

Scope items 7 and 8 screen out, i.e. the level of detail involved in these two items is below that found in any licensing basis documents.

Implementation of this change will require administratively maintaining the RWT level at a value high enough above the Technical Specification required minimum RWT available volume to offset any inventory loss that may occur due to leakage out a broken line in the non-seismic portion of the HPS prior to automatic switchover to recirculation following a LOCA. This administrative control (already in place through alarm response procedures) maintains the Technical Specification limit on minimum RWT available volume as it is carefully defined in the Technical Specification Bases and in regulatory correspondence related to amendment #244 to the Technical Specifications which established the current Technical Specification 3.5.4.a limit on minimum RWT available volume. The Technical Specification limit on maximum RWT available volume will not be compromised because the administratively controlled level (which requires no change as a result of the implementation of this change) remains within that limit. The basis for these maximum and minimum RWT limits clearly states that, "[t]he available water volume limits represent the analytically assumed maximum and minimum volume of water that can be transferred from the refueling water tank to containment via the emergency core cooling system and containment spray before pump suction is switched to the sump." The correspondence related to amendment #244 to the Technical Specifications is even more explicit in this regard. The request for this amendment (2CAN120001) indicated that, "The new [RWT available volume] range no longer applies directly to water contained in the tank; rather, the new range represents the minimum and maximum volume of water available to be transferred from the refueling water tank into containment via the ECCS and containment spray before the pump suction is transferred to the containment sump by the recirculation actuation signal."The values in the bases reflect the current alarm response procedures and continue to assure compliance with the Technical Specification RWT available volume limits, even with implementation of this change. In the SER for Technical Specification amendment #244 (2CNA040207), NRC found that putting the indicated level values in the Technical Specification Bases instead of in the Technical Specification and, therefore, under licensee control, was acceptable because changes to the values would still be subject to the limitations of 10CFR50.59. For implementation of this change, no changes are required to either the Technical Specification or the Technical Specification Bases because the indicated values in the bases will still be used for level control and those values still assure compliance with the Technical Specification limits which remain valid.

The interties of the HPS with the HPSI system and the RWT and the instrument air system affect SAR Figures 9.3-1, Sht. 3; 6.2-17 and 6.3-2. The operation of the HPS pump makes the statement in SAR §3.6.4.2.8.1 that "portions of the SIS outside containment will be above 275 psig or 200°F high energy piping criteria less than two percent of system operating time" no longer true. The alignment changes in procedures 2104.005, 2104.024 and 2104.039 affect the position designation of the existing valves that interface with the new interties on SAR Figures 9.3-1, 6.2-17 and 6.3-2. None of the other licensing basis documents (including the OL and TS) include this type of information.

The testing described in supplement 10 to procedure 2104.039 is consistent with the testing of other HPSI header pressure boundary valves. None of this testing is within the scope of the SAR. No other test or experiment is involved in this change.

C. References

Discuss the methodology for performing the LBD search. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.3.6.4 of LI-101. **NOTE: Ensure that electronic and manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
LRS 50.59 - Unit 2	HPSI Header, HPSI Pressurization, Injection Header, HPSI Drain, HPSI Vent, RWT Sample, RWT Sampling, RWT Drain, RWT Vent, RWT Alarm, RWT Level, Refueling Water Tank Level, Refueling Water Tank Drain, Refueling Water Tank Vent, Refueling Water Tank Sample

LBDs/Documents reviewed manually:

ANO-2 SAR and Tech Spec Table 3.3-3 Action 10 and all other LBDs (OL, NRC Orders, TS Bases, TRM, COLR, NRC SERs, QAPM, EP, FPP and ODCM) for scope

D. **Is the validity of this Review dependent on any other change?** (See Section 5.3.4 of the EOI 10CFR50.59 Program Review Guidelines)

☐ Yes
☒ No

If "Yes," list the required changes.

III. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in an air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

IV. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

A. Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

The Security Department answers the following questions if one of the questions was answered "yes".

B. Is the Security Plan actually impacted by the proposed activity? ☐ Yes ☐ No

C. Is a change to the Security Plan required? ☐ Yes Change # (optional) ☐ No

Name of Security Plan reviewer (print) / Signature / Date

V. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A, above.

A. Check the applicable boxes below. If any of the boxes are checked, a 50.59 Evaluation is not required. If none of the boxes are checked, perform a 50.59 Evaluation in accordance with Section VI. Provide supporting documentation or references as appropriate.

☐ The proposed activity meets all of the following criteria regarding design function per Section 5.6.1.1:

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; AND

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; AND

The proposed activity does not adversely affect a method of evaluation that demonstrates intended design function(s) of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed activity already exists per Section 5.6.1.2. Reference 50.59 Evaluation # _____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

☐ The NRC has approved the proposed activity or portions thereof per Section 5.6.1.3. Reference: _____

☐ The proposed activity is controlled by another regulation per Section 5.6.1.4.

B. Basis

Provide a clear, concise basis for determining the proposed activity may be exempted such that a third-party reviewer can reach the same conclusions. See Section 5.6.6 of the EOI 10CFR50.59 Review Program Guidelines for guidance.

VI. 50.59 EVALUATION

A. **Executive Summary** (Serves as input to NRC summary report. Limit to one page or less. Send an electronic copy to the site licensing department after OSRC approval, if available.)

Brief description of change, test, or experiment:

Per LI-101, this section is not applicable to ANO and, therefore, does not require completion.

Reason for proposed Change:

Per LI-101, this section is not applicable to ANO and, therefore, does not require completion.

50.59 Evaluation summary and conclusions

Per LI-101, this section is not applicable to ANO and, therefore, does not require completion.

B. License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes ☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   The sphere of influence of this change is limited to systems used to mitigate accidents. Because the pressurization pump can only take suction from the RWT, there is no potential to cause a boron dilution event. There is no potential relationship to the initiation of any of the other SAR chapter 15 events.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   There will be two more valves in the ECCS recirculation fluid boundary than there are currently. These will be check valves which must close. The check valve failure to close rate used in the ANO-2 EOOS model (calc. 97-E-0036-02, Rev. 5, failure rate files listed in Table 12) is 4.93E-4. The increase in probability of ECCS recirculation fluid bounday failure is the square of this value because there are two valves in series. This increase is 2.43E-7 which is a minimal increase. This is a conservative result because it assumes that the non-seismic portion of the HPS is not there, i.e. the internal check valves in the pump are not credited.

   There is no increase in the probability of introducing air into the HPSI header because the pressurization pump is only capable of pumping air into a discharge pressure of 50 psig or less. HPSI flow tests with the RV head removed have shown that the header pressure does not drop below about 280 psig.

   Pumping additional flow into the #2 HPSI header cold leg injection line after aligning for hot leg injection may slightly redistribute flow between the hot leg and cold leg but cannot cause a net reduction of flow in either injection path. Any redistribution between the two paths will be too small to be a confusion factor for the operators.

   A break in the non-seismic portion of the HPS could cause a loss of RWT inventory. However, procedures administratively controlling the RWT level to a level in excess of safety analysis credited RWT inventory level will assure that the maximum potential 22 gpm gravity flow through this break will not reduce the inventory below that required to support accident mitigation functions if the break occurs during a LOCA. The current RWT level alarm setpoints and the response to those assure this. The pumping capacity of the pressurization pump is significantly below the potential gravity induced flow out of a broken pipe. The slow drain rate through a broken line will also permit adequate time for the detection of the drop in RWT level through normal monitoring and isolation of the broken line.

   A break in the HPSI header will now be a HELB due to the pressure in the HPSI header being above 275 psig more than 2% of the time. When the system is in operation, the HPSI header can operate and is designed to operate well above the pressure at which the HPS will maintain it. Though becoming a high energy line means that HELB consequences must now be considered (see item 4 below) there is no increase in a likelihood of a line break other than in the non-seismic portion of the tubing. This portion of the tubing is not itself important to

safety. As discussed in item 4 below, a break in this portion of the tubing (rooms 2054, 2055 and 2084 only) will also not increase the likelihood of occurrence of a malfunction of a structure system or component important to safety that may be in the vicinity.

The discharge pressure capability of the pressurization pump is well below that of the HPSI pumps. Therefore, operation of the pressurization pump cannot jeopardize the integrity of the HPSI header pressure boundary.

The location of the HPS equipment has been selected such that necessary operator access to equipment important to safety is not impeded.

By reducing the chance of gas formation in the HPSI system without frequent system venting operations, the likelihood of HPSI system malfunction is slightly reduced.

The area in which the new equipment is located has been shown to be able to accommodate water flows that might occur due to pipe breaks and pressurization pump operation or gravity drain without creating flooding problems that would jeopardize the operability of equipment important to safety.

All wetted materials will be stainless steel or elastomers acceptable for use with borated water. No corrosion products will be generated.

The temporary pump discharge tubing has an ID of approximately 0.25". This will not allow the check valve ball to leave the pump should it fail. The ball check spring is designed for the conditions that will be seen and any debris from failure that can pass through the tubing should be small enough such that a failure of HPSI/SIT components will not occur.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:
The previous ECCS recirculation fluid series boundary globe valves (2SI-1056B and 2SI-1057B) will be open instead of closed and will be replaced by ½" series check valves and ⅜" series globe valves. Engineering Report 97-R-2002-01 calculates the doses from leakage of ECCS recirculation fluid. Assumed leakage through the existing boundary at this location is based on 1" diameter. The assumed leakage is linear with repect to diameter based on 2.25 cc/hr/in. The new boundary will have two leakage paths, one with ½" diameter, the other with ⅜" diameter. The previous ECCS recirculation fluid series boundary valves become process valves in the leakage calculation and packing leaks from them must be considered at one drop/min/valve. One drop/min equals 3 cc/hr. Therefore, the leakage assumed from this point in the HPSI system changes from the current 2.25 cc/hr to 7.97 cc/hr, an increase of 5.72 cc/hr. Adding this increase to the calculated total of 2044 cc/hr (97-R-2002-01) results in a sum that is still less than the 2060 cc/min assumed in the LOCA dose analysis for the exclusion area boundary, the low population zone and the control room (ANO-2 SAR §15.1.13.4.1).

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:
The consequences of the malfunction of the new HPSI header pressure boundary valves is the

same as those of other such HPSI header pressure boundary valves. The RWT sample line valves that are now closed will be open, creating the possibility of a malfunction in their ability to close that previously did not exist. However, the administratively controlled excess RWT level eliminates any consequences of a malfunction in their ability to close. Similarly, the consequence of a malfunction in the HPSI header interface valves that are now open instead of closed is eliminated by the the new valves (check valves and test loop valves) in the extended HPSI header pressure boundary.

The consequences of the new HELB are no greater than for HELBs currently considered. From NES-13 and Calc-84-EQ-0001-01, the limiting HELB events for the areas of interest (Rooms 2007, 2009, 2055, 2054 and 2084) is the steam generator blow down line break (SGBD) or the Main Feedwater line break (MFW). The MFW HELB bounds the results from a SGBD for rooms 2007 and 2009. Therefore, only the SGBD event will be discussed. ANO-2 SAR §3.6.4 describes the dynamic analyses of high energy line breaks. The results of those evaluations are affected by input assumptions regarding the enthalpy and pressure of the fluids in the piping in which the breaks are postulated. For the SGBD event, the initial pressure and enthalpy are 885 psig and 535 Btu/lb, respectively. The HPSI header and supply tubing will be pressurized to 635 psig. At saturated liquid conditions, the enthalpy will be 481 Btu/lb. The saturation temperature at this pressure is 495F and since the fluid is from the RWT, the temperature of this fluid will not approach these conditions. Therefore, both the pressure and enthalpy of the fluid in the header and tubing is bound by the initial conditions of the SGBD event. The temperature in these rooms following a SGBD or MFW break is higher than the temperature of the water from the RWT and all rooms reach 100% humidity. Therefore, a HELB of the tubing or the HPSI discharge header would be less severe than the current limiting event. Spray effects from the HPSI header or the HPS could only potentially affect the pumps in the HPSI train in which that header is located and that train of the LPSI and Containment Spray systems. Neither the HPSI nor the Containment Spray systems are necessary to achieve cold shutdown. Although the LPSI system is necessary to achieve cold shutdown, a break in the HPSI header would not result in protective action. Therefore, a loss of redundancy in the LPSI system from such a break is permissible. Spray from the HPSI header or HPS could also impinge on valves in both trains of the shutdown cooling system. These valves can be manually operated after termination of any spray from these lines in order to achieve cold shutdown.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The new HPS has no potential to initiate an accident of any kind, previously evaluated or not. See the response to question 1.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS

Draining of the RWT inventory to an inventory sink other than the RCS would be considered to be a malfunction of the RWT that would have a different result than any previously evaluated in the SAR since the RWT has no backup and is not assumed to fail in any existing evaluation. However, the administratively controlled excess in the RWT level (with the HPS system aligned) assures that any such draining (due to the sample line valves now being open to a non seismic flow path) will not lead to less inventory available for safety injection and containment spray than currently credited in the safety analysis. Changes to the RWT level alarm response procedure assure that a leak in the HPS system would not only be isolated before the TS level limit is reached but while adequate excess is still available to offset any wastage through the HPS that might occur during a LOCA. In the event of a leak in the HPS

system, operations would have 10.9 hours to respond to the RWT Low Level alarm at 95% level before the second alarm occurs at 92%. Therefore, there is no different result than any previously evaluated in the SAR.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

   BASIS:

   This change cannot prevent the HPSI system from providing its design basis protection for the fuel cladding. This change has no affect on the design basis limits themselves for any fission product barrier.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

   BASIS:

   No change in any methods of evaluation described in the SAR is involved with this change.

ANO 50.59 Evaluation Number

2004-020

I. OVERVIEW / SIGNATURES

Facility: ANO - Unit 2

Document Reviewed: ER-ANO-2004-0172-000 **Change/Rev.:** 0

System Designator(s)/Description: Spent Fuel Handling Machine (2H-3)

Description of Proposed Change

The U-2 SAR Section 9.1.4.2.9 describes a syncro position indication for the Spent Fuel Handling Machine. Although a synchro indication system was originally installed, it did not perform the intended design function adequately so it is no longer used. This Section will be changed to state that both bridge and trolley position indications are provided by the pointer and target systems. Section 9.1.4.2.9 also describes a braking system for the bridge and trolley. The U-2 Spent Fuel Handling Machine does not have brakes on the bridge or trolley. This section will be corrected to delete reference to a braking system. Although no physical change is associated with this activity, it must be addressed from a 50.59 perspective as if the activity is removing the spent fuel machine bridge and trolley brakes.

If the proposed activity, in its entirety, involves any one of the criteria below, check the appropriate box, provide a justification/basis in the Description above, and forward to a Reviewer. No further 50.59 Review is required. If none of the criteria is applicable, continue with the 50.59 Review.

☐ The proposed activity is editorial/typographical as defined in Section 5.2.2.1.

☐ The proposed activity represents an "FSAR-only" change as allowed in Section 5.2.2.2_____. (Insert item # from Section 5.2.2.2).

If further 50.59 Review is required, check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	SCREENING	Sections I, II, III, and IV required
☐	50.59 EVALUATION EXEMPTION	Sections I, II, III, IV, and V required
☒	50.59 EVALUATION (#: 04-020)	Sections I, II, III, IV, and VI required

Preparer: Marlin D. Shehorn /EOI/System Eng./6-4-2004
Name (print) / Signature / Company / Department / Date

Reviewer: Saif U. Khan /EOI/Design Eng./6-6-2004
Name (print) / Signature / Company / Department / Date

OSRC Timothy G. Mitchell 7/1/04
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings (see Section 5.9) and 50.59 Evaluations.]

List of Assisting/Contributing Personnel:

Name: **Scope of Assistance:**

II. SCREENING

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113 (Reference 2.2.13). (See Section 5.1.13 for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # and/or SECTIONS IMPACTED
FSAR	☒	☐	U-2 SAR, Section 9.1.4.2.9
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Reports[1]	☐	☒	
If "YES", perform an Exemption Review per Section V OR perform a 50.59 Evaluation per Section VI AND initiate an LBD change in accordance with NMM LI-113 (Reference 2.2.13).			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2]	☐	☒	
Fire Protection Program[3] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculation Manual[3]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM LI-113 (Reference 2.2.13).			

2. Does the proposed activity involve a test or experiment not described in the FSAR? ☐ Yes ☒ No
If "yes," perform an Exemption Review per Section V OR perform a 50.59 Evaluation per Section VI.

3. Does the proposed activity potentially impact equipment, procedures, or facilities utilized for storing spent fuel at an Independent Spent Fuel Storage Installation? ☒ Yes ☐ No ☐ N/A
(Check "N/A" if dry fuel storage is not applicable to the facility.)
If "yes," perform a 72.48 Review in accordance with NMM Procedure LI-112.
(See Sections 1.5 and 5.3.1.5 of the EOI 10CFR50.59 Review Program Guidelines.)

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[1] If "YES," see Section 5.1.4. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Evaluation.
[3] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition.

B. Basis

Provide a clear, concise basis for the answers given in the applicable sections above. Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis. See EOI 50.59 Guidelines Section 5.6.6 for guidance.)

The proposed activity is a change to the U-2 SAR which was requested by SDID 2-97-0622. This change will correct section 9.1.4.2.9 to more accurately describe the Spent Fuel Handling Machine. This change will ensure that the method for the spent fuel bridge and trolley position indication is correctly described and will delete the inaccurate reference to brakes on the bridge and trolley, which do not exist. Except as indicated for this section of the U-2 SAR, this change will not invalidate any information that is presented in any other license base documents.

This activity will only change the description of the Spent Fuel Handling Machine. No test or experiment is involved. No change to an existing test or experiment will be required as a result of the proposed activity.

The Spent Fuel Handling Machine is used for moving spent fuel to support the dry fuel activities. Although the proposed activity will make a change to the description of this equipment, no modification or change to the equipment or operation of that equipment is proposed.

C. References

Discuss the methodology for performing the LBD search. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.3.6.4 of LI-101. **NOTE: Ensure that electronic and manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
LRS 50.59 - Unit 2	spent fuel w/10 bridge; bridge w/20 brake*; trolley w/20 brake*; bridge w/10 position; trolley w/10 position; ; synchros; spent fuel w/10 machine; "fuel handling bridge"

LBDs/Documents reviewed manually:

U-2 SAR, Sections 9 and 15

D. **Is the validity of this Review dependent on any other change?** (See Section 5.3.4 of the EOI 10CFR50.59 Program Review Guidelines)

☐ Yes
☒ No

If "Yes," list the required changes.

III. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in an air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

IV. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

A. Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

The Security Department answers the following questions if one of the questions was answered "yes".

B. Is the Security Plan actually impacted by the proposed activity? ☐ Yes ☐ No

C. Is a change to the Security Plan required? ☐ Yes Change # (optional) ☐ No

Name of Security Plan reviewer (print) / Signature / Date

V. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A, above.

A. Check the applicable boxes below. If any of the boxes are checked, a 50.59 Evaluation is not required. If none of the boxes are checked, perform a 50.59 Evaluation in accordance with Section VI. Provide supporting documentation or references as appropriate.

☐ The proposed activity meets all of the following criteria regarding design function per Section 5.6.1.1:

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; AND

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; AND

The proposed activity does not adversely affect a method of evaluation that demonstrates intended design function(s) of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed activity already exists per Section 5.6.1.2. Reference 50.59 Evaluation # _____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

☐ The NRC has approved the proposed activity or portions thereof per Section 5.6.1.3. Reference: _____

☐ The proposed activity is controlled by another regulation per Section 5.6.1.4.

B. Basis

Provide a clear, concise basis for determining the proposed activity may be exempted such that a third-party reviewer can reach the same conclusions. See Section 5.6.6 of the EOI 10CFR50.59 Review Program Guidelines for guidance.

VI. 50.59 EVALUATION

A. <u>Executive Summary</u> (Serves as input to NRC summary report. Limit to one page or less. Send an electronic copy to the site licensing department after OSRC approval, if available.)

Brief description of change, test, or experiment:

Per LI-101 this Section is not applicable to ANO and therefore does not require completion.

Reason for proposed Change:

Per LI-101 this Section is not applicable to ANO and therefore does not require completion.

50.59 Evaluation summary and conclusions

Per LI-101 this Section is not applicable to ANO and therefore does not require completion.

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B. **License Amendment Determination**

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below.

☐ Yes
☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

Two accidents were identified which could possibly be affected by the proposed activity.

1. INADVERTENT LOADING OF A FUEL ASSEMBLY INTO THE IMPROPER POSITION

One identified cause for this accident must be considered (erroneous placement or orientation of fuel assemblies). The pointer and target systems used for both Unit 1 and Unit 2 Spent Fuel Handling Machines have proven to be accurate and reliable systems. The pointer and target system is already used for the trolley as described in the SAR, so the use of the same type system for the bridge will not change the accuracy of bridge / trolley positioning. The use of the synchro system as described in the SAR would be less reliable, due to its increased complexity; therefore the installed pointer and target system is preferred. The occurrence of the identified accident will not be increased by use of the pointer and target system. A braking system for the Spent Fuel Handling Machine is not credited with preventing this type of accident. The described function of the brakes for this system is to maintain position once achieved. A braking system would not affect that final positioning, and the position, once achieved, is adequately maintained by the weight of the system, friction, inertia and the mechanical resistance of the drive system. The lack of brakes on the Spent Fuel Handling Machine will not cause the described accident to occur more frequently.

2. FUEL HANDLING ACCIDENT.

This accident includes a dropped fuel assembly or one which is damaged during handling. The identification of causes for this accident does not identify any scenario which would be affected by spent fuel position indication or lack of brakes, therefore no increase in the frequency of occurrence of this accident is possible as a result of the proposed activity. The consequences of an assumed inaccurate position indication do not include either dropping or damaging a fuel bundle. Although no brakes are provided for the Spent Fuel Handling Machine, the described function of the brakes is adequately provided by the physical properties of the machine and drive system as previously discussed. A braking system was not included in the original design of the system and is not credited with prevention of this type of accident.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

The Spent Fuel Handling Machine is considered to be an important to safety SSC which is associated with the two identified accidents described in response to Question 1, above. The system was designed to meet the requirements of Regulatory Guides 1.13 and 1.29. The proposed activity will have no impact on the original design specifications, The pointer and target system is considered to be more reliable than a synchro type indicator, therefore the use of the pointer and targer system will not make a malfunction more likely. The lack of brakes on the Spent Fuel Handling Machine has no impact on system operation, as evidenced by several years of successful experience with this machine. The braking action as described in the SAR is adequately performed by the inherent friction and inertia of the machine combined with the resistance to movement from the drive system. The lack of brakes will not cause the likelihood of a malfunction of any portion of the Spent Fuel Handling Machine to increase. The structural evaluation (including seismic qualification by analysis) of the machine, CALC-87-D-2054-03, is not affected by the lack of brakes.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

Two accidents were identified which could possibly be affected by the proposed activity.

1. INADVERTENT LOADING OF A FUEL ASSEMBLY INTO THE IMPROPER POSITION
2. FUEL HANDLING ACCIDENT

Neither the Spent Fuel Handling Machine brakes nor position indication are credited with mitigating the consequences of these accidents. The proposed activity will not affect the consequences of these or any other accident described in the SAR and will not cause an increase in radiation dose as a result of any accident analyzed in the SAR.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The proposed activity involves the position indication for the Spent Fuel Handling Machine and the lack of brakes on the bridge and trolley. These features do not perform any safety functions and will not negatively impact any component or system which does perform a safety function.The proposed activity will have no impact (directly or indirectly) on the consequences of a malfunction of a SSC important to safety. There will be no radiological impact as a result of the proposed activity.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The accidents most closely associated with the proposed activity are: 1. INADVERTENT LOADING OF A FUEL ASSEMBLY INTO THE IMPROPER POSITION and 2. FUEL HANDLING ACCIDENT. The pointer and target system is considered to be as good as or better than the installed synchro type system. The use of the pointer and target system will have no impact on system operation and will not affect any other components. The function of holding the bridge and trolley in place is performed by the inherent friction and inertia of the machine combined with resistance to movement from the drive system as previously discussed. The possibility of damaging a fuel bundle as a result of a seismic accident with a fuel bundle partially withdrawn was considered (because the bridge and trolley do not have the described braking system to hold it in place). It is possible that some damage could occur if a significant seismic event caused the bridge or trolley to move enough to force the fuel bundle horizontally into its storage rack. Any such damage would be minimal with any credible seismic event, since the fuel bundle is essentially held by a wire rope assembly while suspended. This permits significant movement of the bridge and trolley before substantially stressing the fuel assembly. However, if some damage did occur as a result of this type event, it would be within that allowed for the analyzed fuel handling accident described in the SAR, therefore this type accident has already been evaluated.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS

As previously discussed, bridge position is adequately provided by a pointer and target system similar to to that used for the trolley, and braking action for the bridge and trolley is provided by system inertia and the drive system mechanical resistance. The operation of the system remains the same and is not impacted in any way. The structural evaluation (including seismic qualification by analysis) of the fuel handling machine, CALC-87-D-2054-03, is not affected by the lack of brakes. No other components or systems are affected, therefore the proposed activity will not change the failure modes of any SSC.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

The fuel cladding is the only fission product barrier which could possibly be affected by the spent fuel machine. The proposed activity will not cause any limits associated with this barrier or any other to be exceeded or altered. As previously stated, the position indication used for the bridge is at least as good as that described in the SAR and the braking function is adequately performed by the weight of the machine, inertia and mechanical resistance to movement provided by the drive system. The Spent Fuel Handling Machine was designed to protect the fuel assemblies during movement, and this design will not be compromised or degraded by the proposed activity.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

The bridge position indication and the Spent Fuel Handling Machine brakes are not included in any evaluation or method of evaluation described in the FSAR. Therefore this activity will not result in any departure from a method of evaluation described in the FSAR.

ANO 50.59 Evaluation Number

2004-022

I. OVERVIEW / SIGNATURES

Facility: ANO - Unit 2

Document Reviewed: ER-ANO-2000-2768-002 **Change/Rev.:** 0

System Designator(s)/Description: ABHV, EDG

Description of Proposed Change

Condition Report CR-ANO-C 2000-00129 identified that for an Appendix R fire in the Unit 2 Control Room or Cable Spreading Room, any one or all of the Emergency Diesel Generators (EDG) Exhaust Fan (2VEF-24A, B, C or D) control circuits could be disabled such that fans would not operate. The loss of the EDG room exhaust fans could cause an EDG room temperature in excess of the 120° F design value, thereby causing the loss of the EDG. This condition could result in the loss of one or both of the Unit 2 EDGs, causing the loss of all credited AC power.

This ER is installing five fuses in the control circuit of each EDG room Exhaust fan to provide circuit isolation for those conductors which could be adversely affected by a fire in the Control Room or the Cable Spreading Room. In addition, one fuse which was located on the secondary side of the Control Power Transformer (CPT) is relocated to the primary side of the CPT. These fuses will be seismically mounted in the respective Exhaust Fan MCC cubicles.

This ER is also rewiring the control circuitry such that the Exhaust Fans now will automatically start on temperature regardless of whether the EDG is running or not. The EDG running interlock and the circuitry which provided the ability to stop the fan from the Control Room will be removed. This will provide further isolation of the control circuitry against the adverse affects of fire induced cable damage. The remote (Control Room) handswitch start function will be retained, but this control function is in parallel with the room temperature controller and is isolated by fuses. The existing three-position handswitches in the Control Room will be replaced with new two-position handswitches since the ability to stop the Exhaust Fan from the Control Room is no longer available. The new handswitch indicates "AUTO" and "START".

Since the existing temperature control setpoints were based on having an Exhaust Fan that would not operate unless the EDG was running, the setpoints will be changed to retain the ability to maintain the temperature of the EDG room within its design value where the EDG is running or not. The new setpoints are as follows:

2VEF-24A (2K4A) and 2VEF-24C (2K4B) are to start at 105°F and to reset at less than 100°F.

2VEF-24B (2K4A) and 2VEF-24D (2K4B) are to start at 110°F and to reset at less than 105°F.

This 50.59 evaluation has been prepared to address the impact of this change, including Post Modification and Functional Testing.

Unit 2 SAR Chapter 9 Section 9.4.2.4 and Figures 8.3-52 and 9.4-1 will be revised to indicate these changes.

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	**EDITORIAL CHANGE of a Licensing Basis Document**	**Section I**
☐	**SCREENING**	**Sections I and II required**
☐	**50.59 EVALUATION EXEMPTION**	**Sections I, II, and III required**
☒	**50.59 EVALUATION (#: FFN04-022)**	**Sections I, II, and IV required**

Preparer: Steve Brown / Steve Brown / DP Engineering / Design Engineering / 10/18/04
Name (print) / Signature / Company / Department / Date

Reviewer: David Robinson David Robinson / DP Engineering / Design Engineering / 10/18/04

Name (print) / Signature / Company / Department / Date

OSRC: J. N. Miller, Jr. [signature] 10/21/04

Chairman's Name (print) / Signature / Date

[Required only for Programmatic Exclusion Screenings (see Section 5.8) and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	☒	☐	U-2 SAR, Chapter 9, Section 9.4.2.4 "Emergency Diesel Generator Rooms", Figures 8.3-52 and 9.4-1
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	☒	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	☒	
If "YES", perform an Exemption Review per Section III OR perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. AND initiate an LBD change in accordance with NMM LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2, 3]	☐	☒	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	☒	

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

Offsite Dose Calculations Manual[3, 4]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM LI-113. No further 50.59 review is required.			

2. Does the proposed activity involve a test or experiment not described in the FSAR? ☐ Yes ☒ No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. Basis

Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Discuss other LBDs if impacted. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis. See EOI 50.59 Guidelines Section 5.3.2 for guidance.

OL / TS considerations

The control circuit wiring for the U-2 EDG Exhaust Fans is not addressed in the Operating License / Tech Specs or NRC Orders, therefore, these documents are not impacted by this proposed change.

LBD considerations

The EDG Exhaust Fans are discussed in the Unit 2 SAR. Chapter 9, Section 9.4.2.4 will be revised to remove the statement that the exhaust fans in the EDG rooms are interlocked with the diesel generators so that the fans start and the outside air dampers open at any time the diesel generators are operating and the room air temperature is above the setpoint of the temperature controllers. This Section will now state that the exhaust fans start and the outside air dampers open any time the EDG room air temperature is above the setpoint. SAR Figures 8.3-52 and 9.4-1 will also be revised to eliminate the EDG running interlock for fan operation. The design function of the EDG Exhaust Fans is not being changed. This change will actually enhance the ability of the EDG Exhaust Fans to maintain the EDG room temperature under the high temperature design value by eliminating the possibility of an Appendix R fire in the Control Room or Cable Spreading Room from causing a failure of the EDG Exhaust Fans to operate.

The changes made to the EDG Exhaust Fans by this ER are below the level of detail discussed in any of the other LBDs.

Tests or Experiments considerations

Standard post modification electrical tests, which are in previously approved procedures, will be performed by this modification and these tests do not involve a new test or experiment not described in the FSAR.

4. References

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.4.1[5]](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
Autonomy 50.59 Unit 2	"emergency diesel generator" NEAR10 "interlock*", "EDG" NEAR10 "interlock*", "dg" NEAR10 "interlock*", "interlock*", "edg", "exhaust", "emergency diesel generator", "2vef", "stop", "room cooling", isolation, diesel NEAR8 failure, "fast transfer", "slow transfer"

LBDs/Documents reviewed manually:

Unit 2 SAR
- 8.3.1.1.7 thru 8.3.1.1.9
- 8.3.1.2.5.5
- 8.3.1.6
- Table 8.3-1
- Figure 8.3-52
- 9.4.2.4
- 9.5.9
- Table 9.4-2
- Figure 9.4-1

Tech Spec 3/4.8.1, 3/4.8.2, Table 3.3-4

5. **Is the validity of this Review dependent on any other change?** (See Section 5.3.4 of the EOI 10 CFR 50.59 Program Review Guidelines.)

☐ Yes
☒ No

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	☒	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	☒	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	☒	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	☒	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	☒	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	☒	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	☒	Involve a change to the Fuel Building electrical power?
9.	☐	☒	Involve a change to the Fuel Building ventilation?
10.	☐	☒	Involve a change to the ISFSI security?
11.	☐	☒	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	☒	Involve a change to spent fuel characteristics?
13.	☐	☒	Redefine/change heavy load pathways?
14.	☐	☒	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	☒	Involve a change to the loading bay or supporting components?
16.	☐	☒	New structures near the ISFSI?
17.	☐	☒	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	☒	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes ☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

A review of Chapter 15 found no previously analyzed accidents that may be caused by this modification. This modification revises the control circuitry of the EDG room Exhaust fans to correct a vulnerability of the fans to an Appendix R fire in either the Control Room or the Cable Spreading Room. Although the EDG room Exhaust Fans are not initiators of any accidents in Chapter 15 of the SAR, the EDGs themselves are credited for supplying backup power to the ESF busses for a number of accidents analyzed in Chapter 15 of the SAR. These include:

15.1.9 Loss of All Normal and Preferred AC Power to the Station Auxiliaries

15.1.14 Major Secondary System Pipe Breaks With or Without a Concurrent Loss of AC Power (15.1.14.1 Steam Line Break Accident)

15.1.18 Steam Generator Tube Rupture With or Without a Concurrent Loss of AC Power

15.1.30 Loss of Service Water System

The EDGs are counted on to provide backup AC power to ESF busses for these accidents. They are not initiators.

In addition, fast transfer from the Unit Auxiliary Transformer (UAT) to the Startup transformer is discussed in 15.1.5, Total and Partial Loss of Reactor Coolant Forced Flow. Since this modification will revise the fan control logic so that the fans can now be running when the EDGs are not in service, this modification will add electrical load to the Fast Transfer analysis. Although discussed, fast transfer is not credited for supplying the RCPs and other equipment in this accident. Again, the Startup transformer and components associated with fast transfer are not initiators for this accident.

This modification will change the way that the EDG exhaust fans are controlled and operated, however, this change cannot affect an accident initiator of any previously analyzed accidents.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The EDGs function to provide power to the ESF busses during a loss of the offsite power source and during a degraded voltage condition. Two EDG room Exhaust Fans function to ventilate each of the EDG rooms, removing heat and drawing fresh air into the rooms. Per FSAR section 9.4.2.4, only one fan is required to be operational for each room. A loss of both exhaust fans for the same EDG can result in room temperatures exceeding 120° F and the resultant loss of an EDG. This change has been thoroughly evaluated to ensure that there are no common mode failures introduced that could result in loss of both Exhaust fans.

A Failure Modes and Effects Analysis was conducted to evaluate the failure modes for the revised circuit with the new fuses. This analysis concluded that the addition of these fuses will serve to isolate the MCC wiring in the event of a postulated hot short condition caused by a Control Room or Cable Spreading

Room fire, thus preserving the operability of the EDG Room Exhaust Fans.

The new fuses, fuse blocks, and handswitches will be seismically installed in MCC cubicles and the Control Room. Analysis has shown that the new fuses and handswitches will not adversely impact the seismic qualification of the MCCs, the Control Room panels, or any other components.

Since this modification will revise the control logic, the fans will now run anytime the room ambient is above the temperature controller setpoint, regardless of whether the EDG is running or not. Thus, the fans can now be running during a number of analyzed conditions which were not previously considered (e.g., loss of offsite power, degraded grid voltage, fast transfer, etc.). The ER evaluated each of these cases in detail and determined that there was no negative impact on the AC distribution system and its components associated with this change.

Prior to the modification provided by this ER, there was no capability to automatically start the fans without the Emergency Diesel Generator running. New setpoints have been established to minimize cycling of the fans during normal operations in the summer months, and are below the expected accident room temperature and room temperature design limits of 120°F. The new setpoints retain the ability to maintain the temperature of the EDG room, with one exhaust fan running, at 115°F Dry Bulb (DB) with an outside temperature of 95°F or 120°F with an outside temperature of 100°F (reference SAR Section 9.4.2.4).

One advantage of this modification is that the fans will now operate at all times to maintain the room temperature below the setpoint of the temperature controllers. Previously, there was no room cooling unless the EDGs were running. The new installation will serve to limit room ambient temperature excursions to the new temperature controller setpoints.

Therefore, this change will not result in an increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR, and will, in fact, prevent the malfunction of an EDG room Exhaust fan due to a damage to control cables from a fire in the Cable Spreading Room or Control Room.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

This modification involves a change in the operation of the EDG room Exhaust fans and a change in the temperature setpoints for the temperature controllers for these fans. The function of the EDG room Exhaust Fans is not degraded by these changes, rather the operational and setpoint changes will help maintain the EDG room temperatures below the maximum temperature rating of components in these rooms whether the EDG is running or not. Specifically, the design of this modification eliminates the possibility of loss of the EDG room Exhaust Fans (with the possibility of loss of an EDG) due to a fire in either the Control Room or the Cable Spreading Room.

There are no accidents discussed in the SAR which, if combined with this modification, could result in any increase in radiological dose consequences.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

This change will not impact the consequences of a malfunction of an SSC. Components associated with this modification are the EDG Room Exhaust Fans, the Temperature Controllers, and the EDGs themselves. Failure of an EDG is postulated and has been previously evaluated. Failure of one exhaust fan will not impact the EDG, but failure of a second fan for the same EDG could result in loss of that EDG. Again, loss of one EDG has been previously evaluated.

The existing design provides for control of the exhaust fans by the temperature controllers when the EDGs are running. The new design will remove the permissive of the EDG running, but will retain control of the fans by the temperature controllers. As in the existing design, the fans can be manually started from either the Control Room or the MCC. In either instance, a failure of the temperature controller to respond to an increase in room temperature will result in a failure of the fan to run. This is not changed from the existing

analyzed condition.

If the temperature controller were to fail to reset after the room temperature had been lowered to the reset setpoint, the exhaust fans would continue to run indefinitely. Although this will not threaten the availability of the EDGs, it will result in a needless loss of heat in the EDG rooms. If the temperature were to drop drastically (i.e., the failure occurred in winter), there is presently annunciation of the Diesel lube oil temperature which will provide Operations adequate indication in conjunction with the indication provided by the handswitch lamps. This indication is adequate to allow Operation to stop the fan locally. There are nonsafety-related electric heaters in the EDG rooms, however they cannot be counted on to maintain room temperature while the exhaust fans are running.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The worst case result of any postulated failure of components associated with this modification is a loss of one EDG. This failure has been previously evaluated.

There are no common mode failures that can impact both trains and result in a failure of both EDGs.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

Components associated with this modification are the EDG Room Exhaust Fans, the Temperature Controllers, and the EDGs themselves. Failure or malfunction of one temperature controller or exhaust fan will have no impact, but failure of a second fan for the same EDG could result in loss of that EDG. Failure of one EDG is postulated and has been previously evaluated.

By improving the temperature control for the EDG rooms and removing a vulnerability in the control circuit for an Appendix R fire, the reliability of the EDGs is increased. There are no possible malfunctions of SSCs which could have a different result other than a failure of an EDG.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

Affected design basis limits for fission product barriers are not impacted by this modification. This change cannot affect fuel cladding, RCS boundaries, nor containment pressure.

The EDGs are credited for supplying backup power to the ESF busses in the event of loss of power from the normal sources. The availability and reliability of these EDGs is not negatively impacted by this modification, but the reliability is increased due to better temperature control in the rooms and ensuring availability during an Appendix R fire.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

The design bases of the EDG Exhaust Fans (2VEF-24A, B, C, D) per U-2 SAR Section 9.4.2.4 is: "In case one exhaust fan in either room fails the second fan will maintain the room at 115 °F DB (dry bulb) with an outside air temperature of 95°F or 120°F with an outside air temperature of 100°F."
This change will not impact the design basis of these fans nor the EDGs.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ANO 50.59 Evaluation Number

2004-023

I. OVERVIEW / SIGNATURES

Facility: ANO-Unit 2

Document Reviewed: ER-ANO-2004-0786-000; 2FSAR

Change/Rev.: 0
Amendment 18

System Designator(s)/Description: FP (Fuel Pool)

Description of Proposed Change

The proposed change is to revise 2FSAR Table 9.1-5 to remove reference to transfer tube outside valve 2CV-5432 as having any containment isolation function. Other changes strengthen 2FSAR wording regarding the transfer tube blind flange in 2FSAR sections that discuss the use of double resilient seals for the equipment, personnel and escape hatches. The 2FSAR section that has the 10CFR50 Appendix A General Design Criteria (GDC) requirements and responses is also revised. The responses to GDCs 53 and 56 are changed to discuss that double seals are also used to meet criteria requirements (GDC 53) and that using double seals meets the requirements on an "other defined basis" (GDC 56) for the equipment, personnel and escape hatches as well as the transfer tube blind flange.

2CV-5432 is a 36 inch normally closed, manually operated gate valve that is opened during refueling operations to allow fuel to be transferred via the transfer tube.

The configuration around the transfer tube when ANO-2 (and ANO-1) initially went into commercial operation required that 2CV-5432, located on the spent fuel pool end of the transfer tube, be an outside of containment isolation valve. 2CV-5432 was an outside containment isolation valve because the transfer tube had a drain line that was connected to the containment sump (i.e., in direct contact with containment atmosphere) and the valve near the transfer tube for isolating the drain was the inside containment isolation valve. Therefore the drain valve / 2CV-5432 configuration met the requirements of 10CFR50 Appendix A General Design Criteria (GDC) 56. Initially, the transfer tube drain valve was not recognized as being a containment isolation barrier and 2FSAR Table 9.1-5, "Single Failure Mode Analysis of the Fuel Handling Equipment", incorrectly showed and still shows 2CV-5432 as being the second isolation barrier to the blind isolating flange on the containment side of the transfer tube.

When (circa 1986) the drain valve was determined to be a containment isolation valve, a 10CFR50 Appendix J local leak rate test of it and 2CV-5432 would have had to be performed. Rather than Appendix J test the two valves periodically (due to the concern that the 36" 2CV-5432 would often not pass the periodic testing criteria), engineering and operations agreed to remove the drain valve and weld a cap on the transfer tube drain line stub-out. The capped drain line is still the current configuration. In conjunction with removing the drain valve and capping the line, 2CV-5432 was no longer a containment isolation valve and it remained untested as a containment barrier.

However, 2FSAR is currently ambiguous regarding whether or not 2CV-5432 is a containment isolation valve. CR-ANO-2-2004-01630 notes this ambiguity about containment isolation of the transfer tube: 2FSAR Table 6.2-26, "Containment Isolation Barriers", shows penetration 2C3 as a containment isolation provided by a blind flange only, whereas Table 9.1-5 for the same penetration states that if 2CV-5432 fails to close, the valve "must be repaired for containment isolation."

ER-ANO-2-2004-0786-000 demonstrates why the Table 9.1-5 is a hold-over from a configuration no longer present in ANO-2. The ER justifies a corrected design and licensing bases for containment isolation achieved for the fuel transfer tube by use of the isolating blind only. The ER demonstrates that due to its double resilient seal configuration the isolating blind fully meets the requirements of GDC 56 on an "other defined basis" without need for a second outside containment isolation barrier such as 2CV-5432. In achieving isolation by means of double seals or gaskets, the transfer tube is identical in function with the equipment, personnel and escape hatches.

Scope of the 50.59 Review

2FSAR is very clear regarding how double resilient seals provide redundant containment isolation meeting the requirements of GDC 56; however it is not as clear how the double seals of the transfer tube blind flange also meets the same GDC. As stated above, Table 9.1-5 implies that 2CV-5432 is a containment isolation valve. 2FSAR was searched for statements regarding the transfer tube blind flange being an acceptable containment isolation barrier by itself. The ER provides several places for improved, clearer language.

The 2FSAR was also searched for clear descriptions of 2CV-5432's design and licensing bases. These are found as follows:

1. During refueling, the valve is maintained closed after the transfer tube isolating flange is removed until the flooded level in containment has the same elevation as the water in the spent fuel pool, then it is opened (section 9.1.4.3.2, 5th paragraph), and

2. The valve and the transfer tube must be large enough to allow adequate natural circulation cooling of any fuel bundles that might be stuck in the transfer tube should there be a transfer tube fuel carriage malfunction (section 9.1.4.3.3.A.6).

No changes to the Appendix J testing program are required.

Exemption

The ER cites changes to 2FSAR section 3.1.5 that improve responses for GDCs 53 and 56 by stating that the double seals on the equipment, personnel and escape hatches and on the transfer tube blind flange met the requirements of these two GDCs. In Section 3.8.1.1, the wording is revised to include the transfer tube blind flange in the discussion on the double seal configuration of the equipment, personnel and escape hatches.

Evaluation

2CV-5432's component classification should have been downgraded from being a containment isolation valve when the transfer tube drain valve was removed and the line was capped. However, Engineering has been unable to find a copy of a 50.59 evaluation that justified the 2CV-5432 downgrade; therefore a 50.59 evaluation is performed for this downgrade so that Table 9.1-5 can be revised.

ANO-1 Review

ANO-1 had the same initial configuration as ANO-2, i.e. the refueling transfer tube had a drain line and drain valve. However the valve and line were removed via DCP 86-1077 and current P&ID M-235, "Spent Fuel Cooling System", sheet 1, rev.64 shows no drain line or valve. The ANO-1 valve equivalent to 2CV-5432 is SF-45, located on the spent fuel pool side of the refueling transfer tube. 1FSAR was searched for statements similar to those found in 2FSAR that state or imply that SF-45 is a containment isolation valve but none were found.

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	**EDITORIAL CHANGE of a Licensing Basis Document**	**Section I**
☐	**SCREENING**	**Sections I and II required**
☒	**50.59 EVALUATION EXEMPTION**	**Sections I, II, and III required**
☒	**50.59 EVALUATION (#: 04-023)**	**Sections I, II, and IV required**

Preparer: Roger D. Wilson/ Roger D. Wilson /DP Engineering/ANO DE-Mech/25-Oct-04
Name (print) / Signature / Company / Department / Date

Reviewer: Alexander B. McGregor/ A B McGregor /EOI/ANO DE-Mech O&M/October 25, 2004
Name (print) / Signature / Company / Department / Date

OSRC: J.R. Eichenberger / [signature] / 10/27/04
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings (see Section 5.8) and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	☒	☐	Requiring Evaluation 1. Table 9.1-5 By Exemption 1. Section 3.1.5, Conformance with NRC General Design Criteria: Response for Criterion 53. 2. Section 3.1.5, Conformance with NRC General Design Criteria: Response for Criterion 56. 3. Section 3.8.1.1. 4. Section 6.2.4.2.
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	☒	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	☒	
If "YES", perform an Exemption Review per Section III OR perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. AND initiate an LBD change in accordance with NMM LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2, 3]	☐	☒	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	☒	

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.

Offsite Dose Calculations Manual[3, 4]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM LI-113. No further 50.59 review is required.			

2. Does the proposed activity involve a test or experiment not described in the FSAR? ☐ Yes ☒ No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. Basis

Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Discuss other LBDs if impacted. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis. See EOI 50.59 Guidelines Section 5.3.2 for guidance.

LRS/ZyIndex was used to search licensing basis documents (LBDs) by using "50.59 – Unit 2" which searches all ANO-2 LBDs; the search criteria are listed below. All LRS hits were in 2FSAR only.

Operating License/Technical Specifications

The LCOs, surveillances and other controls in the Operating Licenses and Technical Specifications (OL / TSs) address maintaining containment integrity. However, the proposed 2FSAR change is below the level of detail controlled by the OL / TSs.

Tests or Experiments considerations.

The only testing applicable to these changes is testing to meet the requirements of 10CFR50 Appendix J; the 2FSAR revisions do not affect the Appendix J testing program requirements or results and do not affect any of the assumptions or given conditions upon which the program is based.

Spent Fuel Pool and Dry Fuel Storage

The 2FSAR revisions have no impact on equipment, procedures or facilities used to store spent fuel or the dry fuel storage. The current functions of 2CV-5432 as described in section 1 of this 50.59 review are unchanged.

FSAR

Table 9.1-5 is revised to delete the statement regarding 2CV-5432 requiring repair to provide containment isolation. Other wordings are revised to include the transfer tube blind flange in 2FSAR sections that discuss the use of double resilient seals for the equipment, personnel and escape hatches.

[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

4. **References**

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.4.1[5](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:

LRS 50.59 – Unit 2

Keywords:

1. "transfer tube"
2. flange w/30 "transfer tube"
3. "2CV-5432"
4. valve w/30 "transfer tube"
5. seals w/30 (resilient or compression)
6. seal w/30 hatch

LBDs/Documents reviewed manually:

1. Fig. 3.8-9
2. 2FSAR Section 6.2.4 "Containment Isolation Systems" and corresponding Section 6 tables and figures
3. 2FSAR Section 9.1.4.3.2, "Refueling Procedure" and section 9 tables and figures

5. **Is the validity of this Review dependent on any other change?** (See Section 5.3.4 of the EOI *10 CFR 50.59 Program Review Guidelines.*)

☐ Yes
☒ No

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	☒	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	☒	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	☒	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	☒	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	☒	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	☒	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	☒	Involve a change to the Fuel Building electrical power?
9.	☐	☒	Involve a change to the Fuel Building ventilation?
10.	☐	☒	Involve a change to the ISFSI security?
11.	☐	☒	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	☒	Involve a change to spent fuel characteristics?
13.	☐	☒	Redefine/change heavy load pathways?
14.	☐	☒	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	☒	Involve a change to the loading bay or supporting components?
16.	☐	☒	New structures near the ISFSI?
17.	☐	☒	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	☒	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

III. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A.1, above.

A. Check the applicable boxes below. If any of the boxes are checked, clearly document the basis in Section II.B, below. If none of the boxes are appropriate, perform a 50.59 Evaluation in accordance with Section IV. Provide supporting documentation or references as appropriate.

☒ The proposed activity meets all of the following criteria regarding design function per Section 5.5[1](a):

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of evaluation that demonstrates intended design function(s) of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed activity already exists per Section 5.5[1](b). Reference 50.59 Evaluation # _____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

☐ The NRC has approved the proposed activity or portions thereof per Section 5.5[1](c). Reference: _____

B. Basis

Provide a clear, concise basis for determining the proposed activity may be exempted such that a third-party reviewer can reach the same conclusions. See Section 5.6.6 of the EOI 10 CFR 50.59 Review Program Guidelines for guidance.

The containment isolation function of the transfer tube isolating blind flange is shown in 2FSAR Table 6.2-26. There are no textual passages in 2FSAR that state or imply that the transfer tube blind flange requires a redundant means of containment isolation such as using 2CV-5432. Conversely, there are several 2FSAR textual passages that discuss that containment integrity is achieved by means of double resilient seals on the equipment, escape and personnel hatches. The double resilient seals on the transfer tube blind flange are equivalent in form, fit and function to those on the hatches. In addition, Grand Gulf and Waterford use this exact same configuration: an isolating blind flange having double (concentric) resilient seals is the sole device for containment integrity on each unit's transfer tube.

Therefore, on an exempt basis since no functions are involved, improved 2FSAR language for the responses to GDCs 53 and 56 are added as described as well as other improved language that includes the transfer tube blind flange in discussions of the use of double seals in the equipment, personnel and escape hatches.

For those changes requiring exemption, there is no change to design function, to any method of performing or controlling a design function, or to any method of evaluation demonstrating design function. Rather, the changes clarify that the transfer tube blind flange with its redundant resilient seals is part of the category of containment penetration sealing devices which includes the equipment hatch, the personnel hatch, and the escape hatch.

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes ☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   Note: Table 9.1-5 does not cite the 2CV-5432 tag number but it is clear from the description "fuel transfer tube isolation valve" that 2CV-5432 is the intended valve.

   The accidents previously evaluated in the FSAR whose frequency could be affected by containment penetrations are those involving both fission products and pressure inside the containment, and also fuel handling. These are the LOCA and the Main Steam Line Break (MSLB), and the Fuel Handling Accident. Removal of the unnecessary requirement to repair 2CV-5432 "for containment isolation" in Table 9.1-5 cannot reasonably have any affect on the conditions which affect the occurrence of the LOCA or MSLB. The frequency of occurrence of a fuel handling accident cannot reasonably be affected by elimination of a requirement to repair 2CV-5432 "for containment isolation". There are no other accidents which can reasonably be affected by elimination of the requirement to repair 2CV-5432.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   Downgrading 2CV-5432 will have no impact on any important-to-safety (ITS) structure, system or component (SSC). Since the transfer tube drain valve has been removed and the transfer line stub-out capped, the only important-to-safety SSC of interest is the transfer tube itself and the transfer tube blind flange. Since the change is in a 2FSAR table only, there are no changes to any IST SSC in regard to material and construction requirements, seismic strength and rigidity considerations, or meeting any single failure criteria. The single failure criteria and results in Table 9.1-5 are unchanged after the wording is deleted.

   Even if 2CV-5432 has a gross failure to isolate, the result would be to fill the transfer tube with borated water from the spent fuel pool. Even this would not increase the likelihood of a failure of any ITS SSC.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   As stated above, the relevant, bounding accident affecting offsite dose is a LOCA. 2CV-5432 is not credited in any off-site dose calculation and its downgrade will have no effect on these calculations or in actual offsite doses should such accident occur. Likewise, 2CV-5432 is not involved in off-site dose calculations resulting from a fuel handling accident.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

Since adequate containment isolation is provided by the transfer tube blind flange, down grading 2CV-5432 will have no affect whatsoever on any SSC evaluated in 2FSAR as affecting off-site dose consequences. The impact on these SSCs remains unchanged by deleting the Table 9.1-5 wording.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

Even if 2CV-5432 were to fail open catastrophically, this failure would not affect an accident initiator or failure not previously analyzed which has its consequences discussed in 2FSAR. As mentioned above, the accident of interest is a LOCA or MSLB. Whether 2CV-5432 operates or fails to operate, or whether there is any amount of leakage through the valve, a different type of accident than those analyzed in 2FSAR cannot reasonably be created since no physical changes are being made to the valve itself.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

Since the changes regarding 2CV-5432 are in the 2FSAR table itself and there are no physical changes to the valve, there is no possibly of creating different failure modes to any ITS SSC that could result in offsite doses not previously analyzed and discussed in 2FSAR. The failure modes and effects results discussed in 2FSAR are unchanged, even those discussed in Table 9.1-5 for fuel storage SSCs that are important to safety.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

The 2FSAR changes in regard to 2CV-5432 in Table 9.1-5 will have no effect on fuel and fuel cladding parameters such DNBR, temperature, enthalpy, cladding strain or rates of oxidations, either during normal or accident conditions. The change will have no effect on the integrity of the reactor coolant system (RCS) because the valve is outside the containment and all of the RCS is inside the containment. The most relevant barrier, containment integrity, is unaffected by the revision because the containment boundary is defined by the transfer tube and the transfer tube blank flange and its resilient seals, and not by 2CV-5432. Uncorrected failure to close does not affect the containment boundary.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

2CV-5432's function or failure to function has a negligible effect that is much below and not considered in any methodology used for ANO-2 or discussed in 2SAR. As stated above, the valve's failure to remain closed has only a small effect on the fuel storage system, resulting only in filling the relatively small volume of the transfer tube. The failure would do that only when borated water in the spent fuel pool system is in contact with 2CV-5432's gate. Only operational concerns, not safety concerns, arise from such a failure.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ANO 50.59 Evaluation Number

2004-024

I. OVERVIEW / SIGNATURES

Facility: ANO - Unit 2

Document Reviewed: ER-ANO-2002-0875-004 **Change/Rev.:** 0

System Designator(s)/Description: Shutdown Cooling System (SDC) \Autoclosure Interlock Removal

Description of Proposed Change

Nuclear Change Package (NCP) ER-ANO-2002-0875-004 removes the Automatic Closure Interlock (ACI) associated with ANO-2 Shutdown Cooling (SDC) System and raises the RCS pressure which SDC can be manualy initiated from 275 °F and 270 psia, to 275 °F and 300 psia.

The following three items are accomplished in order to perform the change and are encompassed in the scope of review :

1) This Nuclear Change Package (NCP) modifies the control circuits associated with the Shutdown Cooling Shut Off valve (2CV-5084-1) and the Shutdown Cooling Suction Isolation valve (2CV-5086-2) to delete the ACI function.
2) Installation of a new annunciator alarm, provides indication of a double valve isolation breach at power by detecting a SDC isolation valve misposition in the Control Room. This NCP involves configuration changes to control circuits on the following components: SDC Isolation valves (2CV-5084-1 and 2CV-5086-2), 480V Motor Control Centers 2B51/2B62, and Control Room cabinets 2C16 /2C17. Configuration changes at the isolation valves include rewiring a valve limit switch to an existing spared switch rotor using existing spared field conductors for alarm logic input. Control relays will be added to Motor Control Center (MCC) 2B51 and 2B62 for power transfer and alarm logic input. The change modifies 2CV-5084-1 and 2CV-5086-2 valve position in the Control Room to provide indication when the normal valve power supplies are unavailable. a isolation relay is added to 2C16 and a handswitch will be added to 2C17 for the annunciator circuit.
3) This modification package also impacts the Open Permissive Interlock (OPI) setpoint which is changed from 300 psia to 350 psia; however the valves are to be closed when the RCS pressure is above 300 psia per FSAR Section 3.6.4.2.7.1. The new OPI setpoint will account for instrument uncertainty.

Operator Work Around (OWA) 2-00-4 describes a condition that places the ANO-2 operators in an undesirable situation during plant cooldown or heatup. According to the OWA, the allowable operating band for pressurizer pressure during the latter stages of cooldown, when transitioning from steam generator heat removal to the SDC System mode, is very restrictive. The lower limit of the operating band for pressurizer pressure is set by the required pressure/temperature (P/T) curve that protects the reactor coolant pump (RCP) net positive suction head (NPSH) and seal pressure limits to prevent pump damage. The upper limit of the pressure band is selected to be low enough such that, when instrument uncertainties and other factors such as hydraulic flow noise are considered, the SDC System can be placed into service (with one or more RCPs running) without causing the ACI to spuriously activate. The ACI closes motor operated isolation valves located in the SDC suction line from the RCS at a pressure of ~ 300 psia as stated by the ANO-2 Technical Specification 4.5.2.d.1. The purpose of the ACI is to assure the integrity of the RCS pressure boundary through a single failure proof, redundant (two valves in series) isolation valve arrangement. This interlock prevents the higher RCS pressure from over-pressurizing the lower design pressure SDC System during normal operation. The OWA states that, with RCPs running, the operating band available is too narrow. The concern is equipment damage to the RCPs if pressure is maintained too low or possible Lower Pressure Safety Injection System (LPSI) pump damage or also loss of shutdown cooling if pressure climbs high enough to actuate ACI.

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	**EDITORIAL CHANGE of a Licensing Basis Document**	**Section I**
☐	**SCREENING**	**Sections I and II required**
☐	**50.59 EVALUATION EXEMPTION**	**Sections I, II, and III required**
☒	**50.59 EVALUATION (#: FFN# 04-024)**	**Sections I, II, and IV required**

Preparer: Rickey L Turner/ / DP Engineering / EIC Design/ 10-28-04
Name (print) / Signature / Company / Department / Date / 10-28-04

Reviewer: Steve Bennett/ / EOI / Licensing 10/28/04
Name (print) / Signature / Company / Department / Date

OSRC: J.R. Eichenberger / / 10/28/04
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings (see Section 5.8) and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	☒	☐	FSAR Section 3.6.1 FSAR Section 5.6.2.3 FSAR Section 7.6.1.1.1 FSAR Figure 7.3-10 FSAR Table 7.3-5 FSAR Section 7.6.1.1.2 FSAR Section 7.6.1.3.2 FSAR Section 7.7.1.1.9 FSAR Section 9.3.6.2.1 FSAR Section 9.3.6.2.3 FSAR Section 9.3.6.3 TS 4.5.2 Bases
TS Bases	☒	☐	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	☒	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	☒	
If "YES", perform an Exemption Review per Section III <u>OR</u> perform a 50.59 Evaluation per Section IV <u>OR</u> obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. <u>AND</u> initiate an LBD change in accordance with NMM LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2, 3]	☐	☒	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculations Manual[3, 4]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation <u>AND</u> initiate an LBD change in accordance with NMM LI-113. No further 50.59 review is required.			

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

2. **Does the proposed activity involve a test or experiment not described in the FSAR?** ☐ Yes ☒ No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. Basis

Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Discuss other LBDs if impacted. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis. See EOI 50.59 Guidelines Section 5.3.2 for guidance.

Operating License/Technical Specifications

A request to amend the Operating License NPF-6 to revise the Technical Specifications (TS) to delete the Automatic Closure Interlock Surveillance Requirement 4.5.2.d.1 associated with TS 3.5.2, ECCS Subsystems –Tave ≥ 300 °F is contained within the scope of 2CAN070401 dated July 8, 2004. No other impact / changes to the OL/TS have been identified.

FSAR

The ACI and or OPI functions are discussed in Sections 3.6.1, 5.6.2.3, 7.6.1.1.1, 7.6.1.1.2, 7.6.1.3.2, 7.7.1.1.9, 9.3.6.2, 9.3.6.3 and Figure 7.3-10 (M-2418 sh 2 and M-2418 sh 4) and Table 7.3-5 of the ANO-2 FSAR and are being impacted by this change.

Section 6.3.3.11.3 discusses a valve interlock but is not prescriptive on which interlock. The OPI interlock remains applicable after this change; therefore **Section is 6.3.3.11.3 is not impacted** by this NCP.

The following sections are within the NRC review scope of 2CAN070401 under II.A.5:

Sections 5.6.2.3, 7.6.1.1.2, 7.7.1.1.9 and 9.3.6.3 discusses valve position provided by the ACI function and is revised to reflect ACI removal.

Section 7.6.1.1.1 describes valve position based on the ACI function and is revised to indicate the additional alarm in the Control Room and ACI removal. 2CAN070401 does not address the OPI setpoint change portion of this section.

Section 7.6.1.3.2 discusses the LTOP Design Basis Event and is revised to indicate the LTOP valves provide the overpressure protection for the SDC System.

Section 9.3.6.2.1, 9.3.6.2.3 provides a discussion of ACI and OPI and is revised to remove the ACI information and provide a discussion concerning the new alarm function.

FSAR Figure 7.3-10 (M-2418 sh 2 and M-2418 sh 4) provides a functional description of the shutdown cooling isolation valves and is revised to incorporate the new alarm and setpoint.

FSAR Table 7.3.5 describes the instruments ranges, setpoints and margins of the ACI and is revised to remove the information pertaining to the Low Low pressure (SDC) valves.

Technical Specification 4.5.2 Bases provides the bases for the surveillance requirements for the ACI function and is revised to remove the requirements.

A LBD change has been submitted for the above changes.

The following changes are within the scope for further 50.59 review:

FSAR Section 3.6.1 discusses the operating pressure at which the SDC is manually initiated and is revised to reflect the new closure pressure.

FSAR Section 7.6.1.1.1 discusses the OPI setpoint and is revised to indicate the new OPI setpoint of 350 psia.

FSAR Figure 7.3-10 (M-2418 sh 2 and M-2418 sh 4) provides a functional description of the shutdown cooling isolation valves and is revised to incorporate the new OPI setpoint.

Tests or Experiments Considerations

Changes to the valve limit switches, the addition of relays, addition of a handswitch, alarm and the raising of the OPI setpoint as well as the installation and testing activities do not involve test and experiments not discussed in the FSAR. Systems and functions continue to be utilized in a manner that is within the reference bounds and is consistent with analyses or descriptions in the FSAR.

4. References

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.4.1[5]](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:
Autonomy Unit 2 50.59

Keywords:

"Automatic Closure Interlock", "2CV-5084-1", 2CV-5086-2","2CV-5038-1", SDC, "shutdown cooling interlock", 300, "300 psia", 270, "270 psia", SDC NEAR50 instrument error, SDC NEAR50 error, SDC NEAR50 uncertainty, OPI, "Auto Closure Interlock", autoclosure, ACI NEAR50 setpoint, "Open Permissive Interlock", operating limit, switch NEAR50 uncertainty, RCP NEAR50 operating limit, reactor coolant pump, 4623-1, 4623-2, LTOP, 2B51G2, 2B62E5,

LBDs/Documents reviewed manually:

FSAR Sections 3.6.1, 3.6.4.2.7.1, 5.6, 7.6, Chap 15

SAR Table 7.3-5

SAR Figure 7.3-10 (M-2418, Sh 2 and M-2418 sh 4)

ANO Technical Specification 4.5.2 and Bases

5. **Is the validity of this Review dependent on any other change?** (See Section 5.3.4 of the EOI 10 CFR 50.59 Program Review Guidelines.) ☒ Yes ☐ No

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

2CAN070401 License Amendment Request, "Shutdown Cooling Automatic Closure Interlock Removal" amends the Operating License NPF-6 to revise the Technical Specifications (TS) to delete the Automatic Closure Interlock Surveillance Requirement 4.5.2.d.1 associated with TS 3.5.2, ECCS Subsystems –Tave ≥ 300 °F. The ACI/OPI functions which are discussed in Sections 5.6.2.3, 6.3.3.11.3, 7.6.1.1.2, 7.6.1.3.2 , 7.7.1.1.9, 9.3.6.2 and 9.3.6.3 of the ANO-2 FSAR are all addressed by 2CAN070401 "License Amendment Request "Shutdown Cooling Automatic Closure Interlock Removal" and is not within the scope of this review.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	☒	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	☒	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	☒	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	☒	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	☒	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	☒	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	☒	Involve a change to the Fuel Building electrical power?
9.	☐	☒	Involve a change to the Fuel Building ventilation?
10.	☐	☒	Involve a change to the ISFSI security?
11.	☐	☒	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	☒	Involve a change to spent fuel characteristics?
13.	☐	☒	Redefine/change heavy load pathways?
14.	☐	☒	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	☒	Involve a change to the loading bay or supporting components?
16.	☐	☒	New structures near the ISFSI?
17.	☐	☒	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	☒	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

III. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A.1, above.

A. Check the applicable boxes below. If any of the boxes are checked, clearly document the basis in Section II.B, below. If none of the boxes are appropriate, perform a 50.59 Evaluation in accordance with Section IV. Provide supporting documentation or references as appropriate.

☐ The proposed activity meets all of the following criteria regarding design function per Section 5.5[1](a):

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of evaluation that demonstrates intended design function(s) of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed activity already exists per Section 5.5[1](b). Reference 50.59 Evaluation # _____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

☐ The NRC has approved the proposed activity or portions thereof per Section 5.5[1](c). Reference_____

B. Basis

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes ☒ No

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   The OPI is a design feature for protection of a high to low pressure piping interface to prevent a SDC System suction isolation valve from being open unless the RCS pressure is below setpoint. OPI is not credited in any analysis, overpressure protection is credited to the LTOP valves. This setpoint has the same setpoint as the alarm.

   A review of the FSAR Chapter 15 accidents did not reveal that any of the accidents were the result of the OPI function failing to operate properly when required, operating at pressures in excess of safe system design pressure rating, or due to the operator failing to initiate shutdown cooling at a sufficiently low pressure. One of the accidents involves failure or over-pressurization of the low pressure residual heat removal system (FSAR Section 15.1.27). In this event, the FSAR only points to section 6.3 of the FSAR as this contains a description of the Low Pressure Safety Injection (LPSI) System which is used for shutdown cooling. Careful scrutiny of these sections did not reveal any stated assumption of failure of the OPI or operator error to initiate the over-pressurization event. Also, none of the accidents reviewed were initiated by a maintenance error during calibration and or testing. OPI prevents the SDC System isolation valves from opening when RCS pressure is above the design setpoint pressure. The ANO-2 SDC System design pressure is 560 psig per Engineering Report CALC A2-ME-2003-002,"Auto-Closure Interlock Setpoint Change and ACI Removal Study". NCP ANO-2002-0875-004 raises the design setpoint to 350 psia from 300 psia, and the manual initiation pressure to 300 psia. The new setpoint is enough to provide adequate RCP operating margin and prevent nuisance alarms while maintaining the SDC System within the proposed SAR operating limits. The new design setpoint of 350 psia was evaluated along with the SDC System relief scheme, operating procedures, and adequacy of LTOP relief valves and motor operated valve performance calculations. Therefore, the setpoint and or operating limit changes as well as the calibration and or testing activities involved in this modification do not result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

A variety of strict procedural, administration, and design controls prevent the opening of the SDC isolation valves during normal plant operation (Modes 1-3), thus no credible risk impact exists for operation above the SDC transition periods. Therefore, plant risk is evaluated only for the time periods of transition to and from SDC System operation and for periods when the SDC System is otherwise aligned from the RCS. The two LTOP relief valves are provided to mitigate overpressure events during low temperature conditions due to inadvertent RCS heatup and fill scenarios. The LTOP relief valves are placed in service prior to commencing SDC operations and are set to lift at approximately 445 psia, well below the SDC System design pressure of 575 psia. The SDC initiation pressure is increased to 300 psia and the OPI setpoint is set at 350 psia, well below the LTOP valve settings. No portion of the SDC System is used for LTOP protection or credited in the LTOP analysis. Thus it is evaluated that the increase of the OPI setpoint increase has no risk impact to the LTOP function and does not provide an increase the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

This modification provides the increase of the OPI setpoint from 300 psia to 350 psia and raises the pressure to manually initiate SDC at 300 psia. A review of the FSAR Chapter 15 accidents did not reveal that any of the accidents were the result of the OPI function failing to operate properly when required, operating at pressures in excess of safe system design pressure rating, due to the operator failing to initiate shutdown cooling at a sufficiently low pressure. The OPI function is not credited for overpressure protection. The OPI is not credited for mitigating actions for overpressure protection of the SDC, but provides an addition feature to alert the operator that the RCS is above the pressure. The new OPI setpoint and initiation pressure are well within the SDC System design rating and low enough to prevent spurious actuation of the LTOP valves. There is no impact to an accident mitigator. There are no accidents which if combined with this modification could result in any increase in radiological dose increase.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

Over pressure protection of the SDC System is provided by the LTOP valves. The two LTOP relief valves are provided to mitigate overpressure events during low temperature conditions due to inadvertent RCS heatup and fill scenarios. The LTOP relief valves are placed in service prior to commencing SDC operations and are set to lift at approximately 445 psia, well below the SDC System design pressure of 575 psia. No portion of the SDC System is used for LTOP protection or credited in the LTOP analysis. Thus it is evaluated that increase of the OPI setpoint from 300 psia to 350 psia and raising the manual initiation pressure to 300 psia have no risk impact to the LTOP function and does not increase the consequence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The OPI function was not considered an accident initiator, nor does the raising of the OPI setpoint or raising the manual initiation pressure of SDC create a new accident initiator. Therefore this modification does not create a possibility for an accident of a different type than any previously evaluated in the FSAR.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS

This modification provides the increase of the OPI setpoint from 300 psia to 350 psia and raises the pressure to manually initiate SDC to 300 psia. The Open Permissive Interlock will remain operational. The two LTOP relief valves are provided to mitigate overpressure events during low temperature conditions are due to inadvertent RCS heatup and fill scenarios. The SDC isolation valves remain unchanged. The LTOP relief valves are placed in service prior to commencing SDC operations and are set to lift at approximately 445 psia, well below the SDC System design pressure of 575 psia. The setpoint change from 300 psia to 350 psia and raising the SDC manual initiation pressure to 300 psia using existing components and is bounded by the design pressure of the SDC System and does not present a different type of malfunction to the SDC System. Therefore this modification does not create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

The parameters for fission product barriers including fuel cladding, RCS boundary and containment were reviewed. None of these parameters were affected by this modification. Therefore this modification does not result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

This modification provides the increase of the OPI setpoint from 300 psia to 350 psia and raises the pressure to manually initiate SDC to 300 psia. There is no change in the analysis methodology for the increase in setpoint. The acceptability of the modification of the affected equipment is evaluated by analysis and incorporated by reference into the FSAR. Therefore this modification does not result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ANO 50.59 Evaluation Number

2004-026

I. OVERVIEW / SIGNATURES

Facility: ANO-Unit-2

Document Reviewed: ER-ANO-2002-0393-000 **Change/Rev.:** 0

System Designator(s)/Description: Change Containment Atmosphere Monitoring System (CAMS) high and low flow sample pump trips to alarm only

Description of Proposed Change

ER-ANO-2002-0393-000 will disable the high or low CAMS sample pump trip function. The CAMS high and low flow alarm will remain, however the pump will no longer trip on low or high flow.

High and low flow trips have been a major cause of functional failures on the CAMS units. A sample pump trip makes both the gas and particulate channels inoperable. A CAMS unit constitutes two of the three channels required by Technical Specifications (TS). Operational experience indicates that these trips are often caused by momentary perturbation in flow. The operating band (10scfm ± 2scfm) is fairly tight. Operations checks the flow frequently (every shift) and adjusts the flow back to the center of the band if necessary. The current alarm will be sufficient to avoid operating outside of the required band.

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	EDITORIAL CHANGE of a Licensing Basis Document	Section I
☐	SCREENING	Sections I and II required
☐	50.59 EVALUATION EXEMPTION	Sections I, II, and III required
☒	50.59 EVALUATION (#: ENN#04-026)	Sections I, II, and IV required

Preparer: Nick Mehta / N. Mehta EOI /EFIN/System Engineering/ 11/23/04
Name (print) / Signature / Company / Department / Date

Reviewer: Nick Kennedy/ N.R. Kennedy /EOI / System Engineering/ 11/23/04
Name (print) / Signature / Company / Department / Date

OSRC: John R. Eichenberger J.R. Eichenberger 12/2/04
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings (see Section 5.8) and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	☒	☐	Unit-2 SAR Figure 9.4-4 (M-2261 Sheet 2)
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	☒	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	☒	
If "YES", perform an Exemption Review per Section III OR perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. AND initiate an LBD change in accordance with NMM LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2, 3]	☐	☒	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculations Manual[3, 4]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM LI-113. No further 50.59 review is required.			

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

2. **Does the proposed activity involve a test or experiment not described in the FSAR?** ☐ Yes ☒ No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. Basis

Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Discuss other LBDs if impacted. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis. See EOI 50.59 Guidelines Section 5.3.2 for guidance.

The new CAMS configuration is below the level of detail in the ANO-2 Technical Specifications. Therefore, Technical Specifications will not be affected by this design change package.

The Unit-2 SAR contains very little discussion concerning Containment Monitoring and Containment Atmosphere Monitoring System (CAMS). No specific detail about the design and construction of the CAMS and their associated sample pumps is given in SAR text. However, SAR Figure # 9.4-4 (M-2261 Sheet 2) will be impacted by this modification. This drawing has been revised to show the removal of the interlock between the sample pump trip and the high and low flow switches.

This modification will not result in revision being necessary for the Unit-2 SER, QAPM, E-plan, bases for Technical Specifications or the Fire Protection Program. This modification is below the level of detail in these documents.

No new tests or experiments not described in the FSAR are involved by this modification.

4. References

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.4.1[5](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
LRS 50.59-Unit-2	"CAMS", Monitor, "RCS leakage", "RCS"

LBDs/Documents reviewed manually:

Technical Specifications	Sections 3.4.6.1, 4.4.6.1, 4.4.6.2.1, table 4.3-3.
Manual SAR sections	Section 5.2.7.1.1, 12.1.4, 11.4
SAR Figure	SAR Figure # 9.4-4

5. **Is the validity of this Review dependent on any other change?** (See Section 5.3.4 of the EOI 10 CFR 50.59 Program Review Guidelines.) ☐ Yes ☒ No

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	☒	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	☒	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	☒	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	☒	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	☒	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	☒	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	☒	Involve a change to the Fuel Building electrical power?
9.	☐	☒	Involve a change to the Fuel Building ventilation?
10.	☐	☒	Involve a change to the ISFSI security?
11.	☐	☒	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	☒	Involve a change to spent fuel characteristics?
13.	☐	☒	Redefine/change heavy load pathways?
14.	☐	☒	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	☒	Involve a change to the loading bay or supporting components?
16.	☐	☒	New structures near the ISFSI?
17.	☐	☒	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	☒	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes ☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   No accident has been identified in the FSAR due to the failure of a CAMS unit. The CAMS monitors, 2RE-8231-1 and 2RE-8271-2, are part of the RCS leak detection system.

   This modification will disable the high or low flow trip function from the sample pump control circuit logic for both channels 2RE-8231-1 and 2RE-8271-2. However, high and low flow alarms will be retained to notify the operations department of flow conditions outside of the specified range. In addition, the operations department checks the flow frequently (every shift) and adjusts it to maintain it in the specified operating band. Disabling the CAMS sample pump low and high flow trip function will not impact any accident previously evaluated in the FSAR.

   Therefore, the frequency of occurrence of an accident previously evaluated in the FSAR will not increase.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   Removal of the High and Low Flow CAMS sample pump trip will increase the overall availability of the CAMS. In the past, any perturbation in flow would result in the CAMS unit tripping, rendering this channel inoperable and unavailable. The risk of damaging the sample pump due to restricted flow is considered very remote for the following reasons.

   1) The sample stream valves handswitches are currently interlocked with the start and stop circuit for the pump. If a valve misalignment were to occur, the sample pump would still trip and the low flow indicating light and control room annunciator would alert operations to correct the condition.

   2) A ESFAS Containment Isolation or Safety Injection Actuation Signal will stop the pump. This will prevent the pump from running should the sample valves be automatically isolated. This change does not disturb the CIAS and SIAS portion of the control circuits and does not affect the function of those signals on the sample pump logic.

   3) If the flow is only slightly restricted (Degraded) or if there is a filter paper problem that results in a high flow condition, the current indicating lights and the control room annunciator will allow the operating crew to take prompt corrective actions. This action may include readjustment of the flow, replacement of the paper, or if the problem is not immediately correctable, placing the standby CAMS in service.

   In conclusion, since the CAMS units perform no automatic mitigating functions, the potential for a failure of the sample pump is considered insignificant, and the availability of this monitoring equipment will be improved, this modification will not result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

As described in question 1, no accident has been identified in the FSAR due to the failure of CAMS instrumentations. CAMS are monitoring the gaseous and particulate activity levels in the containment building. The failure of CAMS instrumentation~~s~~ will not increase the level of radiation dose or increase the consequences of radiation dose. This modification will not result in a new pathway for release of radioactive material or affect onsite dose in a way that restricts access to vital areas or impedes mitigating actions.

DWA 12/1/04

Therefore, this modification will not result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The control power for 2RE-8231-1 and 2RE-8271-2 are from 2RS1 and 2RS2 cabinets. These power supplies are class 1E and backed by respective diesel generators.

The failure modes described in questions 2 can not initiate a radiological release. In addition, these failures can not block the ability of the associated SSC components to perform their required safety functions.

Therefore, this modification will not result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The modification to the CAMS units will not result in any new failure mode. The pressure boundary, seismic qualification, ESFAS actuation circuits, and the Class 1E power supplies are not affected by this modification. No configuration changes will result in the CAMS units being reclassified as an accident initiator.

Therefore, this modification can not create a possibility for an accident of a different type than any previously evaluated in the FSAR.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The modification to the CAMS units will not result in any new failure mode. The pressure boundary, seismic qualification, ESFAS actuation circuits, and the Class 1E power supplies are not affected by this modification.

The consequences of a CAMS failure have not changed, therefore, this modification will not create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

The CAMS perform no automatic protective functions. The primary purpose of the CAMS is to provide indication of Reactor Coolant System (RCS) Leakage. The changes associated with this modification do not alter the design function of the CAMS units but will increase the availability of these devices to monitor for RCS leakage. The design basis limits associated with RCS leakage are not changed by this modification nor is the ability to monitor this limit.

Therefore, this modification will not result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

This modification will not result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analysis. This deletion of the high and low flow trips from the CAMS sample pumps will not change the system function or the design basis of Reactor Coolant System Leakage Detection System. The ability to monitor and evaluate RCS leakage will not change.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ANO 50.59 Evaluation Number

2004-027

I. OVERVIEW / SIGNATURES

Facility: ANO-Unit 2

Document Reviewed: ER-ANO-2004-933-000 / TAP 04-2-008 mt 12-6-04 **Change/Rev.:** 0

System Designator(s)/Description: Quench Tank Penetration Isolation

Description of Proposed Change

Install Temporary Alteration TAP 04-2-008 to "Disable 2SV-5871-2" This valve is the Rx Bldg penetration 2P-37 Quench Tank/RDT vent header isolation. The TAP will allow compliance with Tech Spec TS 3.6.3.1 that each containment isolation valve must be OPERABLE. Section "b" of that TS states "Isolate each affected penetration within 4 hours by use of at least one deactivated automatic valve secured in the isolation position".

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	EDITORIAL CHANGE of a Licensing Basis Document	Section I
☐	SCREENING	Sections I and II required
☐	50.59 EVALUATION EXEMPTION	Sections I, II, and III required
☒	50.59 EVALUATION (#: EFN# 04-027)	Sections I, II, and IV required

Preparer: Michael Hoyt / Michael Hoyt / EOI / EFIN / 12-06-2004 mt 12-6-04
Name (print) / Signature / Company / Department / Date

Reviewer: Linby Bramlett / Linby Bramlett / EOI / Sys-2 / 12/6/04
Name (print) / Signature / Company / Department / Date

OSRC: J.R. Eichenberger / J.R. Eichenberger 12/6/04
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings (see Section 5.8) and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	☒	☐	Section 11.3.2 Fig. 9.3-2
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	☒	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	☒	
If "YES", perform an Exemption Review per Section III OR perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. AND initiate an LBD change in accordance with NMM LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2, 3]	☐	☒	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculations Manual[3, 4]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM LI-113. No further 50.59 review is required.			

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

2. **Does the proposed activity involve a test or experiment not described in the FSAR?** ☐ Yes ☒ No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. **Basis**

Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Discuss other LBDs if impacted. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis. See EOI 50.59 Guidelines Section 5.3.2 for guidance.

Operating License/Technical Specifications

This T-alt removes power from solenoid valve 2SV-5871-2 which is a containment isolation valve. Tech Spec 3.6.3.1 allows this valve to be deenergized thereby placing the valve in a fail safe configuration. No other LBD other than the FSAR are impacted. Therefore this change does not impact any OL/TS/NRC orders.

FSAR

The FSAR discusses both the closed and open functions of 2SV-5871-2. Since the valve will be placed in the safety / closed position, the FSAR remains accurate for this function. However, the open function is non safety related to allow venting the Quench tank (2T-42), RDT and the regenerative heat exchanger to the waste gas system. This function is typically used for startup operations where it is required that the quench tank is purged to ensure no oxygen is present. Since the valve will be failed close, this function will be defeated and therefore FSAR section 11.3.2 will be inaccurate when this t-alt is present. In addition SAR figure 9.3-1 will no longer accurately depict electrical power to the valve when the t-alt is present. The quench tank's function to vent to containment is still maintained via its relief valve (2PSV-4696) and its rupture disc (2PSV-4695).

Tests or Experiments Considerations

De-energizing the solenoid valve places it in it's safety position and will not degrade the margin of safety and will not put the plant in an unanalyzed mode of operation therefore, this ER does not involve a test or experiment not described in the SAR. De-energizing 2SV-5871-2 will not impact the equipment, procedures or facilities utilized for storing fuel at ANO.

4. **References**

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.4.1[5]](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
LRS Unit 2 50.59	"2SV-5871-2", "2SV-5778-1", "containment w/10 penetration", "isolation w/10 valves",, "quench w/5 sampling"
6.2.4.2,3/ 4.6.3, 9.3.2.3, 11.3.2	
Table 6.2-26,	

LBDs/Documents reviewed manually:

Fig. 9.3-2

5. **Is the validity of this Review dependent on any other change?** (See Section 5.3.4 of the EOI 10 CFR 50.59 Program Review Guidelines.)

☐ Yes

☒ No

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	☒	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	☒	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	☒	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	☒	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	☒	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	☒	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	☒	Involve a change to the Fuel Building electrical power?
9.	☐	☒	Involve a change to the Fuel Building ventilation?
10.	☐	☒	Involve a change to the ISFSI security?
11.	☐	☒	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	☒	Involve a change to spent fuel characteristics?
13.	☐	☒	Redefine/change heavy load pathways?
14.	☐	☒	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	☒	Involve a change to the loading bay or supporting components?
16.	☐	☒	New structures near the ISFSI?
17.	☐	☒	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	☒	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes ☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   De-energizing 2SV-5871-2 will place the valve in it's closed / safety position. This will ensure that the reactor building integrity is maintained which will not increase the frequency of an accident occurring.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   Removing power from the isolation valve to maintain reactor building integrity, will decrease the likelihood of a malfunction of a safety system.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   2SV-5871-2 provides containment isolation for the Quench Tank as described in section 9.3.2.3, Design Criterion. The consequences will not increase as a result of putting the valve in a fail-safe condition. By removing potential power from the valve we have not affected the boundary that could cause release of a radioactive dose.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   Maintaining 2SV-5871-2 closed will not cause a malfunction of the Quench Tank or the reactor building boundary. The Quench Tank is protected by overpressure protection. This change does not cause the reliance on any other component to perform a safety function and therefore does not increase the consequences of a malfunction of a structure or system.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   By removing power from potentially going to 2SV-5871-2 the valve essentially will remain in the same condition that it's at during normal power operations. Therefore an accident of a different type is not created.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   2SV-5871-2 is normally de-energized and closed. By removing the power that potentially could feed the valve, we have not created a new possibility for a malfunction.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

   BASIS:

   Isolation of the Quench Tank vent and in-turn the sample point in cabinet 2C-116, isolates any fission products to the Rx Bldg and does not alter the reactor builing isolation barrier.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

   BASIS:

   This T-Alt does not evaluate the design basis or safety analysis, nor will this T-Alt impact the design or safety analysis

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ANO 50.59 Evaluation Number

2004-028

I. OVERVIEW / SIGNATURES

Facility: ANO Unit 2

Document Reviewed: ER-ANO-2004-0618-000 & Procedure 2607.038 **Change/Rev.:** 0

System Designator(s)/Description: Unit 2 Spent Fuel Pool Reverse Osmosis Filtration Unit

Description of Proposed Change

This ER and procedure provides instructions to install and remove a reverse osmosis skid from the Unit 2 Spent Fuel Pool and its cooling system. It also provides a temporary makeup supply of water to the spent fuel pool. The filtration skid will clean silica and suspended solids from the spent fuel pool. This activity will be a procedurally controlled temporary alteration using a vendor supplied skid. Controls in procedure 2607.038 are specified to monitor SFP level, boron concentrations and chemistry parameters.

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	EDITORIAL CHANGE of a Licensing Basis Document	Section I
☐	SCREENING	Sections I and II required
☐	50.59 EVALUATION EXEMPTION	Sections I, II, and III required
X	50.59 EVALUATION (#: EFN#04-028)	Sections I, II, and IV required

Preparer: Lindy Bramlett / [signature] / EOI / U2 Sys. / 12/9/04
Name (print) / Signature / Company / Department / Date

Reviewer: Steven Smith / [signature] / ENTERGY / SYS ENG / 12/7/04
Name (print) / Signature / Company / Department / Date

OSRC: J.R. Eichenberger / [signature] / 12/9/04
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings (see Section 5.8) and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. **Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?**

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	X	
TS	☐	X	
NRC Orders	☐	X	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	X	☐	Drawing figure 9.1-1 and 9.2-7
TS Bases	☐	X	
Technical Requirements Manual	☐	X	
Core Operating Limits Report	☐	X	
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	X	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	X	
If "YES", perform an Exemption Review per Section III OR perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. AND initiate an LBD change in accordance with NMM LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	X	
Emergency Plan[2,3]	☐	X	
Fire Protection Program[3,4] (includes the Fire Hazards Analysis)	☐	X	
Offsite Dose Calculations Manual[3,4]	☐	X	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM LI-113. No further 50.59 review is required.			

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

2. **Does the proposed activity involve a test or experiment not described in the FSAR?** ☐ Yes X No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. **Basis**

Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Discuss other LBDs if impacted. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis. See EOI 50.59 Guidelines Section 5.3.2 for guidance.

Operating License

This Procedurally controlled T-ALT involves installing a Reverse Osmosis (RO) filtration unit for cleaning contaminants from the spent fuel pool. License based documents do not have limitations on using supplemental equipment to increase purification rate of the spent fuel pool. Information in all documents other than the SAR will not be invalidated. TS LCO 3.9.10 for SFP level requirements and TS 3.9.12c for SFP boron concentration remain under control with existing siphon breaker design and other administrative controls. Therefore no OL/TS/NRC orders are affect by the proposed change.

FSAR

The FSAR, however, shows drawing 9.1-1 which shows valves 2FP-4, 2FP-19 and 2FP-52. These valves will be aligned in a position other than shown on the drawing. SAR 9.2-7 shows 2CT-76 which is aligned other than as shown on the drawing. This valve supplies DI water and has no safety function. The temporary alteration installs a vendor skid reverse osmosis unit to remove silica from the spent fuel pool. The unit is generally self contained such that the unit has minimal interface with the plant. The LBD's do not contain information about vendor skids and therefore specifics concerning the skid are exempt from 50.59 evaluation. The skid, however, interfaces with the plant by changing spent fuel pool water chemistry, creating wastewater, requiring make-up to the pool, by changing valve positions in the fuel pool cooling system and by using electrical power. These interfaces do not adversely impact any safety function of the plant as discussed below. Changing the Spent Fuel Pool Chemistry: The spent fuel pool water is filtered by the RO skid and returned to the pool. The boron concentration of the returned water is slightly lower than the concentration in the pool. The controls for sampling described in the ER and procedure 2607.038 provide assurance that spent fuel pool boron concentration is maintained well above required limits. The only change in water chemistry other than a slight change in boron concentration is reduction of silica, which is the desired objective. Creating Wastewater: Not all of the water is returned to the pool. Some water is sent to the liquid rad waste system for processing. The ER evaluated the volume of wastewater and the rate at which it would be generated. It was determined that the Liquid rad waste system can easily process the water generated by the T-Alt with no impact on normal operations. Make-up to the pool: Demineralized water will be added to the pool as necessary to maintain pool level. The controls for make-up and sampling in procedure 2607.038, provide assurance that spent fuel pool boron concentration is maintained well above required limits. The seismic category I service water makeup remains fully functional. The volume of make-up water is very small and will not challenge the DI water system. SFP level is maintained within specification and the change uses existing siphon breakers to insure design requirements remain unchanged. Use of the RO will not impact plant operations. Valve position for 2CT-76 is in SAR 9.2-7 and will be operated and in different position than shown on drawing. There is no safety fuction associated with this valve and its reposition does not create any safety condition.Valve positions in the Spent Fuel Pool Cooling System: The procedure allows three valves to be placed in positions different than shown on SAR drawing 9.1-1. Valves 2FP-19, 2FP-52 will be opened and 2FP-4 may be throttled as necessary to ensure the skid can operate properly. If it is necessary to throttle 2FP-4 the procedure instructions provide controls to ensure SFP cooling flow is not significantly reduced. This ensures that the cooling system is not degraded below its ability to maintain pool temperature. The impact to this system is minimal and will not impact system operation. Use of Electrical Power: The ER provides instructions for power to operate the vendor skid which utilizes a spare breaker. An evaluation of electrical demand determined that the load created by the skid is well with in the limits of the breaker and will not impact the electrical distribution system.

Tests or Experiments Considerations

The temporary RO filtration system does not involve a test or experiment because both the SFP cooling system and purification system remain fully functional as described by the SAR. These systems and the controls for maintaining SFP operating limits remain functional and the proposed changes do not result in unanalyzed modes of operation. The proposed change is bounded by existing design bases for the SFP cooling and purification system.

4. <u>References</u>

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.4.1[5]](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
50.59 Unit 2	(Spent Fuel, RO, reverse osmosis, silica, boron, siO2, filtration, 2FP-4, 2FP-19, Fuel w/10 pool, pool w/10 cooling, liquid w/10 cool*, siphon)

LBDs/Documents reviewed manually:

SAR figure 9.1-1, fig. 9.2-7, chapter 15.1.23

5. **Is the validity of this Review dependent on any other change?** (See Section 5.3.4 of the EOI 10 CFR 50.59 Program Review Guidelines.)

☐ Yes
X No

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	X	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	X	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	X	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	X	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	X	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	X	Discharge any chemicals new or different from that previously discharged?
7.	☐	X	Change the design or operation of the intake or discharge structures?
8.	☐	X	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	X	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	X	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	X	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	X	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	X	Involve the installation or modification of a stationary or mobile tank?
14.	☐	X	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	X	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	X	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	X	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	X	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	X	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	X	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	X	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	X	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	X	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	X	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	X	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	X	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	X	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	X	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	X	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	X	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	X		Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	X	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	X	Involve a change to the Fuel Building electrical power?
9.	☐	X	Involve a change to the Fuel Building ventilation?
10.	☐	X	Involve a change to the ISFSI security?
11.	☐	X	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	X	Involve a change to spent fuel characteristics?
13.	☐	X	Redefine/change heavy load pathways?
14.	☐	X	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	X	Involve a change to the loading bay or supporting components?
16.	☐	X	New structures near the ISFSI?
17.	☐	X	Modifications to any plant systems that support dry fuel storage activities?
18.	X		Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

III. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A.1, above.

A. Check the applicable boxes below. If any of the boxes are checked, clearly document the basis in Section II.B, below. If none of the boxes are appropriate, perform a 50.59 Evaluation in accordance with Section IV. Provide supporting documentation or references as appropriate.

☐ The proposed activity meets all of the following criteria regarding design function per Section 5.5[1](a):

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of evaluation that demonstrates intended design function(s) of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed activity already exists per Section 5.5[1](b). Reference 50.59 Evaluation # _____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

☐ The NRC has approved the proposed activity or portions thereof per Section 5.5[1](c). Reference: _____

B. Basis

Provide a clear, concise basis for determining the proposed activity may be exempted such that a third-party reviewer can reach the same conclusions. See Section 5.6.6 of the EOI 10 CFR 50.59 Review Program Guidelines for guidance.

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes X No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes X No

   BASIS:

   The proposed change does not increase the frequency of occurrence of an accident previously evaluated in the FSAR because the Chapter 15 analysis is based on a Fuel Handling Accident resulting in a dropped fuel assembly and the proposed change does not impact fuel handling or the frequency of occurrence. The temporary alteration cannot initiate the Chapter 15 event.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes X No

   BASIS:

   This temporary alteration will not result in more than a minimal increase in the likelihood of occurrence of a malfunction of a SSC important to safety previously evaluated in the FSAR. This is because the design of the alteration is bounded by existing design requirements of the system. The potential impact of the t-alt to adverse system conditions are two fold. First the potential to reduce SFP level to adverse levels is prohibited by the design of using the SFP tilt pit fill line (via 2FP-19) which is ultimately attached to the existing siphon breaker. Other lines from the RO unit are prevented from siphoning the pool by controlling their elevation in the pool to be bounded by existing siphon breaker elevations. Therefore the likelihood of a loss of SFP level remains unchanged. Second, the potential to have an uncontrolled leak via the alteration hose connections or pipe break is bounded by existing system design. The existing system includes the three inch purification recirculation line that is not a seismic rated piping line. A break in the discharge of this line would result in an uncontrolled leak greater than the postulated hose break. Since the amount of leakage in both cases will be limited to the SFP level at which the siphon breakers are located, the likelihood of occurrence of a malfunction of a SSC important to safety remains unchanged. Procedural controls prevent an uncontrolled dilution event from violating Technical Specifications. In addition, in the unlikely possibility of a dilution event with the temporary makeup system, it is already bounded by the Chapter 15 Fuel Handling Accident which assumes zero boron concentration in the spent fuel pool.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes X No

   BASIS:

   There is no change in the consequences of any accident or to consequences due to failure of equipment important to safety. The Chapter 15 analysis is based on a Fuel Handling Accident resulting in a dropped fuel assembly and the proposed change does not impact fuel handling or its consequences. The temporary alteration cannot initiate the Chapter 15 event. The spent fuel pool accident analyses bound any credible event associated with this procedurally controlled T-ALT.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes X No

BASIS:

There is no change in the consequences of any accident or to consequences due to failure of equipment important to safety because the T-alt is a non safety related alteration that does not impact safety related equipment. The T-alt utilitizes the existing system siphon breakers and configuration requirements to prevent changes in consequences. The spent fuel pool accident analyses and postulated failures of existing non safety related equipment bound any credible event associated with this procedurally controlled T-ALT.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes X No

BASIS:

The SAR evaluates the spent fuel pool for loss of cooling and loss of inventory to the siphon breaker level. There are no other credible accidents associated with this procedurally controlled T-ALT. Therefore, no new accidents are created. The potential of a dilution event with the temporary makeup system is unlikely because of procedural controls. These controls prevent an uncontrolled dilution event from violating Technical Specifications. In addition, this event is bounded by the Chapter 15 Fuel Handling Accident which assumes zero boron concentration in the spent fuel pool.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes X No

BASIS:

The worst possible event would be a hose rupture on the line supplying the RO unit. The maximum flow rate through this line is significantly below the flow rates which could be experienced by the spent fuel pool cooling system which is non siesmic and is acceptable. Therefore, a malfunction of the spent fuel pool cooling system bounds a similar failure on the procedurally controlled T-ALT piping. The siphon breaker for the SFP cooling suction line is at the 401' elevation and will prevent loss of pool inventory as designed. The installed piping and the T-ALT piping do not create a new malfunction with a different result.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes X No

BASIS:

The reverse osmosis unit will not impact operating systems in such a way that could challenge a fission product barrier. Any break that occurs in T-ALT piping will result in flows rates that are less than the acceptable flow rate loss associated with the spent pool purification flow. The spent fuel pool purification pipe break flow rates bound the flow rates experianced if T-ALT piping ruptures.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes X No

BASIS:

This procedurally controlled T-ALT does not evaluate design bases or safety analyses, nor will this T-ALT impact design bases or safety analyses.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ANO 50.59 Evaluation Number

2004-030

I. OVERVIEW / SIGNATURES

Facility: ANO - Unit 2

Document Reviewed: ER-ANO-2003-0012-029 **Change/Rev.:** 0

System Designator(s)/Description: Boron Dilution Event RWC 12/9/04

Description of Proposed Change

Potential Issue Report #PI-03-010 was issued to address two methodology differences between the CE-fleet method and the Westinghouse-fleet method. It was determined that this report was applicable to ANO-2.

The first difference was in the generation of the active RCS mixing volumes that "participate" in the dilution process. Based on further review it was determined that this difference did not exist in the current analysis of record for this event at ANO-2. This difference will not be discussed further.

The second difference in methods is the modeling of the excore / dilution alarm response. The Westinghouse method models a non-linear excore detector response based on plant startup data. The linear excore response employed in the CE methodology is non-conservative.

The proposed change is to use the Westinghouse method on the excore detector response and to evaluate the impact of this response on the analysis presented in 15.1.4 of the ANO-2 SAR.

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	**EDITORIAL CHANGE of a Licensing Basis Document**	**Section I**
☐	**SCREENING**	**Sections I and II required**
☐	**50.59 EVALUATION EXEMPTION**	**Sections I, II, and III required**
☒	**50.59 EVALUATION (#: FFN 04-030)**	**Sections I, II, and IV required**

Preparer: Robert W. Clark / / ENS / NED / 12/01/04
Name (print) / Signature / Company / Department / Date

Reviewer: Daniel W. Fouts / / ENS / NE / 12-3-04
Name (print) / Signature / Company / Department / Date

OSRC: J.R. Eichenberger / 12-17-04
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings (see Section 5.8) and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. **Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?**

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	☒	☐	15.1.4
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	☒	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	☒	
If "YES", perform an Exemption Review per Section III OR perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. AND initiate an LBD change in accordance with NMM LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2, 3]	☐	☒	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculations Manual[3, 4]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM LI-113. No further 50.59 review is required.			

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

2. **Does the proposed activity involve a test or experiment not described in the FSAR?** ☐ Yes ☒ No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. Basis

Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Discuss other LBDs if impacted. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis. See EOI 50.59 Guidelines Section 5.3.2 for guidance.

BACKGROUND

The boron dilution alarm monitors the neutron flux from the excore detectors using the startup channels. When the count rate increases by a fixed factor (i.e., the boron dilution alarm setpoint (BDAS)), an alarm is activated. For ANO-2 boron dilution event analysis of record, BDAS was used to determine the amount of shutdown margin (SDM) remaining at the time of the alarm using the linear 1 / ρ approach in Modes 3, 4, and 5. The SDM is used to determine the boron concentration at the time of the boron dilution alarm. From this concentration, the inverse boron worth (IBW) versus critical boron concentration (CBC) limit lines for physics is generated, such that sufficient time for operation action is preserved.

For those Westinghouse-fleet plants that Westinghouse prepares the boron dilution calculations for, the Inverse Count Rate Ratio (ICRR) method is used. The ICRR method uses the measured detector count rate versus boron concentration at a fixed rod position and temperature. As the RCS boron concentration decreases to the critical concentration, the detector response for large differences between the initial and critical boron concentrations begins as a linear function. However, as the boron concentration approaches the critical boron concentration (~150 ppm from the critical boron concentration), the detector count rate increases at a faster non-linear rate. Westinghouse has collected measured data from numerous Westinghouse-fleet plant start-ups and generated a generic, conservative ICRR curve. Westinghouse-fleet plants use this generic ICRR curve or have alternately used a plant-specific ICRR curve in the boron dilution analyses for sub-critical modes of operation.

CE-fleet plants use a detector signal that is proportional to the sub-critical multiplication factor (M). CE reviewed similar startup data for the CE-fleet plants and concluded that the sub-critical multiplication was inversely proportional to the reactivity and was an acceptable approximation. In a direct comparison between the two methods, the non-linear method resulted in a longer time to reach the BDAS from the start of the event and thus a shorter time to criticality after the BDAS is reached.

During the aforementioned CE-fleet boron dilution analysis, plant-specific startup data was reviewed and was found to be non-linear and consistent with the generic Westinghouse ICRR data. Upon a second review of the CE-fleet startup data, it was concluded that the CE-fleet methodology for the BDAS, using the linear approximation had introduced some degree of non-conservatism into the calculation involving the BDAS.

The only impact of the non-conservative linear approximation is in the calculation of the time that the BDAS is reached and the calculation of the time from the alarm to the time of criticality. The overall time of criticality from the start of the event is not affected. There is no impact on the analyses that do not use the boron dilution alarm.

Based on the above, the alarm operable limit lines for IBW versus CBC for Modes 3, 4, and 5 (filled and drained) are non-conservative and need to be revised. The Mode 3, 4, and 5 (filled and drained) alarms inoperable limit lines for IBW versus CBC are not impacted by this error and remain valid.

This change does not impact the limit lines for Modes 1, 2, and 6 since the boron dilution alarm is not used in these modes.

This analysis of the change in the detector response characteristic is for Cycle 17 only. These changes will be included in the Cycle 18 reload analysis efforts.

The criterion for the modes of operation in question is that the operators have at least 15 minutes from the time the alarm comes in to respond to the event.

Cycle 17 specific physics data for IBW and CBC were used to determine the Modes 3, 4, and 5 (filled and drained) times from alarm to criticality assuming non-linear excore response for the conditions when the boron dilution alarm is operable. The shortest time from time of alarm to time of criticality is 27.8 minutes for Mode 5 drained. All other times from time of alarm to time of criticality for the modes of concern is greater than 27.8 minutes (e.g., Mode 3 – 39.7 minutes; Mode 4 – 45.1 minutes; Mode 5 filled – 44.5 minutes). Since all the times are greater than the 15 minutes acceptance criteria, the current alarm setpoint of 1.5 in conjunction with calculation Cycle 17 specific data do not result in an unsafe or unanalyzed condition.

RESPONSE TO QUESTIONS

1. Licensing Basis Documents

a. Operating License

The Operating License documents do lay out some requirements for boron concentration that are used as initial conditions for the boron dilution analyses; however these documents do not describe the methodology used in the analysis of this event. This proposed change is beyond the scope of these documents. These documents do not require revision due to this proposed change.

b. LBDs Controlled Under 50.59

Section 15.1.4 of the ANO-2 SAR discussed the boron dilution event. It describes the analyses for Modes 3, 4 and 5 (filled and drained) conditions. This section of the SAR requires a revision to address this change in the excore response. Therefore an evaluation will be performed.

The discussion provided in the SERs and the bases of the ANO-2 Technical Specifications concerning boron dilution and boron concentration is general in nature. The detail provided in the SERs does not prevent the change in the analysis.

The proposed change is beyond the scope of the COLR and the TRM.

c. LBDs Controlled Under Other Regulations

The proposed change is beyond the scope of the QAPM, Emergency Plan, Fire Hazards Analysis and the ODCM. These documents contain no details related to the boron dilution analysis.

2. Does the proposed activity involve a test or experiment not described in the SAR?

As discussed above, the ANO-2 SAR does describe the boron dilution analyses for each mode and configuration of operation. The overall methodology used in the analyses is not being revised just the response of the excore detectors. This response characteristic is based upon measured startup data. This proposed change does not constitute or involve a test or experiment not described in the SAR.

4. References

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.4.1[5]](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search: "boron dilution"; ICRR; "Inverse Count Rate Ratio"; IBW; "Inverse Boron Worth"; CBC; "Critical Boron Concentration"; UBDI

AUTONOMY – 50.59 – Unit 2

LBDs/Documents reviewed manually:

ANO-2 SAR 15.1.4 (and associated tables and figures)

SER 24, 104, 196, 126, 227, 244, and 250

ANO-2 Tech Spec and Bases 3 / 4.1.1.3; 3 / 4.9.1, and 3 / 4.9.5

5. **Is the validity of this Review dependent on any other change?** (See Section 5.3.4 of the EOI 10 CFR 50.59 Program Review Guidelines.)

☐ Yes
☒ No

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	☒	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	☒	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	☒	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	☒	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	☒	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	☒	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	☒	Involve a change to the Fuel Building electrical power?
9.	☐	☒	Involve a change to the Fuel Building ventilation?
10.	☐	☒	Involve a change to the ISFSI security?
11.	☐	☒	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	☒	Involve a change to spent fuel characteristics?
13.	☐	☒	Redefine/change heavy load pathways?
14.	☐	☒	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	☒	Involve a change to the loading bay or supporting components?
16.	☐	☒	New structures near the ISFSI?
17.	☐	☒	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	☒	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below.

☐ Yes
☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

The initiation of an inadvertent dilution requires a series of misoperations. These misoperations include the failure of the makeup controller mode selector switch to "Dilute" or the demineralizer water control valve fails to close when the makeup pumps are running. Changing the dilution alarm response from a linear to a non-linear form does not effect the initiation of this event. Therefore the likelihood of a boron dilution event is unchanged due to this change.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

The change in the assumed excore response characteristic does not impact the operation of the unit. This proposed change does not involve any changes in equipment. The function and duty of the structures, systems and components important to safety will not be altered. Therefore, the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the SAR will not be increased.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The boron dilution events are considered Anticipated Operating Occurrences (AOOs). AOOs are defined as events whose occurrence "is postulated despite the precautions taken to prevent their happening" once during the life of the plant. "The potential consequences of such occurrences are ... examined to determine their effect on the plant, to determine whether plant design is adequate to minimize the consequences of such occurrences, and to assure that the health and safety of the public and plant personnel are protected from the consequences." The design comprises (a) the constraints on the initial conditions of plant operations and (b) RPS actions which mitigate the consequences of the AOOs such that neither the Specified Acceptable Fuel Design Limits (SAFDLs) nor component design limits are violated.

The initial conditions (e.g., IBW, CBC, dilution rate, RCS volume, etc.) of this event have not changed. The only change is the response characteristic of the excore detector.

In order to ensure the SAFDLs and the RCS pressure boundary limits are not exceeded, three criteria were established for these events. These limits are DNBR > 1.25; LHR < 21.0 kW/ft, and the peak RCS pressure less than 2500 psia. These limits are indirectly demonstrated to be satisfied by ensuring that an uncontrolled criticality will not occur while using the NRC specified times for operator action. The NRC specified time for operator action for these modes is 15 minutes from the time the alarm comes in. As discussed earlier, the minimum time the operator has is 27.8 minutes, significantly longer than the acceptance criteria.

These events remain classified as AOOs.

As discussed above, the boron dilution events that were reanalyzed due to the change in the excore response characteristic do not challenge the results or criteria accepted by the NRC. As such, there is no change to the radiological release rate / duration, no new release mechanism can be postulated and no impact will occur to any radiation release barrier. Therefore, this change will not result in more than a minimal increase in the consequences of an accident previously evaluated in the SAR.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

This proposed change only affects the boron dilution events that credit the boron dilution alarm system being operable. This change does not impact the analyses for when the alarm system is inoperable. The proposed change is only in the response characteristics assumed in the analysis. There are no changes in the assumptions concerning equipment availability or failure modes were made and no new equipment is required. Therefore, the consequences of a malfunction of a structure, system, or component important to safety will not be increased.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The proposed change is to the response characteristic of the excore detector only. These events that were reanalyzed do not require any new equipment or alter the way in which the plant operates. No initiators to any of the accidents are impacted by this reanalysis. Therefore, the possibility of an accident of a different type than any previously evaluated in the ANO-2 SAR will not be created.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The excore detector and the boron dilution alarm system are not altered by the proposed change. The change in the response of the alarm system is based upon plant startup data. None of the initiators to any of the accidents are impacted by this change. The events that were required to be reanalyzed do not require new equipment or alter the way in which the plant is operated. No changes in the failure modes of the equipment important to safety were assumed in the reanalysis. Based upon the above, the possibility of a malfunction of a structure, system or component important to safety with a different result than any previously evaluated in the ANO-2 SAR will be unchanged.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

The fuel SAFDLs are indirectly demonstrated to be satisfied by ensuring that an uncontrolled criticality will not occur while using the NRC specified times for operator corrective action. By showing that an uncontrolled criticality event does not occur due to an uncontrolled boron dilution event, while using the NRC specified times for operator action, the peak RCS pressure and radiological dose criterion are indirectly demonstrated to be satisfied as well. By showing these criteria are not exceeded then the design basis limit for a fission product barrier is not exceeded or altered.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

The approach used in this analysis is consistent with the approach presented in SAR 15.1.4. The change in the application of the source range signal versus the boron change from criticality is not a methodology change. The only change is from using an exact linear function for the source range signal response to using a curve fit of a measured source range signal response when the boron dilution alarm system is in operation. Consequently, the analysis generated for this condition is consistent with the current licensing basis of ANO-2.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ANO 50.59 Evaluation Number

2005-002

I. OVERVIEW / SIGNATURES

Facility: ANO- Unit 2

Document Reviewed: TAP 04-02-007 / ER-ANO-2004-0098-002 **Change/Rev.:** 0

System Designator(s)/Description: Emergency Cooling Pond (ECP) / Service Water (SW) / 2R17 Hydrolazing 2HBC-83-30" – Temporary Alteration for Utilization of a Temporary Water Barrier Installed at the Unit 2 SW ECP Discharge Structure (DS) Outfall

Description of Proposed Change

TAP 04-02-007 and its associated ER-ANO-2004-0098-002 provides for the use of a safety related and seismic designed temporary water barrier that will be installed at the Unit 2 SW ECP DS for the purpose of isolating the Unit 2 30" SW ECP return pipe 2HBC-83-30" from the ECP and become temporary portion of the ECP boundary, and will allow dewatering the inside of the Unit 2 SW ECP DS. The installation of the temporary water barrier per this TAP / ER will permit hydrolazing activities to be performed during 2R17. The temporary water barrier will be located at the outfall of the SW ECP DS 60" discharge pipe in the ECP. A temporary tornado missile protection plate will be placed and located to protect the temporary water barrier against tornado generated missiles in the event of severe weather. An engineered temporary coffer dam design option has been provided for field use to be installed inside the ECP directly in front of the SW ECP DS discharge where the temporary water barrier is to be located so the location can be dewatered for installation of anchor bolts to secure the temporary water barrier as well as the temporary tornado missile protection plate. The temporary coffer dam will be attached to the Unit 2 SW ECP DS using construction cables / come-a-longs.

The scope of the 5059 is limited to the safety evaluation for the utilization of the temporary water barrier as described above.

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	**EDITORIAL CHANGE of a Licensing Basis Document**	**Section I**
☐	**SCREENING**	**Sections I and II required**
☐	**50.59 EVALUATION EXEMPTION**	**Sections I, II, and III required**
☒	**50.59 EVALUATION (#: FFN 05-002)**	**Sections I, II, and IV required**

Preparer: Ken Baird / / EOI / DE / 1/19/05

David Bice / / EOI / Licensing / 1/19/05

Name (print) / Signature / Company / Department / Date

Reviewer: **Additional Reviewer as deemed req'd. here**

Bill Rowlett / / EOI / SYE / 1/19/05

Name (print) / Signature / Company / Department / Date

OSRC: 01/20/05

Chairman's Name (print) / Signature / Date

[Required only for Programmatic Exclusion Screenings (see Section 5.8) and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	☒	☐	Unit 2 SAR Figures 3.8-25 (drawing C-2067 section C & detail 5) and 9.2-1 (P&ID drawing M-2210 sheet 1), Unit 1 SAR 9.3.2.4, Unit 2 SAR page 1.2-9 1.2.2.10.C page 9.3-12
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	☒	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	☒	
If "YES", perform an Exemption Review per Section III <u>OR</u> perform a 50.59 Evaluation per Section IV <u>OR</u> obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. <u>AND</u> initiate an LBD change in accordance with NMM LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2, 3]	☐	☒	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculations Manual[3, 4]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation <u>AND</u> initiate an LBD change in accordance with NMM LI-113. No further 50.59 review is required.			

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

2. Does the proposed activity involve a test or experiment not described in the FSAR? ☐ Yes ☒ No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. Basis

With the temporary water barrier installed, Unit 2 SAR figures 3.8-25 (drawing C-2067 section C & detail 5) and 9.2-1 (P&ID drawing M-2210 sheet 1) will be inaccurate in that the temporary water barrier will not be depicted on the figures / drawings to indicate that the Unit 2 ECP return path is not available. Section 1.2.2.10 of the Unit 2 SAR and section 9.3.2.4 of the Unit 1 SAR state that the pipe inlets and exits at the ECP will not become blocked by virtue of their designs. The temporary water barrier plate will block the outlet from the Unit 2 SW system at the ECP. Therefore, the impact of the barrier installation will be evaluated in Section IV of this 50.59.

Because the ECP boundary and inventory will be maintained in an operable condition throughout the proposed evolution, this temporary alteration (TAP), i.e., the loss of Unit 2 SW makeup to the ECP, is beyond the level of detail of any ANO Unit 1 LBDs. Therefore, other than the SAR impact described above, no other Unit 1 LBDs are impacted.

Unit 2 is committed (SAR Section 9.3.2.4) to maintaining the capability to makeup to the ECP from the SW system upon initiation of a loss of Lake Dardanelle event. This ensures sufficient ECP inventory for all associated Mode 1-4 Design Basis Accidents (DBAs). This capability is not required in Modes 5 or 6 nor is the ECP required in Modes 5 or 6, except for operability of the Control Room Emergency Ventilation (CREVS) and Air Conditioning Systems (CREACS) during the handling of irradiated fuel. However, the installation of the temporary barrier does not prevent SW being supplied to components required to support CREVS or CREACS provided a SW return path to Lake Dardanelle remains available. In the event of a loss of Lake Dardanelle, sufficient time is expected to be available to remove the temporary barrier and restore Unit 2 SW return capability to the ECP prior to transferring SW pump suction to the ECP. As an additional compensatory measure, action can be taken to align Unit 1 SW returns to the ECP upon notification of a loss of lake event. This is expected to ensure maintenance of ECP level during the removal of the temporary barrier. Makeup to the ECP can also be obtained from other sources (such as city water supply) as desired. Because Unit 2 will be in Mode 6 with RCS level > 23', the restoration of the SW return header to the ECP is expected to be completed well before time-to-core-boiling. The aforementioned commitment and scenario is beyond the level of detail as described in the TS or other LBDs. Therefore, no Unit 2 LBD, other than the SAR, is impacted by this TAP.

Tests or Experiments Considerations: No changes to an existing test or experiment will result due to the installation of the temporary water barrier plate. The installation and removal of the temporary water barrier will be controlled by Temporary Alteration (TAP 04-02-007) per Entergy Operations Incorporated Arkansas Nuclear One 'Control of Temporary Alterations' Procedure 1000.028. Therefore, the evaluation and installation of the temporary water barrier plate does not involve a test or experiment not described in the FSAR.

There is no departure from the design bases since all of the design bases remain intact before, during, & after the proposed Temporary Alteration to install the temporary water barrier necessary for the hydrolyze cleaning of the SW ECP return pipe. Therefore, the ER / TAP does not involve a test or experiments not described in the FSAR.

4. References

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.4.1[5]](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
LRS 50.59 Common	ECP, Cooling Pond, Return Line, Emergency Cooling Pond, Service Water Discharge Structure, Water Barrier, Return Line, Return Pipe, Buried Pipe, Seismic Structure, Discharge Structure, Temporary Barrier, Flood Barrier, Hydrolazing, Service Water Cleaning, Ultimate Heat Sink

LBDs/Documents reviewed manually:

2SAR Sec. 1.2.2, 9.2.1, 9.2.5, 9.2.5.2.1.2; 2SAR Tables 3.2-2, 3.2-6, 9.2-5, 9.2-6, 9.2-17, 9.2-18; 2SAR Figures 2.5-21, 3.8-25, 9.2-1, 9.2-8, 9.2-10, 9.2-11, 9.2-14, 9.2-15, 9.2-16, 9.2-19, 9.2-20; 2TS 3 / 4.7.4 and bases, 3.7.4.1; 1SAR Sec. 9.3, 9.3.2.1, 9.3.2.4; 1SAR Tables 9-17 & 9-18; 1SAR Figures 9-22, 9-23, 9-24, & 9-25; 1TS 3.7.8, 3.11 and bases

5. **Is the validity of this Review dependent on any other change?** (See Section 5.3.4 of the EOI 10 CFR 50.59 Program Review Guidelines.)

☐ Yes
☒ No

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☒	☐	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

The existing security barrier as shown on drawing C-2067 section K will be required to be removed during the time that the installation of the temporary water barrier is to be installed and located at the Unit 2 SW ECP DS for the purpose of performing the hydrolazing task on the Unit 2 30" SW ECP return pipe (i.e., 2HBC-83-30"). The security barrier will be removed during the time that the temporary water barrier plate is installed prior to, during, and immediately following the activities required for the hydrolazing of the SW return pipe during 2R17. Per discussion with Mike Higgins, ANO Security department Superintendent, when the security barrier is removed there will be additional security compensatory measures required. The required compensatory measures will be determined and provided by the ANO Security department. Refer to email per Mike Higgins (provided below) for addition details and information. The security barrier will be replaced after hydrolazing activities are completed. Per Mike Higgins, the email provided by him was satisfactory documentation from the ANO Security department as providing the required Security Plan Review. The ER Engineering instructions have included steps to notify ANO Security prior to removing the security barrier and when the security barrier is to be re-installed for their inspection.

From: HIGGINS, MICHAEL R
Sent: Thursday, September 23, 2004 11:23 AM
To: BAIRD, KENNETH W
Cc: JEFFERY, KENNETH D; BOND, VINCENT S
Subject: RE: ER-ANO-2004-0098-001 Installation of Anchor Bolts at the SW ECP Discharge Structure (and includes ER-ANO-2004-0098-002 / TAP 04-02-007)

This will not change the security plan but we will be required to have compensatory measures in place prior to removal of the security barrier. This needs to be added to the work planning process.

Mike

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	☒	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	☒	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	☒	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	☒	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	☒	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	☒	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	☒	Involve a change to the Fuel Building electrical power?
9.	☐	☒	Involve a change to the Fuel Building ventilation?
10.	☐	☒	Involve a change to the ISFSI security?
11.	☐	☒	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	☒	Involve a change to spent fuel characteristics?
13.	☐	☒	Redefine/change heavy load pathways?
14.	☐	☒	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	☒	Involve a change to the loading bay or supporting components?
16.	☐	☒	New structures near the ISFSI?
17.	☐	☒	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	☒	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

III. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A.1, above.

A. Check the applicable boxes below. If any of the boxes are checked, clearly document the basis in Section II.B, below. If none of the boxes are appropriate, perform a 50.59 Evaluation in accordance with Section IV. Provide supporting documentation or references as appropriate.

☐ The proposed activity meets all of the following criteria regarding design function per Section 5.5[1](a):

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of evaluation that demonstrates intended design function(s) of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed activity already exists per Section 5.5[1](b). Reference 50.59 Evaluation # _____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

☐ The NRC has approved the proposed activity or portions thereof per Section 5.5[1](c). Reference: _____

B. Basis

Provide a clear, concise basis for determining the proposed activity may be exempted such that a third-party reviewer can reach the same conclusions. See Section 5.6.6 of the EOI 10 CFR 50.59 Review Program Guidelines for guidance.

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes ☒ No

The ECP provides one of two (the Dardanelle Reservoir being the other) ultimate heat sink sources for Unit 2 per Section 9.2.5 'Ultimate Heat Sink' of the Unit 2 SAR. Section 9.2.5.2.1.2 'Intake and Discharge Pipes and Related Pond Structures' states that the SW discharge line terminate in a Seismic Category 1 outlet structure on the ECP perimeter. Table 3.2-2 'Seismic Categories of SSC' of the Unit 2 SAR lists the ECP as a 'Q-List' & 'Seismic Category' I structure. Table 3.2-6 'Quality Assurance Summary Level 'Q-List' of the Unit 2 SAR lists the ECP and pipelines as Civil-Structural items required to be within the scope of the Nuclear Quality Assurance program. The Unit 2 SW return pipe DS serves as a boundary for the ECP water inventory. In addition, Unit 2 is committed to initiate makeup to the ECP from the SW system upon indications of a loss of Lake Dardanelle. This ensures sufficient ECP inventory will be available, prior to transferring SW pump suctions to the ECP, for all associated Design Basis Accidents (DBAs).

The installation of a temporary water barrier will not impact the design function of the Unit 2 SW return pipe DS as an ECP boundary, nor will the installation of a temporary water barrier alter the inventory capacity of the ECP (and thus will not impact the operation of Unit 1 regarding reliability on the ECP inventory). The barrier installation will remove the capability to provide makeup to the ECP from the Unit 2 SW system. However, there are no Unit 2 DBAs that rely on ECP inventory in Modes 5 and 6. Because the barrier will not be installed in Modes 1-4, the loss of this makeup is acceptable.

Minimal ECP inventory leakage past the temporary water barrier is potentially possible. Since the ECP inventory is required for Unit 1 continued operations, the water level for the ECP for operation of Unit 1 is the criteria by which leakage by the temporary water barrier is of concern. Based upon this the criteria taken per Procedure 1306.037 'Surveillance Test For Unit 1 Sluice Gates SG-1 & SG-2' is used to establish an acceptable amount of ECP water leakage by the barrier. Per Procedure 1306.037, the ECP water leakage is limited to less than or equal to 10 gallons per minute (gpm). Therefore, leakage past the temporary water barrier will be limited to 10gpm. The water leakage will be determined by post installation testing as required per the Engineering instructions specified in the ER.

The temporary water barrier, temporary tornado missile protection plate, and provided engineered coffer dam will be placed inside the ECP boundary. These items are of sufficient weight such that they will immediately sink if they are dropped into the ECP. Therefore, these items would not block the Unit 2 or Unit 1 SW intake structures, nor the Unit 1 DS if dropped into the ECP boundary. The engineering instructions provided in the ER include requirements to control and account for items that could float and become lodged on the intake screens of the Unit 1 and Unit 2 SW intakes, discharge screens / grates. It should also be noted that the screens on the Unit 1 and Unit 2 SW intake structures are routinely inspected and cleaned.

The Unit 2 SW ECP DS is noted as a 'Q-List' (i.e, Safety Related) seismic structure. The temporary water barrier and anchorage has been designed for safety related and seismic criteria. The SW return line will be in a closed system configuration and must be tagged OOS by Operations prior to installation of the TAP. Likewise the SW pipe will remain tagged out by Operations until the TAP is removed. Thus the only time the safety related and seismic design function for the temporary water barrier is required will be when it is needed to isolate the ECP from the SW return pipe, acting as part of the ECP boundary. The temporary tornado missile protection plate and engineered coffer dam will be installed and located in such a configuration that they will not become seismic II/I concerns for the installed temporary water barrier or the SW ECP DS concrete structure while the TAP is installed on the Unit 2 SW ECP DS. The seismic II/I concerns / issues have been addressed in the ER.

As described in Section III of this 50.59, no LBDs, other than the SAR, are impacted by this TAP. Therefore, this evaluation will be limited to assessing the impact of this TAP on both unit SARs.

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   Neither the ECP nor the Unit 2 SW system are accident initiators. Since this Temporary Alteration only affects the ECP and Unit 2 SW return to the ECP, it can not increase the frequency of occurrence of an accident previously evaluated in the SAR. Since the ECP remains fully functional and operable during the Temporary Alteration evolution, there is no increase in the frequency of occurrence of an accident previously evaluated in the FSAR. The temporary water barrier will be a temporary component in the ECP boundary and is designed to withstand seismic accelerations and remain intact. Protection from natural phenomena such as tornado missiles is afforded by an additional temporary missile shield. Therefore, the attachment of the temporary water barrier to the SW ECP DS will not result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   The temporary water barrier to be installed will be a temporary ECP boundary to isolate the Unit 2 SW return pipe. Failure of the ECP boundary is the only potential SSC malfunction that could be introduced from the addition of the temporary water barrier plate, however the temporary water barrier is designed as a safety related and seismic barrier to remain intact to the Unit 2 SW ECP DS during the Temporary Alteration configuration. The temporary water barrier is protected from natural phenomena such as tornado missiles. Therefore the failure of the temporary water barrier is within design basis criteria design such that its failure is reasonably precluded. Therefore, the temporary alteration will not result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   There are no identified accidents evaluated in the FSAR regarding the isolation of the Unit 2 SW ECP DS. Therefore, no consequences would be altered by the installation of a temporary water barrier to the Unit 2 SW ECP DS. The temporary water barrier is designed to withstand seismic accelerations and to provide its intended design function (i.e., ECP boundary). Thus no change or consequences in radiation doses would increase by installation of the temporary water barrier. The SAR and TS of both Units require limits for operation regarding the level of the ECP. The ECP water level will remain in acceptable level for continued operation of Unit 1 and for shutdown operations of Unit 2. Since Unit 1 will be the Unit required to have the level in the ECP as required by the SAR / TS, this is the limit that will be set and required to be maintained. Should a loss of lake Dardanelle event occur, ECP level may be increased by makeup from the Unit 1 SW system, makeup from city water supply, and/or removal of the barrier to permit makeup from the Unit 2 SW system, prior to transferring SW pump suctions to the ECP. Since the required ECP water volume is maintained, the consequences of an accident previously evaluated in the SAR are not more than minimally increased.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

Water inventory loss out of the ECP are bounded by the current analysis. The installation of the water barrier plate does not alter or change these analyses as the temporary water barrier is designed to withstand seismic accelerations and to provide its intended design function (i.e., ECP boundary). Thus no change in radiological releases would be realized by installation of the temporary water barrier. The temporary water barrier is designed to withstand seismic accelerations and to provide its intended design function (i.e., ECP boundary), thus precluding the failure of the temporary water barrier. Therefore, the installation of a temporary water barrier to be part of the ECP boundary will not have an impact on continued operation of Unit 1, or result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR.

With Unit 2 in Mode 6 and RCS level > 23', very few safety related components are required to be operable and the RCS time-to-boil is substantial. Should a loss of lake Dardanelle occur, the temporary barrier will be immediately removed (which requires returning the SW return pipe to a closed system and the removal of the TAP) to establish a return path for the Unit 2 SW systems that will be needed once lake level drops to a level that requires transferring the Unit 2 SW pump suctions to the ECP. Although a finite period of time is expected to be afforded before this transfer is required, Unit 1 SW header returns can be aligned to the ECP upon notification of a loss of lake event. This will support continued ECP inventory operability in the event of any Unit 2 SW losses while the temporary barrier is being removed. Based on these compensatory measures and the sufficient time-to-boil provided, sufficient time is expected to be available to re-establish the Unit 2 SW return path to the ECP. Therefore, with consideration of Unit 2, the installation of the temporary barrier will not result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

Loss of ECP water volume is not an accident initiator for either Unit, and will not create an accident in either Unit of a different type than previously evaluated in the FSAR. Water inventory loss out of the ECP and flooding of the auxiliary building extension are bounded by current analysis. With the temporary water barrier plate installed, the ECP required water volume is maintained such that it will remain within its required inventory limits. The installed temporary water barrier configuration is designed for applicable loadings and seismic accelerations so that the water barrier will remain in-place, and is afforded tornado missile protection by a temporary tornado missile plate. Therefore the failure of the temporary water barrier is within design basis criteria design such that its failure is precluded. Therefore, the installation of the temporary water barrier will not create a possibility for an accident of a different type than any previously evaluated in the FSAR.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

With the temporary water barrier plate installed, the ECP required water volume is maintained and will remain within its required overall limits. The installed temporary water barrier configuration is designed to applicable loadings and seismic accelerations so that the water barrier will remain in-place, and is afforded tornado missile protection by a temporary tornado missile plate. Therefore the failure of the temporary water barrier is within design basis criteria design such that its failure is precluded. Also, with the temporary water barrier plate installed and the Unit 2 SW ECP return piping inoperable, the temporary water barrier plate will only be installed in a condition where the ECP where this configuration will not significantly challenge nuclear safety. Therefore, there is no credible possibility that the ECP or any other SSC would malfunction in any manner different than that previously evaluated in the FSAR. Therefore, the installation of the temporary water barrier will not result in creating a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

The ECP, as the ultimate heat sink, provides the heat rejection for the RCS for safe shutdown or LOCA heat rejection should the lake not be available. With the Unit 2 SW return line out of service, the ECP must remain operable for use by Unit 1. The volume of water required in the ECP to perform a safe shutdown is maintained with the installation of the temporary water barrier. For Unit 2, as described previously, sufficient time is afforded to remove the temporary barrier in support of re-establishing a Unit 2 SW return path to the ECP long before core boiling would be achieved. Therefore, there is no change in the configuration of the ECP or SW return pipe that would result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

The installation of a temporary barrier in the Unit 2 SW return piping to the ECP does not involve any new test or experiment, nor is it relevant to any evaluation or analysis method current relied upon in the FSAR. There is no departure from the methodology of evaluation for establishing the design bases since all of the design bases remain intact before, during, & after the proposed Temporary Alteration to install the temporary water barrier necessary for the hydrolyze cleaning of the SW ECP return pipe.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ANO 50.59 Evaluation Number

2005-004

I. OVERVIEW / SIGNATURES

Facility: ANO - Common

Document Reviewed: ER-ANO-2002-1078-009, ANO-1 SG/RVCH Replacement – Heavy Components Offload, Transport, and haul routes **Change/Rev.:** 0

System Designator(s)/Description: YARD

Description of Proposed Change

ER-ANO-2002-1078-009, "ANO-1 SG/RVCH Replacement – Heavy Components Offload, Transport, and haul routes" performs the design and programs the implementation activities associated with the following:

1. Evaluation and testing of the haul route(s) to be used for the following transport activities:
   (a) Offload of the barge and delivery of the ANO Unit 1 Replacement Once-Through Steam Generators (ROTSGs) from the barge delivery area and transport of these components to the ROTSG preparation location. This location will be at a temporary ROTSG preparation area as specified in ERCN-1 of this ER. Construction of the Unit 1 OSGSF will be implemented under ER-ANO-2002-1078-006, "ANO-1 SG/RVCH Replacement – Original OTSG & RVCH Storage Facility." ERCN-1 of this ER will address the use of the temporary ROTSG preparation area including off-load and loading of the transporters.
   (b) Transport of the OOTSGs and ORVCH/OSS (following their separate removal from the Unit 1 Reactor Building) to the ANO-1 OSGSF, where they will be placed for storage. Rigging and handling of these items from the Reactor Building Opening created by ER-ANO-2002-1078-007, "ANO-1 SG/RVCH Replacement – Reactor Building Opening" to the ground level and the awaiting transporter will be implemented by ER-ANO-2002-1078-010, "ANO-1 SG/RVCH Replacement – Heavy Components Rigging and Handling Outside Reactor Building." Rigging of the OVCH/OSS at the OSGSF is included in the scope of ER-ANO-2002-1078-009.
   (c) Transport of the ROTSGs from the ROTSG temporary preparation area to the Unit 1 Reactor Building for ROTSG rigging and handling into the Reactor Building via the Reactor Building Opening under the implementation of ER-ANO-2002-1078-010.
   (d) Transport of the Replacement RVCH (RRVCH) and its attached Replacement Service Structure (RSS) from the RRVCH/RSS Temporary Assembly Building (TAB) located north of Unit 2 (near the Unit 2 OSGSF) to the Unit 1 Reactor Building for its rigging and handling into the Reactor Building via the Reactor Building Opening under the implementation of ER-ANO-2002-1078-010.
2. Necessary preparation of the ROTSG/OOTSG/ORVCH/RRVCH haul routes as evaluated in Calculation ANO-ER-04-030, ANO-1 SG/RVCH Replacement Haul Path Analysis, to:
   (a) Enable proper and unobstructed component transport utilizing a self-propelled modular transporter (SPMT), and
   (b) Provide suitable component haul route temporary protective measures as required (e.g., additional surface fill material/gravel, ground mats, weight-distributing steel plates, etc.), which along with the soil depth location and other characteristics of piping/conduits beneath the haul route, will be sufficient to preclude any potential damage from the effects of the maximum expected transporter loadings.
3. Evaluation of the transporter(s) for appropriateness and failsafe characteristics in navigating and maneuvering along the designated haul routes for the transport activities described in Item (1), above.
4. Evaluation for appropriateness of other rigging and handling equipment used to perform component offload/onload activities outside the Unit 1 Reactor Building, which are not included in the scope of ER-ANO-2002-1078-010, "Heavy Components Rigging and Handling Outside Reactor Building." Proceeding from these evaluations are the specific implementation instructions for performing these rigging and handling operations.

5. Upgrades to the barge docking area which may be necessary to enable the ROTSGs to be delivered successfully by barge. These upgrades include initial installation/marking of the barge delivery channel by buoys prior to delivery of the ROTSGs.

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	**EDITORIAL CHANGE of a Licensing Basis Document**	**Section I**
☐	**SCREENING**	**Sections I and II required**
☐	**50.59 EVALUATION EXEMPTION** FFN 05-004 3/3/05	**Sections I, II, and III required**
☒	**50.59 EVALUATION (#:** ~~FSN 05-004~~ **)**	**Sections I, II, and IV required**

Preparer: Wayne R Wasser/ [signature] /Adecco Tech./SGRP Eng./2-16-05
Name (print) / Signature / Company / Department / Date

Reviewer: Doyle G Adams/ [signature] /EOI/SGRP Eng./ 2/21/05
Name (print) / Signature / Company / Department / Date

OSRC: J.R. Eichenberger/ [signature] / 3/3/05
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings (see Section 5.8) and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	☐	☒	
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	☒	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	☒	
If "YES", perform an Exemption Review per Section III OR perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. AND initiate an LBD change in accordance with NMM LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2, 3]	☐	☒	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculations Manual[3, 4]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM LI-113. No further 50.59 review is required.			

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

2. Does the proposed activity involve a test or experiment not described in the FSAR? ☐ Yes ☒ No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. Basis

Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Discuss other LBDs if impacted. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis. See EOI 50.59 Guidelines Section 5.3.2 for guidance.

Basis for Section II.A.1:

The design and implementation activities of ER-ANO-2002-1078-009 to support the changeout of the ORVCH/OSS and OOTSGs for ANO Unit 1 themselves fully comply with the ANO Unit 1 and Unit 2 Operating License, Technical Specifications, and NRC Orders, and therefore has no impact to these Licensing Basis Documents. The movement of the OTSGs and RVCHs using the self-propelled modular transporter (SPMT) will use existing site roads and access points that are shown on site drawings and FSAR figures. The evaluated haul routes for the ROTSGs, OOTSGs, ORVCH/OSS and RRVCH/RSS, and their associated transport activities are designed to have no detrimental actual or potential effect upon any plant structures, systems, or components (SSCs), and will thus result in no required changes to the FSAR, Technical Specifications Bases, and Technical Requirements Manual. The locations and characteristics of the underground SSCs contained in the haul routes, along with the analysis performed to acceptably conclude that the SPMT loadings upon these traversed underground SSCs are contained within ER-ANO-2002-1078-009 and ANO Calculation No. ANO-ER-04-030, "ANO-1 SGR/RVCH Replacement – Haul Path Analysis." No above-ground SSCs are impacted through ER-ANO-2002-1078-009 transport activities described in the Description of Proposed Change of this 10 CFR 50.59 Review (Item 1, a-e). The following is a listing of the haul routes' identified underground SSCs, which have Technical Specification, FSAR, and other licensing bases associations:

- Four (4) Emergency Diesel Generator (EDG) Diesel Fuel Oil 2" pipes (Two (2) HBD-11, 2HBD-103, and 2HBD-104)
- One (1) 24" x 18" Electrical Duct Bank to MH10
- One (1) 26" x 18.5" Electrical Duct Bank (Crosses SW-NE Access Rd.)
- One (1) 52" x 31" Electrical Duct Bank from 2MH12 (Station Blackout-Associated)
- One(1) 18" Service Water System (SWS) pipe (HBD-13)
- One (1) 30" Service Water pipe (SWS) (2HBC-83)
- One (1) 36" Service Water pipe (SWS) (HBD-12)
- One (1) 42" Service Water pipe (SWS) (2HBC-88)
- One (1) 24" Circulation Water pipe (2HBD-23)
- Two (2) 132" Circulation Water pipes (North and South pipes) (2JF-1, 2JF-3)
- Two (2) 12" Fire Water pipes (KE-1 and KE-2), and one (1) 8" Fire Water pipe (NW-SE to SALLY PORT)

As documented in ANO Calculation No. ANO-ER-04-030, temporary protective measures are provided as required (e.g., additional surface fill material/gravel, ground mats, weight-distributing plates, etc.), which along with the soil depth location and other characteristics of piping/conduits beneath the haul route, will be sufficient to preclude any potential damage from the effects of the maximum expected transporter loadings.

The stability of the SPMT for all potential evaluated transport configurations and environmental conditions (including seismic conditions with a loaded transporter) is acceptably demonstrated in SGT Calculation Nos. 0010000835-NL02-D-C-021, "Stability Check for ROTSG Transport," 0010000835-NL02-D-C-022, "Stability Check for OOTSG Transport," and 0010000835-NL02-D-C-023, "Stability Check for ORVCH Transport." Further, the SPMT equipment is designed with failsafe features that place the transported component in a stable configuration in the unlikely event of SPMT hydraulic power loss, or loss of control due to equipment failure. The SPMT will be operated at all times by its supplier/vendor – Mammoet, by its own specially-trained personnel, and while the SPMT is normally controlled by one operator, other Mammoet staff will be present to assist in the event of operator incapacitation. Therefore, the transport configuration and the design and operational reliability of the transporter equipment as evaluated within ER-ANO-2002-1078-009 preclude any possibility of transporter rollover or component slide-off.

Transport of these components is mutually exclusive and independent of the Core Operating Limits Report. No citation was discovered from the search of NRC Safety Evaluation Reports which would be in conflict with for ER-ANO-2002-1078-009 implementation.

Transport of the RRVCH/RSS and ROTSGs is performed in a manner that maintains the quality and integrity of these components. For the ORVCH/OSS and OOTSGs, which are classified as radiologically contaminated equipment, pre-transport measures are taken to confine and control any potential environmental release. Onsite rigging, handling, and transport will maintain the manufacturer requirements for handling the RRVCH/RSS and ROTSGs. Thus, ER-ANO-2002-1078-009 complies with the ANO Quality Assurance Program Manual.

With regard to the ANO Site Emergency Plan, SGT will comply with site procedures and administrative requirements associated with Emergency Plan implementation (e.g., informational training of SGT personnel for site assembly events, site evacuation, etc.). The ANO Site Emergency Plan involves various site equipment and facility availabilities for its proper execution. A manual review of the ANO Site Emergency Plan concluded that no adverse effects are expected from the design and implementation of ER-ANO-2002-1078-009. However, since the potential exists that one of the emergency access routes could be blocked by the transport, this ER will avoid impact to the Emergency Plan by active communications with the Control Rooms and placing "spotters" with the transporter. The spotters function would be to reroute traffic where the transporter was actually blocking traffic (along with provisions for rerouting traffic). Active communications with the Control Room will be in place to notify the Installation Team of any Notification Event, whereby the Team could suspend transport. The fire protection system as described in the Emergency Plan and ANO Fire Protection Program (including the Fire Hazards Analysis) is not impaired through the ER-ANO-2002-1078-009 scope of RRVCH/RSS onsite transport.

As respective parts of ER-ANO-2002-1078-017, "RVCH Shielding;" and ER-ANO-2002-1078-015, "OTSG Prep, RCS Piping and Supports," the ORVCH/OSS and the OOTSGs are prepared to confine/encapsulate/affix any contained/adhered radiological contamination in accordance with site radiation/radwaste control requirements prior to these components exiting the Reactor Building for outside rigging, handling and transport.

As part of ER-ANO-2002-1078-009, a radiation dose analysis (ANO Calculation ANO-ER-04-007) was performed to evaluate the postulated radiological release for SGR/RVCH Replacement Project activities. Although this calculation would similarly bound the radiological results of any adverse event occurring during ORVCH/OSS and OOTSG transport, such events are deemed not credible due to the design of the transport equipment and transport operation, which maintains the OOTSGs and ORVCH/OSS at a low elevation (approximately 6 feet from ground level) and appropriately braced and secured during its their transport. SPMT stability calculations are performed as cited above in SGT Calculation Nos. 0010000835-NL02-D-C-021, 0010000835-NL02-D-C-022, and 0010000835-NL02-D-C-023.

However, as part of this 10 CFR 50.59 Review, a 10 CFR 50.59 Evaluation is performed to consider the potential impact of buried safety related systems and components that the loaded SPMT will be transported over.

Basis for Section II.A.2:

In determining whether steam generator and RVCH component transport activities involve tests or experiments not described in the UFSAR, the applicable section of NEI 96-07, Revision 1, Guidelines for 10 CFR 50.59 Implementation, was consulted. Section 3.14 of NEI 96-07 describes the intent of defining tests not described in the UFSAR as being to ensure that tests or experiments that put the facility in a situation that has not previously been evaluated (e.g., unanalyzed system alignment) or could affect the capability of SSCs to perform their intended design functions (e.g., high flow rates, high temperatures) are evaluated before they are conducted to determine if prior NRC approval is required. Although use of the haul route for steam generator and RVCH component transport will involve traversing over underground safety related structures, systems, and components (SSCs), the evaluations of the SPMT in SGT Calculation Nos. 0010000835-NL02-D-C-021, 0010000835-NL02-D-C-022, and 0010000835-NL02-D-C-023, demonstrate that catastrophic failures (i.e., SG/RVCH transporter and SG/RVCH rollover, SG/RVCH slideoff) are not credible. The haul route has been evaluated for the maximum loaded transporter, and temporary upgrades will be performed on the route to provide any necessary protection of underground SSCs from expected loadings. Given these design and equipment performance measures, it is therefore concluded that use of the haul route will not involve a test or experiment not described in the UFSAR.

Background Information for Answers to Section II.B, Environmental Screening:

The Environmental Screening contained in Section II.B of this 50.59 Review yielded positive responses for Items 1 (Land Disturbances of Previously Disturbed Land Areas), 3 (Conducting Dredging Activities), 9 (New Water Discharge Path), 11 (Air Quality Effects due to Hydrocarbon Burning), 13 (Installation/Modification of Stationary/Mobile Tank), 14 (Use of Oils/Chemicals), and 15 (Burial/Placement of Any Solid Wastes Onsite Affecting Runoff/Surface Water/Groundwater). Accordingly, an Environmental Review will be prepared by ANO Chemistry/Environmental Staff to address these issues. For background purposes, the following information is presented:

- Item 1 – (Land Disturbances of Previously Disturbed Land Areas) – The potential exists for a > 1 acre (of previously disturbed land area) scope of grading and other route preparation activities in order to provide haul route protection of buried piping/conduit and/or ensure route usability. Large expanses of SB-2/Class 7 will be required to be soaked with water or a palliative agent to mitigate dust due to the impact of transport activities on adjacent areas, including warehouse storage.
- Item 3 – (Conducting Dredging Activities) – Any dredging necessary to permit barge ROTSG delivery barge docking/unloading will comply with the applicable environmental requirements. Installation/marking of the barge delivery channel by buoys to enable barge docking will meet U.S. Coast Guard requirements for these navigational aids. Depending on the permit requirements from the Corps of Engineers, the dredging effluent may be left in the lake away from the shipping channel or may be removed. If removal of dredging effluent is required by the Corps of Engineers permit, dredging activities will require the building and use of silting ponds for the dredging effluent. Such support activities will result in positive response to Items 9 (result in a new water discharge path), 13 (involve the installation or modification of a stationary or mobile tank), and 15 (involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater). Installation and use of silting ponds will adhere to environmental standards for the same.
- Item 11 – (Air Quality Effects due to Hydrocarbon Burning) – Onsite transport of the steam generator and RVCH components involves diesel-powered equipment (self-propelled transporter and heavy rigging/handling equipment). However, temporary construction aid equipment of this type is not applicable to the environmental issue of air quality effects per EN-S NMM Procedure EV-117. As a matter of good project practice, no open burning will be permitted as part of project operations.
- Item 14 – (Use of Oils/Chemicals) – Onsite transport of the steam generator and RVCH components involves equipment that utilizes oils (hydraulic, lubricating, diesel fuel) in small amounts, as compared to the large tank storage amounts of oils/chemicals that the Item 14 question was intended to address. As a matter of good project practice, proper maintenance and frequent inspection of this equipment throughout onsite use are performed. As a responsible operator of such equipment, SGT will have in place contingency response plans to deal environmentally with any unanticipated leakage. Onsite project storage and use of chemicals will comply with ANO site requirements for the same.

4. References

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.4.1[5]](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

Using the Autonomy LRS 50.59 – Common Database, the keyword search defined below in Note 1 was performed. Keywords used are shown to the right. The LBDs identified by the search hits were unaffected by the scope of ER-ANO-2002-1078-009. Information resulting from these searches was used to prepare this 50.59 Review.

Keywords, as adapted:

Head (used for Reactor Vessel Closure Head), RVCH

Structure (used for Service Structure)

"Steam Generator", "Steam Generators", SG, OTSG

Transport* (to capture transport, transporter, and other derivatives)

"Prime Mover"

Road* (to capture road, roadway, and other derivatives)

"haul route"

Diesel

Fuel

Buried

Underground

Utilities

"duct bank", "duct banks"

"Alternate AC", AAC

"Fire water", firewater

"Emergency Cooling Pond", ECP

Rigging

Dredg*

Barge

Evacuation NEAR10 Route*

Note 1: Boolean operators were used to refine the search method with the purpose of obtaining document hits pertinent to the subject matter of ER-ANO-2002-1078-009. All hits occurring within the LBDs that had hits were investigated for potential effects the scope of ER-ANO-2002-1078-009 could have on these LBDs.

1. (1A) (head OR "RVCH") NEAR10 transport*, (1B) - NEAR10 "prime mover", (1C) - NEAR10 road*, (1D) - NEAR10 "haul route", (1E) - NEAR10 buried, (1F) - NEAR10 underground, (1G) - NEAR10 utilities, (1H) - NEAR10 ("duct bank" OR "duct banks"), (1I) - NEAR10 ("alternate AC" OR "AAC"), (1J) - NEAR10 ("fire water" OR firewater), (1K) - NEAR10 ("emergency cooling pond" OR "ECP").

2. (2A) structure NEAR10 transport*, (2B) - NEAR10 "prime mover", (2C) - NEAR10 road*, (2D) - NEAR10 "haul route", (2E) - NEAR10 buried, (2F) - NEAR10 underground, (2G) - NEAR10 utilities, (2H) - NEAR10 ("duct bank" OR "duct banks"), (2I) - NEAR10 ("alternate AC" OR "AAC"), (2J) - NEAR10 ("fire water" OR firewater), (2K) - NEAR10 ("emergency cooling pond" OR "ECP").

3. (3A) ("steam generator" OR "steam generators" OR "OTSG" OR "SG") NEAR10 transport*, (3B) - NEAR10 "prime mover", (3C) - NEAR10 road*, (3D) - NEAR10 "haul route", (3E) - NEAR10 buried, (3F) - NEAR10 underground, (3G) - NEAR10 utilities, (3H) - NEAR10 duct bank*, (3I) - NEAR10 ("alternate AC" OR "AAC"), (3J) - NEAR10 ("fire water" OR firewater), (3K) - NEAR10 ("emergency cooling pond" OR "ECP"), (3L) - NEAR10 "heavy rigging".

4. (4A) transport* NEAR10 transporter, (4B) - NEAR10 "prime mover", (4C) - NEAR10 road*, (4D) - NEAR10 "haul route", (4E) - NEAR10 diesel, (4F) - NEAR10 fuel, (4G) - NEAR10 buried, (4H) - NEAR10 underground, (4I) - NEAR10 utilities, (4J) - NEAR10 ("duct bank" OR "duct banks"), (4K) - NEAR10 ("alternate AC" OR "AAC"), (4L) - NEAR10 ("fire water" OR firewater), (4M) - NEAR10 ("emergency cooling pond" OR "ECP").

5. (5A) "prime mover" NEAR10 road*, (5B) - NEAR10 "haul route", (5C) - NEAR10 diesel, (5D) - NEAR10 fuel, (5E) - NEAR10 buried, (5F) - NEAR10 underground, (5G) - NEAR10 utilities, (5H) - NEAR10 ("duct bank" OR "duct banks"), (5I) - NEAR10 ("alternate AC" OR "AAC"), (5J) - NEAR10 ("fire water" OR firewater), (5K) - NEAR10 ("emergency cooling pond" OR "ECP").

6. (6A) Dredg* OR Barge.

7. (7A) rigging

8. (8A) evacuation NEAR10 route*

LBDs/Documents reviewed manually:

1. ANO Unit 1 Final Safety Analysis Report (Revision 19, October 2004), Sections 4.2.2.1, 4.2.2.2, 4.3.3, 4.3.4, 8.3, 9.3.1, 9.3.2, 9.3.4, 9.8.3, 11.1.4, 11.2, 11.3, and 14. Figures 4-2, 4-3, 4-4, 4-5, 4-12, 4-15, 9-15. Table 14-1.

2. ANO Unit 2 Final Safety Analysis Report, Sections 2.1.2, 8.3.1, 9.2.1, 9A, 9D, 11.5, and 15.1. Figures 2.5-17, 2.5-21, 9.2-8, 11.3-2

3. Arkansas Nuclear One Emergency Plan, Revision 31, Sections B.2, J.1, Figure J-4.

5. **Is the validity of this Review dependent on any other change?** (See Section 5.3.4 of the EOI 10 CFR 50.59 Program Review Guidelines.)

☐ Yes

☒ No

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☒	☐	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☒	☐	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☒	☐	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☒	☐	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☒	☐	Involve the installation or modification of a stationary or mobile tank?
14.	☒	☐	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☒	☐	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☒	☐	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☒	☐	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

The Security Plan Screening contained in Section II.C of this 50.59 Review yielded positive responses for Items 2 (Breach of Security Barrier), 3 (Placement of Materials/Equipment within Security Isolation Zone), and 9 (Security-Related Signage or Land Vehicle Barriers). Accordingly, a Security Plan review will be performed by the Security Department to address these issues. For background purposes, the following information is presented:

- Item 2 – (Breach of Security Barrier) – Dependent on geometries of the ROTSGs and SPMT, specific temporary provisions to the Security Isolation Zone security fence equipment access portals may be required to allow transit of these items to onsite areas. Such activities will be pre-approved by the Security Department and be in compliance with governing plant security procedures.
- Item 3 – (Placement of Materials/Equipment within Security Isolation Zone) – Mats or equivalent ground surface supports may be placed through the Sally Port in preparation for ROTSG transport to plant areas. Use of these items within the Security Isolation Zone will be approved by the Security Department.
- Item 9 – (Security-Related Signage or Land Vehicle Barriers) – Use of the haul route for onsite delivery/transport of the ROTSGs will involve temporary changes to the configurations of the site's vehicle barrier system in order to provide the access needed to accomplish onsite delivery and transport of these large items. Such activities will be pre-approved by the Security Department and be in compliance with governing plant security procedures.

Security Plan Review:

The ANO-1 SG/RVCH Replacement project will have an impact on security operations but will not prompt a change to the ANO Physical Security, Safeguards Contingency, and Training and Qualification Plan. With regard to Items 2, 3, and 9, the alterations to security barriers and/or isolation zones will be temporary and during such time, appropriate security compensatory measures will be implemented. Coordination with the security department will be critical during the planning and execution stages of this project. The security department will need to perform walk-downs of any proposed barrier or isolation zone modifications so that an appropriate plan for compensatory measures can be developed. Should the proposed haul route require the temporary removal of portions of the vehicle barrier system (concrete blocks), compensatory measures can be established; however, for security reasons, the blocks need to be returned to the original configuration as soon as possible following movement of any vehicle through the area. Appropriate equipment for moving the concrete blocks should be staged and readily available for block repositioning.

Kenneth D. Jeffery, Supervisor, Security Operations, x-3511

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	☒	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	☒	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	☒	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	☒	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	☒	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	☒	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	☒	Involve a change to the Fuel Building electrical power?
9.	☐	☒	Involve a change to the Fuel Building ventilation?
10.	☐	☒	Involve a change to the ISFSI security?
11.	☐	☒	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	☒	Involve a change to spent fuel characteristics?
13.	☐	☒	Redefine/change heavy load pathways?
14.	☐	☒	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	☒	Involve a change to the loading bay or supporting components?
16.	☐	☒	New structures near the ISFSI?
17.	☐	☒	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	☒	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

III. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A.1, above.

A. Check the applicable boxes below. If any of the boxes are checked, clearly document the basis in Section II.B, below. If none of the boxes are appropriate, perform a 50.59 Evaluation in accordance with Section IV. Provide supporting documentation or references as appropriate.

☐ The proposed activity meets all of the following criteria regarding design function per Section 5.5[1](a):

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of evaluation that demonstrates intended design function(s) of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed activity already exists per Section 5.5[1](b). Reference 50.59 Evaluation # _____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

☐ The NRC has approved the proposed activity or portions thereof per Section 5.5[1](c). Reference: _____

B. Basis

Provide a clear, concise basis for determining the proposed activity may be exempted such that a third-party reviewer can reach the same conclusions. See Section 5.6.6 of the EOI 10 CFR 50.59 Review Program Guidelines for guidance.

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes ☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

Possible effects of the maximum expected transporter loadings during transport of the OTSGs and the RVCHs are not analyzed in the FSAR. Therefore, implementation of ER-ANO-2002-1078-009 will not result in an increase in the frequency of occurrence of an accident previously evaluated in the FSAR.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

All SSCs important to safety that are affected by the activities described in ER-ANO-2002-1078-009 have been evaluated in Calculation ANO-ER-04-030. The results of this calculation show that all loads to SSCs are within code limits and are therefore acceptable. Additionally, SGT Calculations 0010000835-NL02-D-C-021, 0010000835-NL02-D-C-022, and 0010000835-NL02-D-C-023 demonstrate that the OTSGs and the RVCHs will remain on the transporter even during a design basis seismic event. Therefore, there is no more than a minimal increase in the likelihood of occurrence of a malfunction of a SSC important to safety that was previously evaluated in the FSAR.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The only possible increase in consequence of an accident in the FSAR that could be affected by ER-ANO-2002-1078-009 is a seismic event. However SGT Calculations 0010000835-NL02-D-C-021, 0010000835-NL02-D-C-022, and 0010000835-NL02-D-C-023) demonstrate that the OTSGs and the RVCHs will remain on top of the transporter during a seismic event. The calculations thoroughly evaluate the self-propelled modular transporters (SPMTs) to ensure that the components do not roll off of slide off of the transporter. Therefore, there is no more than a minimal increase in the consequences of an accident previously evaluated in the FSAR.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

There are no changes to the malfunction consequences of underground SSCs over which the loaded SPMT traverses along the evaluated haul routes. The likelihood of any failures of these underground SSCs and the consequences of such failures are not affected by the transport activities evaluated in and implemented by ER-ANO-2002-1078-009. This conclusion is reached by the haul route evaluation performed in ANO Calculation ANO-ER-04-030, which demonstrated that sufficient protection from SPMT wheel loads during SG/RVCH transport will exist. Loadings to the haul route and underground SSCs from SPMT failures (SPMT and SG/RVCH rollover, SG/RVCH slideoff) are precluded by use of specialized self-propelled modular transporter and the inherent stability of the same during the SG/RVCH transport activities as concluded in SGT Calculation Nos. 0010000835-NL02-D-C-021, 0010000835-NL02-D-C-022, and 0010000835-NL02-D-C-023. Underground SSCs of the evaluated haul routes therefore will remain intact and fully capable of performing their accident mitigation functions during FSAR-evaluated accidents. Accordingly, implementation of ER-ANO-2002-1078-009 does not result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The SPMT to be used to transport the steam generator and RVCH components for the Unit 1 SGR/RVCH Replacement Project has inherent and demonstrated stability for all potential evaluated transport configurations and environmental conditions, including seismic conditions with a loaded transporter (References - SGT Calculation Nos. 0010000835-NL02-D-C-021, 0010000835-NL02-D-C-022, and 0010000835-NL02-D-C-023. Further, the SPMT equipment is designed with failsafe features that place the transported component in a stable configuration in the unlikely event of SPMT hydraulic power loss, or loss of control due to equipment failure. The SPMT will be operated at all times by its supplier/vendor - Mammoet, by its own specially-trained personnel, which includes for each transport evolution an operator and assistant. These equipment design and operational features preclude the types of failures (SG/RVCH transporter and SG/RVCH rollover, SG/RVCH slideoff).

As part of ER-ANO-2002-1078-009, a radiation dose analysis (ANO Calculation ANO-ER-04-007) was performed to evaluate the postulated radiological release for SGR/RVCH Replacement Project activities. Although this calculation would similarly bound the radiological results of any adverse event occurring during ORVCH/OSS and OOTSG transport, from the above discussion, such during transport events (SPMT and OOTSG/ORVCH rollover, OOTSG/ORVCH slideoff) are deemed not credible. In comparative terms to FSAR described accidents, the results of the postulated drop of an OOTSG/ORVCH/OSS as evaluated in ANO Calculation ANO-ER-04-007 are well within the regulatory requirements for offsite dose to the public at the Exclusion Area Boundary (EAB) and for dose to the control room operators. Further, since these dose values are only a fraction of the dose acceptance values for a Waste Gas Tank Rupture (Reference: Unit 1 UFSAR Section 14.2.2.7 and Unit 2 UFSAR Section 15.1.16) of the 0.5 Rem total body exposure during a 2-hour period at the EAB, no new accident not described in the FSAR is created, and as a result do not create the possibility for an accident of a different type than any previously evaluated in the FSAR.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The haul route evaluation performed by ANO Calculation ANO-ER-04-030 demonstrates that with expected wheel loadings of the loaded SPMT, the structural intactness of the buried SSCs tranversed during SG/RVCH transport will be maintained. Since SGT Calculation Nos. 0010000835-NL02-D-C-021, 0010000835-NL02-D-C-022, and 0010000835-NL02-D-C-023 demonstrate SPMT stability for all potential evaluated transport configurations and environmental conditions, including seismic conditions with a loaded transporter, no credible damage or malfunction will result through SG/RVCH transport to any underground SSCs along the evaluated haul route. These SSCs remain intact and fully capable of performing their accident mitigation functions during FSAR-evaluated accidents. No above ground SSCs are affected through the performance of ER-ANO--2002-1078-009 transport activities. Accordingly, implementation of ER-ANO-2002-1078-009 does not create the possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

The transport of the ROTSGs, OOTSGs, ORVCH, and RRVCH take place in the yard and will have no impact on any of the fission product barriers as described in the FSAR.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

The transport of the ROTSGs, OOTSGs, ORVCH, and RRVCH does not result in any changes to methods described in the FSAR.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ENVIRONMENTAL REVIEW FORM (ANO)

1. Document Number: ER-ANO-2002-1078-009, SG/RVCH Replacement – Heavy Components Offload, Transport, and Haul Routes

2. Activity Reviewed: The offload and transport of replacement U-1 steam generators from the barge slip to the staging area

3. Complete Screening Below:

Reference	Within Scope	Modification/Revision/ Approval Needed
NPDES Permit AR0001392	x Yes ☐ No ☐ N/A	☐ Yes x No
Air Permit 0090-AR-3	x Yes ☐ No ☐ N/A	☐ Yes x No
Section 404 Permit 00241-5	☐ Yes ☐ No x N/A	☐ Yes ☐ No
1052.030, ANO SPCC Plan	☐ Yes ☐ No x N/A	☐ Yes ☐ No
ANO Stormwater Plan	x Yes ☐ No ☐ N/A	☐ Yes x No
References 2.1.1 – 2.1.4	☐ Yes ☐ No x N/A	
References 2.2.1 – 2.2.5	x Yes ☐ No ☐ N/A	☐ Yes ☐ No
ANO-1 FES	☐ Yes ☐ No x N/A	
ANO-2 FES	☐ Yes ☐ No x N/A	
ANO-1 GEIS – Supplement 3	☐ Yes ☐ No x N/A	
References 2.4.4 – 2.4.7	☐ Yes ☐ No x N/A	
Reference 2.4.16	x Yes ☐ No ☐ N/A	☐ Yes x No
ANO Unit 1 SAR	☐ Yes ☐ No x N/A	☐ Yes ☐ No
ANO Unit 2 SAR	☐ Yes ☐ No x N/A	☐ Yes ☐ No

4. If within scope, attach reference(s) and appropriate section(s) or brief discussion: **See attached**

5. If a modification, revision or approval is needed, attach a brief discussion: **See Attached**

6. Prepared By: Dennis Calloway Date: 02/11/05

ENVIRONMENTAL REVIEW FORM (ANO) continued

DOCUMENT NUMBER: ER-ANO-2002-1078-009, ANO-1 SG/RVCH Replacement- Heavy components Offload, Transport, and Haul Routes

ACTIVITEY REVIEWED: The offload and transport of replacement U-1 steam generators from the barge unloading area to the staging area to the U-1 reactor building.

4. WITHIN SCOPE REFERENCES:

NPDES Permit/Reference 2.2.4 (Clean Water Act):

- In accordance with the requirements of the station NPDES Permit, land disturbances greater than 1 acre (for a single project scope) will require the formulation of a Stormwater Pollution Prevention Plan for Construction (SWPPP) prior to construction activities beginning. Notify Chemistry if land disturbing activities will be greater than 1 acre for the formulation of a SWPPP for Construction for this activity. Also include a drawing indicating the areas on ANO that will be affected. Best Management practices identified in the 50.59 Environmental Check list question 9.0 below would be incorporated into any SWPPP developed for this project. For land disturbances less than 1 acre, ANO encourages the use of best management practices to reduce erosion and stormwater runoff. Chemistry will assist in identifying best management practices to use.
- As specified in the 50.59 small quantities (> 55 gallons) of oils and chemicals will be used. These levels are below the level of concern requiring the use of secondary containments. The SWPPP specifies that equipment be monitored for leak and corrective actions taken.

Air permit/Reference 2.2.3 (Clean Air Act):

- The use of temporary portable diesel emission sources does not require any additional monitoring or modifications to the site Air Permit.

Reference 2.2.2 National Historic Preservation Act; Reference 2.4.16 "ANO Historic and Archaeological Preservation Program": The activities associated with this ER do not involve land disturbances outside those areas already disturbed. These references do not apply to this activity.

5. APPROVALS NEEDED:

- ***Potential*** Discharge Canal dredging activities; any dredging activities in the discharge canal require prior authorization through the Corps of Engineers (Department of the Army). This authorization comes in the form of a Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act dredging permit. In the event the discharge canal requires a modification to accept the Unit 1 replacement Steam Generators, an approved dredging permit will be required prior to any dredging activities begin.

Activities checked YES on the 50.59 Environmental Check list not requiring review under this procedure.

9.0 Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge.

This question was answered YES because of the issue of using water as a dust control agent. This activity does not constitute a new discharge point but would be controlled through proper Stormwater Pollution Prevention techniques. The environmental recommendation for this activity is to not over water an area as to cause media erosion (gravel or soil) or a stream of water to enter a stormwater pathway and flow offsite. Control the volume of water used to avoid any adverse environmental impact.

13.0 Involve the installation or use of a stationary or mobile tank.

This question was answered YES because of a temporary portable water tank used in dust control. A water tank is outside the regulatory review criteria.

14.0 Involve the use or storage of oils or chemicals that could be directly released into the environment?

This question was answered YES to identify the use of various hydraulic fluids, lubricating fluids and diesel fuel used during this process. A review of these items identified the quantities as small amounts (less than 55 gallons in storage). These levels are below the criteria for review and do not require the use of secondary containment. The ANO Stormwater Pollution Prevention Plan specifies that equipment leaks and spills will be cleaned up and corrected.

ANO 50.59 Evaluation Number

2005-006

I. OVERVIEW / SIGNATURES

Facility: ANO-2

Document Reviewed: A2-NE-2004-00~~1~~0, "ANO-2 Cycle 18 Final Reload Analysis Report"

Change/Rev.: 0 RWC 3/21/05

System Designator(s)/Description: REAN

Description of Proposed Change:

The engineering report documents the evaluation of the design and performance of the ANO-2 Cycle 18 reload core. The 84 fresh assemblies use zirconium diboride in place of erbia as the integral fuel burnable absorber (IFBA). All the fresh assemblies will utilize ZIRLO fuel rod cladding material. The computer codes used to analyze the physics of the core design has changed to ANC / PARAGON. All analyses and assessments were performed using NRC approved methodologies. There are no Technical Specification changes required to support the Cycle 18 core other than TS 6.9.5, Core Operating Limits Report. This Technical Specification lists the approved methodologies that are used to develop the COLR. This listing was changed to add the topicals for IFBA, ZIRLO and ANC / PARAGON. The COLR itself will be revised for Cycle 18; however, these changes will be addressed in a separate 50.59 evaluation.

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	**EDITORIAL CHANGE of a Licensing Basis Document**	**Section I**
☐	**SCREENING**	**Sections I and II required**
☐	**50.59 EVALUATION EXEMPTION**	**Sections I, II, and III required**
X	**50.59 EVALUATION (#: FFN-05-006)**	**Sections I, II, and IV required**

Preparer: Robert W. Clark / [signature] / ENS / Safety Analysis / 03/10/05
Name (print) / Signature / Company / Department / Date

Reviewer: James H. Willoughby / [signature] / ENS / PWR Fuel Engineering / 03/10/05
Name (print) / Signature / Company / Department / Date

OSRC: John R. Eichenberger / [signature] / 3-17-05
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	X	
TS	☐	X	
NRC Orders	☐	X	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM ENS-LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	X	☐	Chapters 4, 6, and 15
TS Bases	☐	X	
Technical Requirements Manual	☐	X	
Core Operating Limits Report	X	☐	Entire document
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	X	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	X	
If "YES", perform an Exemption Review per Section III OR perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. AND initiate an LBD change in accordance with NMM ENS-LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	X	
Emergency Plan[2, 3]	☐	X	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	X	
Offsite Dose Calculations Manual[3, 4]	☐	X	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM ENS-LI-113. No further 50.59 review is required.			

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

2. **Does the proposed activity involve a test or experiment not described in the FSAR?** ☐ Yes X No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. **Basis**

Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Discuss other LBDs if impacted. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis.

BACKGROUND

The purpose of the Cycle 18 reload analysis report is to document the analyses and assessments performed to demonstrate the acceptable operation of the Cycle 18 core design. The major considerations of the evaluation of the design and performance of the Cycle 18 core were the Cycle 18 specific reload core characteristics and changes in the reload safety analysis groundrules.

A number of fuel and core design changes for Cycle 18 were made. These changes are listed here.

- The reload batch size will be 84 assemblies, which is 4 assemblies less than in Cycle 17.
- A zirconium diboride (ZrB_2) coating will be used as the integral burnable absorber material, as opposed to erbia in Cycle 17.
- Fuel cladding was changed from OPTIN (used in Cycle 17) to ZIRLO.
- Initial fuel enrichments for Batch X are 3.81 and 4.21 weight percent U–235.
- Several minor changes to the fuel mechanical design were made. These changes have negligible impact on core neutronics and fuel management.
- Westinghouse performed their reload analyses using the Westinghouse code neutronics package (PARAGON and ANC). DIT/ROCS (ABB-CE codes) were used in previous cycles.

The Cycle 18 core consists of 84 fresh batch X assemblies and 93 previously irradiated assemblies from fuel batches U (5 assemblies with 1 being a reinsert from Cycle 16), and W (88 assemblies) which are used in a "very low leakage" fuel management scheme. The Cycle 18 reload fuel enrichment and batch size have been selected to achieve a nominal energy of 518 EPFD @ 20 ppm boron based on Cycle 17 energy of 500 EFPD. This reload configuration has been evaluated for impacts on the fluence assumptions used in the reactor vessel analyses for the heat up and cooldown limits. The Cycle 18 core design does not invalidate any of the assumptions used in those analyses; therefore those limits remain valid.

Batch X is the first ANO-2 cycle to employ ZrB_2 as an integral poison. The design employs a fixed poison concentration for all bundles but varies the number of fuel pins that contain ZrB_2 from 24 to 124 per bundle. The number of pins containing ZrB_2 has been selected to provide sufficient reactivity hold down while maintaining power distribution controls. The use of ZrB_2 as a poison caused the critical boron concentration to increase during the first approximately 100 EFPD of the cycle. After that point a negative slope over the balance of the cycle occurs. This characteristic will ensure that the boron concentration can be changed in a predictable manner over the cycle to offset the effects of fuel depletion.

ZrB_2 has been widely used at other reactors including Fort Calhoun and Indian Point 2. Westinghouse has evaluated the neutronic performance of ZrB_2 poisoned fuel rods. That evaluation is described in their topical report WCAP-16072-P-A, which demonstrated that the accuracy of their physics analysis methods is not impacted by the introduction of ZrB_2. The NRC approved the application of these methods to CE 16x16 fuel bundles.

Additionally, the Westinghouse topical report evaluated the fuel thermal/mechanical effects of rods containing ZrB_2. This evaluation showed an increase in the internal rod pressure which required a reduction in the internal fill gas pre-pressurization and the use of annular fuel pellets in the cutback regions (top and bottom 8 inches of the fuel that is not coated by ZrB_2).

Critical boron concentrations, due to the hold down effect of ZrB_2, are significantly less at the beginning of the cycle than they were for Cycle 17. Critical boron initially increases for the cycle until reaching a peak boron concentration at approximately 100 EFPD into the cycle.

The HZP MTC will be positive for approximately the first half of Cycle 18. The MTC will initially become more positive until approximately 100 EFPD (when the critical boron reaches its peak) and then decrease and become more negative for the second half of Cycle 18. The MTC will be more positive than the +0.5E-04 $\Delta\rho$ / °F safety analysis limit if all uncertainties are applied and calculated at the minimum allowable criticality temperature of 523 °F when calculated from the design short endpoint burnup of 475 EFPD for Cycle 17. To overcome this, one of two actions is listed as a contingency in Table 6-10 of the Cycle 18 reload report. Either assure shutdown of Cycle 17 does not occur before 477.7 EFPD or increase the minimum allowed temperature for criticality to 524 °F. As of February 22, 2005, Cycle 17 has operated approximately 481 EFPD; therefore the MTC question is no longer an issue for Cycle 18. The existing operating history of Cycle 17 ensures that the Cycle 18 MTC is within Technical Specification and COLR requirements with analysis uncertainties applied at worst case temperature and burnup levels.

The peak pin burnup is well within the licensed limit even with the most limiting Cycle 18 and 17 shutdown assumptions applied.

The impact of the Cycle 18 reload batch on the fuel storage criticality analysis has been assessed. The fuel design assumptions used in that analysis has been confirmed to ensure the requirements of Technical Specification 3.9.12 remain applicable. These assumptions include no credit for poison, a fuel enrichment of less than 4.55 w/o, and application of the fuel loading patterns given in the Technical Specification.

The Cycle 18 reload analysis considers an operating window shown in the following table. Operation is licensed up to the EFPD limits shown in the Table including coastdown.

ALL in EPFD	Maximum Cycle 18 End Point
Cycle 17 Short End Point – 475	556.3
Cycle 17 Long End Point – 510	539.2

From the above table it can be seen that as long as the Cycle 17 shutdown (EFPD) occurs between 475 – 510 EFPD, the results presented in the reload report will remain valid. The core was modeled based on nominal full power operation at a T-inlet of 551 °F and a primary loop flow 105 % of 120.4E+06 lbm/hr. Physics parameters were generated considering a T-inlet range of 540 – 556.7 °F. Neutronic parameters important to safety were generated using NRC approved codes and methods that are appropriate to the Cycle 18 core.

Two major changes were made to the fuel rods manufactured for Batch X. The first was a change in cladding from the OPTIN zirconium alloy to the ZIRLO cladding. ZIRLO is a modification of Zircaloy-4 that includes a reduction in the tin and iron content, elimination of the chromium content and the addition of 1 % niobium. The material properties of ZIRLO and Zircaloy-4 are very similar in the region of interest. The new cladding will provide increased corrosion resistance and may allow a higher peak pin burnup in future cycles. Only the fuel rod cladding was changed to the new alloy and the remainder of the assembly is made from the same materials as previous batches.

The second change to the fuel rod design is replacement of the Erbia integral absorber with a neutron poison using ZrB_2 coated on the outside of the fuel pellets. Westinghouse's IFBA absorber will provide

better fuel enrichment economics and improved boron hold down at the beginning of the cycle. The neutron interaction with the ZrB_2 coating releases helium into the pellet to clad gap. This increased helium production will be offset by a lower helium pre-pressurization and the use of annular fuel pellets at the top and bottom of each IFBA rod.

In the SER for the ZrB_2 topical, the NRC listed a condition in which a cycle-specific calculation shall be used to verify that required power margins in the axial cutback regions are maintained within the safety analysis limits. A Cycle 18 specific calculation was performed to demonstrate this constraint is satisfied for Cycle 18.

These two changes were explicitly modeled in the neutronics and fuel performance models used to evaluate the Cycle 18 design. The evaluations demonstrated that the 16x16 fuel rod designs used in Cycle 18 meet the applicable design criteria for stress, strain, fatigue, and collapse. Adequate shoulder gap will be available for Cycle 18.

There are no major mechanical design changes for the Batch X grid cages. The offset bend along the bottom edge of the Guardian grid was modified to improve the welding characteristics and reduce rework. The debris feature of the Guardian grid (gull wing) now requires height verification by a calibrated gauge.

Several documentation only changes were also made to the design. These are:

- The offset bend along the bottom edge of the GUARDIAN grid perimeter strip was modified to facilitate welding to the lower end fitting and reduce rework.
- The inspection of the grid debris feature (gull wings) of the GUARDIAN grid was modified to require the height of those features be verified with a gauge that requires calibration.
- Guide post drawings were revised to the final after chrome plating dimensions.
- The use of bar stock was allowed for machining guide posts as well as formed blanks.
- The documentation was standardized to the Westinghouse terms verses the CE design terms.
- The specification was updated for the UO_2 pellet re-sintering stability test.
- Loading patterns were developed for the ZrB_2 poison rods in the 16x16 array.

Cycle 17 has shown evidence of a mild crud induced power shift (CIPS) also known as axial offset anomaly (AOA). There are no fuel mechanical design changes available or installed in Batch X to mitigate the localized boiling that leads to AOA.

The identified fuel failures in prior cycles have been inspected and found to be due to grid to rod fretting at mid-grid locations. No design changes have been made to Batch X or the other resident batches that would prevent similar fuel failures for the upcoming cycle.

The results of the thermal-hydraulic analysis for the Cycle 18 core are bounded by the analysis of record (AORs) except for some penalties and some seized rotor data. The more limiting penalties will be incorporated into the transient and setpoint analyses (e.g., COLSS and CPC constants determination) as appropriate. These analyses are currently on-going. By procedure, any changes to setpoints will have their own 10CFR50.59 review. The more limiting seized rotor data was used as input for the fuel pin integrity calculation. This analysis is addressed in this 10CFR50.59 review.

The applicability of the transient and accident analyses to the Cycle 18 core was determined by comparison of the Cycle 18 specific physics parameters to the safety analysis assumptions developed to support operation at a power of 3026 MWt. This comparison is summarized in the Physics Assessment Checklist (PAC) described in the Cycle 18 Reload Analysis Report. PAC parameters that failed to meet the acceptance criteria were evaluated with Cycle 18 specific analyses, incorporated into COLR limits, or will be incorporated in setpoint analysis.

The implementation of ZrB_2 fuel on the Non-LOCA safety analyses was evaluated. The impact of core peaking, burnup dependence of moderator temperature coefficient, decrease in fuel gas gap, gas release, and annular fuel pellets were reviewed. It was determined that current Non-LOCA methodology remains valid and would provide bounding results for the IFBA fuel with ZrB_2 design. The CEA Ejection event was identified as a Non-LOCA event that could be impacted by this fuel design change.

The impact of the implementation of ZIRLO cladding on the Non-LOCA safety analysis was evaluated. Of the different Non-LOCA safety analysis codes, it was concluded that those events analyzed with STRIKIN-II code requires re-analysis. The CEA Ejection analysis is the only Non-LOCA analysis that uses the STRIKIN-II code.

Based on the above, only the CEA Ejection event needs to be re-analyzed due to the fuel and cladding changes. In addition to the changes described above, the LOCA limit is changed from 13.7 to 14.4 kW/ft. This change in the limit impacts the limits described in the COLR. The events that are impacted by this change and the impact of this change will be discussed in the 10CFR50.59 review of the Cycle 18 COLR.

An ECCS Performance Analysis was performed for the implementation of ZrB_2 and ZIRLO during Cycle 18. This performance analysis included the Large and Small Break LOCA (LBLOCA and SBLOCA) and post-LOCA Long Term Cooling (LTC). The results of the analysis are presented in the table below.

Parameter	Results	Criterion
Peak Cladding Temperature, °F		
LBLOCA	2168	≤ 2200
SBLOCA	2137	
Maximum Cladding Oxidation, %		
LBLOCA	12.93	≤ 17
SBLOCA	12.4	
Core Wide Oxidation, %		
LBLOCA	0.655	≤ 1
SBLOCA	< 0.76	
Coolable Geometry	Yes	Yes
Long Term Cooling	Yes	Yes

RESPONSES TO QUESTIONS

1. Licensing Basis Documents

a. Operating License

The Cycle 18 reload analysis describes and addresses the design, accident analyses and performance of the ANO-2 Cycle 18 core. The results of the reload analyses presented in the subject report fall within the requirements for operating the Cycle 18 core as referenced or described in the ANO-2 Operating License. The Operating License does explicitly impose a limit on individual fuel rod burnup. The physics assessment performed as part of the reload efforts verified that this limit will not be exceeded.

The Cycle 18 core design and results fully comply with the criteria discussed in the ANO-2 Technical Specifications. All the input assumptions and methods are consistent with or conservative with respect to the ANO-2 Technical Specifications. All cycle-specific limits for operation of the Cycle 18 core are located in the Cycle 18 Core Operating Limits Report (COLR). The cycle specific COLR is a separate document from the reload analysis report. The remaining Technical Specification Safety Limits, Limiting

Safety Settings and Limiting Conditions of Operations governing the operation of the Cycle 17 core are bounding for the Cycle 18 core.

The results of the reload analysis are within the requirements for operating the ANO-2 Cycle 18 core as referenced or described in the ANO-2 Confirmatory Orders. The specific results of the analysis are beyond the scope of the orders.

Based upon the above discussion, no changes to the ANO-2 Operating License, Technical Specifications or NRC Orders are required to support the operation of the Cycle 18 core.

b. LBDs Controlled Under 50.59

The results of the reload analyses are within the requirements for operating the Cycle 18 core as referenced or described in the ANO-2 SAR except for Chapters 4, 6 and 15.

Chapter 4 of the SAR describes the fuel, reactor internals, reactivity control systems, the nuclear and thermal / hydraulic design and the testing and verification of the core. The analysis and results of the large break and small break LOCA is described in Chapter 6. Chapter 15 describes the various safety analyses. Information presented in the reload analysis report impacts the information presented in these chapters. Therefore, a 10CFR50.59 evaluation is required and is included as part of this review. An LDCR has been prepared for these changes.

The results of the reload analyses are within the requirements for operating the Cycle 18 core as referenced or described in the bases of the ANO-2 Technical Specifications, TRM and the NRC SERs associated with ANO-2. These results do not invalidate any information presented in these documents. Therefore, no changes are required to these documents for the operation of Cycle 18.

The Cycle 18 COLR provides the specific operational limits for the Cycle 18 core. Technical Specification 6.9.5 requires the COLR to be revised for each reload as a minimum. The COLR is a separate engineering document from the reload analysis report. The COLR is being prepared and a separate 10CFR50.59 review will be performed for it. Therefore the changes to the COLR are not addressed in this review. The OSRC concurrence with the 10CFR50.59 review of the COLR is contingent upon this 10CFR50.59 review.

c. LBDs Controlled Under Other Regulations

The Cycle 18 reload analyses results are beyond the scope of the QAPM, ANO E-Plan, Fire Protection Program and the ODCM. Based on this, no changes to these documents are required to support the operation of the Cycle 18 core.

2. Test or Experiment

The implementation of the Cycle 18 fuel assembly and core design changes do not constitute testing or experimentation. All characteristics of the Cycle 18 core are determined using NRC approved methods. Tests will be performed to verify design characteristics of the Cycle 18 core, but these tests are fully described in Section 4.5 of the ANO-2 SAR.

4. References

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.5.1[5](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
AUTONOMY – 50.59 – Unit 2	OPTIN: Zircaloy; "CEA ejection"; ZIRLO; erbia; IFBA; "zirconium diboride"; LOCA; "large break"; "small break"; "fuel performance"; "pin pressure"; reload*; batch*; cladding; burnup; "ROCS"; "DIT"

LBDs/Documents reviewed manually:

ANO-2 Operating License

ANO-2 Technical Specification 6.9.5

ANO-2 SAR Chapters 4, 6 and 15 (including the figures for these chapters)

5. Is the validity of this Review dependent on any other change? X Yes ☐ No

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

The following items need to be addressed prior to the initial criticality of the ANO-2 Cycle 18 core. These items are:

1. NRC approval of ANO-2 Technical Specification Change Request to use ZIRLO, ZrB_2, and change the COLR reference list.
2. ANO-2 Cycle 18 COLR
3. ANO-2 Cycle 18 COLSS and CPC constant changes
4. Contingencies listed in Tables 6-10 and 7-3 of the Cycle 18 reload report.

The Cycle 18 reload report and its associated 10CFR50.59 review is needed prior to the onload of the Cycle 18 core. The items listed above can be completed after the Cycle 18 core is loaded. The approval of the requested Technical Specification change is needed to utilize the new poison, cladding material and physics code. This 50.59 reviewed assumed these changes have been approved by the Staff. These are all utilized in the fresh assemblies for Cycle 18.

The Cycle 18 COLR does not impose any operating limits on the core until Mode 5 is reached. ANO-2 currently has a restraint on the transition into Mode 5 until the COLR for that cycle has been issued by Licensing to the NRC. Prior to the reactor trip breakers being closed, the COLSS and CPC constants need to be revised to incorporate the Cycle 18 setpoint analysis. This is due to the fact that the CPCs will provide reactor protection once the logarithmic power level – high bypass is removed. As noted in the reload report, the contingencies need to be verified prior to the Cycle 18 startup.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure ENS-EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	X	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	X	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	X	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	X	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	X	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	X	Discharge any chemicals new or different from that previously discharged?
7.	☐	X	Change the design or operation of the intake or discharge structures?
8.	☐	X	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	X	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	X	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	X	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	X	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	X	Involve the installation or modification of a stationary or mobile tank?
14.	☐	X	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	X	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure ENS-EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	X	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	X	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	X	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	X	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	X	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	X	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	X	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	X	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	X	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	X	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING
(NOTE: This section is not applicable to Waterford 3 and may be removed from 50.59 Reviews performed for Waterford 3 proposed activities.)

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure ENS-LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	X	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	X	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	X	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	X	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	X	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	X	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	X	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	X	Involve a change to the Fuel Building electrical power?
9.	☐	X	Involve a change to the Fuel Building ventilation?
10.	☐	X	Involve a change to the ISFSI security?
11.	☐	X	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	X	☐	Involve a change to spent fuel characteristics?
13.	☐	X	Redefine/change heavy load pathways?
14.	☐	X	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	X	Involve a change to the loading bay or supporting components?
16.	☐	X	New structures near the ISFSI?
17.	☐	X	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	X	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes X No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes X No

BASIS:

Core Neutronics and Fuel Management

The Cycle 18 fuel design changes have been explicitly incorporated in the neutronics models. The Cycle 18 Physics Assessment Checklist was evaluated based on the Cycle 18 specific core performance. Parameters that were not confirmed to be bounded by assumptions employed in the analysis of record (AOR) were evaluated with a Cycle 18 specific analysis or plant operation will be restricted to meet the parameters by incorporation into the COLR or setpoints.

The Cycle 18 core configuration does not require any changes to plant equipment or modes of operation. The initiators to accidents previously evaluated in the FSAR are not affected and the probability of an accident is not increased due to the Cycle 18 core.

Reload Assembly Design Changes

Evaluations of the impact of the design changes implemented for Batch X assemblies have shown that none of the fuel assembly mechanical structural design criteria for the normal operating and upset conditions, emergency conditions and faulted conditions are violated.

Westinghouse has successfully provided full batch application of the design features described previously to Westinghouse plants. There are no required changes in any vendor's quality control procedures, quality surveillance programs, or fabrication processes to ensure correct loading of fuel and burnable poison in assemblies and in the core. Therefore, the frequency of erroneous loading of fuel pellets or fuel pins of different enrichment in a fuel assembly or erroneous placement or orientation of fuel assemblies in the core due to these design change features is not increased.

The frequency of fuel failures due to mechanical or flow induced vibration and fretting with the spacer grids will not be increased. The Batch X fuel assembly has the same structural cage as the previous reload. The rods in the assembly have the same external dimensions, clad thickness and approximate mass as the Cycle 17 rods.

The frequency of a fuel handling accident will not be increased. The Cycle 18 assemblies have the same structural cage as that previously used at ANO-2 and will be capable of withstanding the expected handling loads. These assemblies will continue to be compatible with the fuel handling equipment. The manner of handling the new fuel assemblies will be unchanged. The envelope of the new fuel is no different than that of the past. The mass of these new assemblies remains relatively unchanged compared to the previous batch.

The frequency of CEA misoperation is not increased. The dimensions and positions of the CEA guide tube assemblies are unchanged compared to the assemblies used in the previous cycles. Also, any dimensional changes due to irradiation, such as assembly bow, will not be altered since no changes in the guide tube material have occurred.

Transient and Accident Analyses

One non-LOCA transient and both the LBLOCA and SBLOCA transients were evaluated as part of the assessment of the Cycle 18 reload core. The one non-LOCA transient is CEA Ejection. An ejected CEA is assumed to occur due to a complete circumferential break of either the control element drive mechanism (CEDM) housing or the CEDM nozzle on the reactor vessel. Loss of coolant accidents encompasses a range of possible reactor coolant system break sizes. The operating conditions for CEA ejection or LOCAs remain unchanged such that the accident initiators remain unaffected due to the Cycle 18 reload core. Therefore the frequency of occurrence of a transient is not increased due to this change.

No changes to plant equipment or operating procedures are required for Cycle 18. As discussed above there are no impacts to any of the accident initiators due to the fuel management, fuel assembly design changes or the transient analyses changes. Therefore the proposed changes will not result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes X No

BASIS:

Core Neutronics and Fuel Management

The Cycle 18 reload core has similar reactivity performance as previous cycles with the exception of the increase in reactivity during the first approximately 100 EFPD of the cycle. The critical boron levels, reactivity coefficients, and power distributions are consistent with cycle-to-cycle variations and the expected variation in reactivity behavior early in the cycle. The introduction of the Cycle 18 reload fuel will not require equipment important to safety to be operated in a different manner or with a higher duty. Therefore the probability of a malfunction of a structure, system or component important to safety is not increased due to the introduction of the Cycle 18 core.

Reload Assembly Design Changes

The minor changes in the grid cage assembly design are considered in the Cycle 18 reload analyses. The Batch X assemblies are materially, dimensionally and structurally the same as previous fuel designs. No changes in the assumptions concerning structure, systems or components availability or failure modes are made. Therefore the changes to the design of the reload assemblies do not increase the likelihood of occurrence of a malfunction of a structure, system or component previously in the FSAR.

Transient and Accident Analyses

The changes to the inputs for the analyses of the CEA ejection and LOCA events did not include any changes concerning the availability of any structure, system or component important to safety. No new failure modes were assumed in these analyses as well. Therefore the probability of a malfunction of a structure, system or component important to safety is not increased due to the introduction of the Cycle 18 transient analyses.

No changes in the assumptions concerning the structure, system or component important to safety availability or failure modes were made in the Cycle 18 reload core. The structures, systems or components will be maintained and operated within the design and licensing basis for ANO-2 and does not impact the function of the supporting equipment. Based on the above discussion, the Cycle 18 reload core will not result in more than a minimal increase in the likelihood of a structure, system or component important to safety malfunctioning.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes X No

BASIS:

Core Neutronics and Fuel Management

The Cycle 18 fuel design changes have been explicitly incorporated in the neutronics models. The Cycle 18 Physics Assessment Checklist was evaluated based on the Cycle 18 specific core performance. Parameters that were not confirmed to be bounded by assumptions employed in the AOR were evaluated with a Cycle 18 specific analysis, or plant operation will be restricted to meet the parameters by incorporation into the COLR or setpoints. The consequences of events evaluated on a cycle specific basis are addressed below. The consequences of events bounded by the AOR are not increased due to fuel design changes.

The current fuel storage criticality analysis has been confirmed to be applicable to the Batch X reload fuel. The current storage and handling criteria preclude criticality during normal and postulated events, so the consequences are not affected.

Reload Assembly Design Changes

The mechanical design of the Batch X reload fuel assemblies is virtually identical to the assemblies that have been utilized at ANO-2 previously. The mechanical design bases have not changed since the original fuel design.

Regulatory Guide 1.25, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors," specifies the assumptions to be used in evaluating the potential radiological consequences of a fuel handling accident. One of the assumptions listed is that a generic spent fuel pool (SFP) decontamination factor (DF) of 100 is valid for maximum fuel rod internal pressures up to 1200 psig. Fuel performance analyses for Cycle 18 determined that the internal rod pressures would exceed the 1200 psig assumption. Per the requirements of Regulatory Guide 1.25, the DF must then be calculated for the actual pressure using the assumptions "comparable" in conservatism to those previously assumed.

A review of the experimental data supports a much higher DF for pressures up to 1500 psig. In fact, Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," prescribes a DF of 200 with no explicitly stated pressure limit. Also, the NRC recently issued new guidance in its SER to WCAP 16072, "Implementation of Zirconium Diboride Burnable Absorber Coatings in CE Nuclear Power Fuel Assembly Designs," which allows use of a DF for fuel pressures up to 1500 psig even for those plants using Regulatory Guide 1.25. This new guidance is based on the recognition that the experimental data supports a much higher DF than the value specified in Regulatory Guide 1.25.

Therefore, the current SFP DF of 100 is applicable for internal SFP pressures up to 1500 psig for CE plants using WCAP 16072 as an applicable methodology. The Cycle 18 fuel performance analysis determined the internal pin pressure would be less than 1500 psig. It should be noted that this applies to all rods and not just the zirconium diboride rods.

The Batch X fuel assemblies have the same envelope, dimensions, structural cage and virtually the same mass as that previously used at ANO-2. Therefore, the number of fuel pins that will fail during a fuel handling accident will not be more than the current analyzed pin failures.

Based on the DF remaining the same as does the number of failed pins during a fuel handling accident, the consequences of this event is not increased due to these changes.

Adequate shoulder gap is predicted for all of the fuel present in the Cycle 18 reload core. The chemical and metallurgical performance of the Batch X fuel will be similar to the other fuel in the core. As such, no

change will occur in the radiological release rate / duration, no new release mechanisms can be postulated, and no impact will occur to any radiation release barriers.

Transient and Accident Analyses

The analysis input and assumptions used in the calculation of the radiological dose releases for the CEA ejection event are the same as the current AOR. No radiological dose calculations were performed for the Cycle 18 CEA ejection event since the results of this analysis for this event demonstrated that there are no fuel failures for the HFP and HZP conditions. The radiological dose results for the 2-hour Exclusion Area Boundary and the 8-hour Low Population Zone are unchanged from the analysis of record.

The ECCS Performance Analyses concluded that the ANO-2 Cycle 18 operation conforms to the acceptance criteria given in 10CFR50.46. The calculation of the post-LOCA dose consequences is based on a set of maximum hypothetical core damage assumptions that far exceed the worst case damage estimates of the ECCS analyses. The assumptions used in the post-LOCA dose consequences were not changed due to the Cycle 18 reload core.

No new release mechanism or radiological release rate / duration were introduced based on the transient analyses described above.

No changes in the radiological release rate / duration, no new release mechanism was postulated and no impact to any of the radiation release barriers occurred due to the Cycle 18 reload core. Based on the above, the Cycle 18 core and its operation will not result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes X No

BASIS:

Core Neutronics and Fuel Management

The Cycle 18 fuel design changes have been explicitly incorporated in the neutronics models. The Cycle 18 Physics Assessment Checklist was evaluated based on the Cycle 18 specific core performance. Parameters that were not confirmed to be bounded by assumptions employed in the analysis of record were evaluated with a Cycle 18 specific analysis or plant operation will be restricted to meet the parameters by incorporation into the COLR or setpoints. The consequences of events evaluated on a cycle specific basis are addressed below. The consequences of events bounded by the analysis of record are not increased due to fuel design changes.

The current fuel storage criticality analysis has been confirmed to be applicable to the Batch X reload fuel. The current storage and handling criteria preclude criticality during normal and postulated events, so the consequences are not affected.

Reload Assembly Design Changes

The changes in the design of the reload fuel assemblies are considered in the Cycle 18 reload analyses. The Batch X assemblies are dimensionally and structurally the same as previous reload batches. The use of zirconium diboride and ZIRLO does not negatively change the characteristics of the fuel rod; the dimensions / strength are unaffected. As such, no change will occur in the radiological release rate / duration, no new release mechanisms can be postulated and no impact will occur to any radiation release barriers.

The fuel performance analysis of the Cycle 18 core has been evaluated using NRC approved codes and all design criteria were confirmed to be met. The maximum rod burnup is less than the limit presented in the ANO-2 license. The clad's corrosion performance for Batch X will be better than the performance of the other batches in the Cycle 18 core. These were shown to satisfy all criteria.

No changes in the assumptions concerning equipment availability or failure modes were made. Therefore, the changes to the assemblies do not increase the consequences of a malfunction of a structure, system or component important to safety previously evaluated in the FSAR.

Transient and Accident Analyses

The changes to the inputs for the analyses of the CEA ejection and LOCA events did not include any changes concerning the availability of any structure, system or component important to safety. No new failure modes were assumed in these analyses as well. Therefore the transient analyses for the Cycle 18 reload core will not result in more than a minimal increase in the consequences of a malfunction of a structure, system or component important to safety previously evaluated in the FSAR.

The changes introduced as part of the Cycle 18 reload core do not place any greater reliance on a specific structure, system or component to perform a safety function than what has been previously evaluated. The specific changes associated with the reload core design, evaluation or operation do not change the manner in which plant systems are operated, equipment availability or equipment failure modes. Therefore, the Cycle 18 reload core will not result in more than a minimal increase in the consequences of a malfunction of a structure, system or component important to safety previously evaluated in the FSAR.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes X No

BASIS:

Core Neutronics and Fuel Management

The Cycle 18 reload core has similar reactivity performance as previous cycles with the exception of the increase in reactivity during the first approximately 100 EFPD of the cycle. The critical boron levels, reactivity coefficients, and power distributions are consistent with cycle-to-cycle variations and the expected variation in reactivity behavior early in the cycle. The introduction of the Cycle 18 reload fuel will not require equipment important to safety to be operated in a different manner or with a higher duty. Therefore the introduction of the Cycle 18 core does not create the possibility of an accident of a different type.

Reload Assembly Design Changes

The fuel performance of the fuel designs present in the Cycle 18 reload core were evaluated using NRC approved codes. All design criteria were confirmed to be met. The maximum rod burnup projected for Cycle 18 is less than the limit listed in the ANO-2 license.

The fuel performance analysis demonstrated that no change will occur in the radiological release rate / duration, no new release mechanisms can be postulated, and no impact will occur to any of the radiation release barriers.

No new equipment associated with the use of Batch X fuel is postulated. The change in poison and cladding will not alter the way the unit is operated. No changes in the failure modes of the equipment important to safety were assumed in the Cycle 18 analyses. No initiator to any of the accidents was impacted. Therefore the changes to the assemblies will not result in an accident of a different type than previously evaluated.

Transient and Accident Analyses

The analyses of the CEA ejection and the LOCA events for Cycle 18 did not introduce any new operating conditions, plant configurations or failure modes that could lead to an accident of a different type than any previously evaluated in the FSAR. These analyses do not require the use of new equipment or be operated in a different manner. No initiators were impacted due to these analyses.

The Cycle 18 reload core design did not introduce any new structure, system or component that would introduce a new accident initiator or failure mechanism that has not already been considered in the FSAR. There are no new system interactions or relationships that are created by the Core 18 core design. The possibility for an accident of a different type than any previously evaluated in the FSAR will not be created by the introduction of the changes associated with the Cycle 18 reload core.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes X No

BASIS:

Core Neutronics and Fuel Management

The Cycle 18 reload core has similar reactivity performance as previous cycles with the exception of the increase in reactivity during the first approximately 100 EFPD of the cycle. The critical boron levels, reactivity coefficients, and power distributions are consistent with cycle-to-cycle variations and the expected variation in reactivity behavior early in the cycle. The introduction of the Cycle 18 reload fuel will not require equipment important to safety to be operated in a different manner or with a higher duty. Therefore the introduction of the Cycle 18 core does not create the possibility of an accident of a different type.

Reload Assembly Design Changes

The Cycle 18 core design does not modify the design or operation of structures, systems, or components important to safety beyond the fuel itself. SSCs important to safety will function in the same manner with the reload core as with the Cycle 17 reload core. The changes in core characteristics do not change any parameter that would affect the function of SSCs important to safety. There are no new methods of failure associated with any of the changes associated with the Cycle 18 core.

The FSAR considers the RCS activity that would result from a limited number of fuel failures existing at all times. Regardless of the fuel failure mechanisms, which are not explicitly addressed in the FSAR, the changes introduced by the Cycle 18 core can not lead to a malfunction that is not bounded by the existing assumption on coolant activity. Fuel performance analyses have indicated that the fuel rod performance is bounded by the results of the current analyses of record. Therefore the introduction of the Batch X fuel assemblies does not create the possibility of an accident of a different type.

Transient and Accident Analyses

The analyses for the CEA ejection and LOCA events will not require equipment to be operated in a different manner than what they current operate. No changes to the failure modes of the structures, systems, or components were made for these events. New accident initiators are not assumed and no new equipment is required to mitigate these events is required. The transient analyses for the Cycle 18 reload core will not create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR.

The Cycle 18 reload core design, analysis or operations do not modify the design or operation of any structure, system or component important to safety beyond the fuel itself. The structures, systems, and components important to safety will function the same as Cycle 17 reload core. The changes in core characteristics do not change any parameter that would affect the function of structures, systems or components important to safety. There are no new methods of failure associated with any of the changes associated with the Cycle 18 reload core. Therefore, the Cycle 18 core will not create the possibility for a malfunction of a structure, system or component important to safety that has a different result than those already evaluated in the FSAR.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes X No

BASIS:

Core Neutronics and Fuel Management

The Cycle 18 fuel design changes have been explicitly incorporated in the neutronics models. The Cycle 18 Physics Assessment Checklist was evaluated based on the Cycle 18 specific core performance. Parameters that were not confirmed to be bounded by assumptions employed in the AOR were evaluated with a Cycle 18 specific analysis, or plant operation will be restricted to meet the parameters by incorporation into the COLR or setpoints. The margin of safety for events bounded by the AOR is not increased due to fuel design changes.

The current fuel storage criticality analysis has been confirmed to be applicable to the Batch X reload fuel. The criticality analysis demonstrated that fuel stored consistent with the Technical Specification limits will maintain a k-effective of 0.95 in the spent fuel racks, containment temporary storage racks and fuel carrier under all necessary conditions. The analysis of the new fuel vault demonstrates that fuel will maintain a k-effective below 0.95 during normal conditions and below 0.98 under optimum moderation conditions.

Reload Assembly Design Changes

OPTIN, the Zircaloy-4 fuel cladding material that is currently in use at ANO-2 is nearing its performance limits in high-duty applications. These applications include greater plant operating efficiencies, higher power ratings and extended burnups. These applications result in harsher core environments that have placed greater demands on the fuel. With more demanding fuel duties has come evaluation of the corrosion resistance of the fuel cladding. OPTIN is nearing its limits in terms of corrosion. High corrosion levels and some small areas of spallation have been observed on OPTIN fuel rods that are subjected to these demanding conditions. ZIRLO-clad fuel has operated in higher duty and more demanding conditions without excessive corrosion and no oxide spallation observed.

Only the OPTIN cladding will be replaced with ZIRLO cladding in the Cycle 18 reload batch. The structural material including the grids will continue to be Zircaloy-4. Based on assessments performed by Westinghouse, the implementation of ZIRLO cladding is expected to cause little if any change in the fretting wear.

The change in the cladding material from OPTIN to ZIRLO will have a negligible effect on the nuclear performance since the primary change in physics properties is a small increase in neutron absorption attributable to the addition of niobium. An increase in neutron absorption of this magnitude has no effect on nuclear performance.

The fuel performance of the fuel designs has been evaluated using NRC approved codes and all design criteria were confirmed to be met.

Transient and Accident Analyses

The analyses of the CEA ejection and the LOCA events assume a breach in one of the fission product barriers (e.g., the RCS pressure boundary). This is part of the licensing basis for ANO-2.

The CEA ejection analysis demonstrated no fuel was calculated to have failed due to this event for Cycle 18.

The Cycle 18 ECCS Performance Analysis demonstrated that the results of the LBLOCA, SBLOCA and long term cooling apply to Cycle 18. Coolable geometry and long term cooling were both maintained.

The Containment AOR remains unaffected by the Cycle 18 reload. No changes were made to the core design or operations that would affect the RCS mass and energy that would be released during the Design Basis LOCA. Therefore, there is no impact to the containment analysis.

Analyses have been performed to demonstrate compliance with the design basis limits for the three fission product barriers. The Cycle 18 reload core design and operation is predicted to operate conservatively with respect to the design basis limits. The Cycle 18 reload core changes do not result in a FSAR described design basis limit for a fission product barrier being exceeded or altered.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes X No

BASIS:

Core Neutronics and Fuel Management

The Cycle 18 core neutronics analysis was performed using the Westinghouse analysis methods. The applicability of these methods for erbia poisoned fuel has been evaluated and approved by the NRC. The NRC's review concluded that the methods are applicable to ZrB_2 fuel. Therefore, the proposed change does not result in a departure from a method that will be described in the FSAR.

Reload Assembly Design Changes

In approving the use of ZIRLO as a cladding material, the NRC required Westinghouse to either modify some of the methodologies that were being used to include the material properties of ZIRLO or in the case of the ECCS evaluations, certain revisions of previously approved methodologies. All of the NRC required codes and methodologies were utilized in the evaluation of the Cycle 18 core. The NRC has approved all of the required changes. The proposed changes to the reload assemblies do not result in a departure from a method that is described in the FSAR.

Transient and Accident Analyses

The Cycle 18 CEA ejection analysis is performed using the STRIKIN-II and FATES codes. These are the same codes that are described in the FSAR for this event. The methodology used in this analysis is consistent with the ones used in the AOR.

The ECCS Performance Analysis was performed with the 1999 EM for LBLOCA, S2M for SBLOCA and the post-LOCA long term cooling methodologies. These are the same methodologies that are utilized in the current AOR for these events.

All of the transient analyses for the Cycle 18 reload core were performed with the same method of evaluation as described in the FSAR for these events.

No new methodology was introduced during the evaluation and assessments of the Cycle 18 reload core. All evaluations and assessments continued to use existing FSAR described methodologies for neutronics, fuel performance, transient and accident analyses.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ANO 50.59 Evaluation Number

2005-007

I. OVERVIEW / SIGNATURES

Facility: ANO-2

Document Reviewed: A2-NE-2004-001, "ANO-2 Cycle 18 Core Operating Limits Report (COLR) "

Change/Rev.: 0

System Designator(s)/Description: REAN

Description of Proposed Change:

The following changes were made in the Cycle 18 COLR as compared to the Cycle 17 COLR:

1. Methodology References: This section was added to the COLR due to a commitment to the NRC as described in the safety evaluation provided by the NRC for Amendment 257 to the ANO-2 Technical Specifications.
2. Moderator Temperature Coefficient (MTC): Modified the breakpoints that specify the times in cycle at which a less positive (burnup dependent) MTC was credited in the safety analyses. Changed the first breakpoint from 124.9 EFPD to 125.0 EFPD. The second breakpoint was changed from 394.7 EFPD to 395.8 EFPD.
3. Power Dependent Insertion Limits (PDIL): Modified Figure 3 by rotating the axis of the graph and splitting the graph into two (2) group specific graphs. Also included shading to specific areas to illustrate when Long term Steady State Actions apply and when Short Term Steady State Actions apply and when shutdown margin was not satisfied. There are no limit changes, just editorial.
4. Linear Heat Rate (LHR): Modified the limit of ≤ 13.5 kW / ft for cycle burnup up to and including 200 EFPD and ≤ 12.7 kW / ft for burnup exceeding 200 EFPD to ≤ 13.7 kW / ft.

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

X	**EDITORIAL CHANGE of a Licensing Basis Document (For change #3 listed above)**	**Section I**
☐	**SCREENING**	**Sections I and II required**
X	**50.59 EVALUATION EXEMPTION (For change #1 listed above)**	**Sections I, II, and III required**
X	**50.59 EVALUATION (#:) FFN-05-007 (For changes #2 and 4 listed above)**	**Sections I, II, and IV required**

Preparer: Robert W. Clark / [signature] / ENS / Safety Analysis / 03/24/05
Name (print) / Signature / Company / Department / Date

Reviewer: TODD A. ERSKINE / Todd Erskine / ENS / SYE / 3-24-05
Name (print) / Signature / Company / Department / Date

OSRC: J.R Eichenberger / [signature] / 3-25-05
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	X	
TS	☐	X	
NRC Orders	☐	X	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM ENS-LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	☐	X	
TS Bases	☐	X	
Technical Requirements Manual	☐	X	
Core Operating Limits Report	X	☐	Entire document
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	X	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	X	
If "YES", perform an Exemption Review per Section III OR perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. AND initiate an LBD change in accordance with NMM ENS-LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	X	
Emergency Plan[2, 3]	☐	X	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	X	
Offsite Dose Calculations Manual[3, 4]	☐	X	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM ENS-LI-113. No further 50.59 review is required.			

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

2. **Does the proposed activity involve a test or experiment not described in the FSAR?** ☐ Yes X No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. Basis

Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Discuss other LBDs if impacted. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis.

BACKGROUND

The addition of the references to the methodologies used to develop the COLR is required per the SER for Amendment 257 to the ANO-2 Technical Specification. This change will not be discussed further in this review since it has been reviewed and approved by the NRC.

There are no changes in the actual PDIL limits in Figure 3. The intent of this change is editorial in nature. The changes will split the current graph into two graphs. One for Group "P" CEAs and one for Group 6 CEAs. Since the operators think about CEA position as a vertical position in the core, the axes of Figure 3 have been swapped to where CEA position is in the vertical axis and reactor power is on the horizontal axis. Areas on the graph where Long Term or Short Term Steady State Actions apply or where shutdown margin is not satisfied are more clearly delineated than on the Figure 3 used in Cycle 17. This change will not be discussed further in this review.

There are no changes in the actual MTC limits in Figure 1 of the COLR. The COLR also documents the EFPD break points at which credit is taken for less positive MTCs than the COLR limit in the Single CEA Withdrawal analyses. These analyses apply the most positive COLR limit from beginning of cycle to a mid-point in the life of the core. Less positive MTCs are used from this midpoint to the end of the cycle. For Cycle 18 the midpoints changed.

The LHR rate when COLSS is out of service was changed to remove the step change at a specific burnup and make the limit applicable for the entire cycle. In addition the LHR limit was raised to 13.7 kW/ft. This change was made in part of the loss of COLSS event at ANO-2 in a previous cycle.

RESPONSES TO QUESTIONS

1. Licensing Basis Documents

a. Operating License

ANO-2 Technical Specification 6.6.5 requires "the core operating limits be established and documented in the Core Operating Limits Report [COLR] prior to each reload cycle". Technical Specification 6.6.5.b lists the analytical methods used to develop the operating limits. The subject document meets the requirements of these two specifications.

The actual cycle-specific limits that are listed in the COLR are not addressed in the ANO-2 Technical Specifications. The Technical Specification Safety Limits, Limiting Safety Settings and Limiting Condition of Operations governing the operation of the Cycle 18 core remain bounding.

The actual cycle-specific limits are beyond the scope of the ANO-2 Operating License, Technical Specifications and the NRC Confirmatory Orders associated with ANO-2.

Based upon the above discussion, no changes to the ANO-2 Operating License, Technical Specifications or NRC Orders are required to support the operation of the Cycle 18 core.

b. LBDs Controlled Under 50.59

The subject document is Revision 0 of the ANO-2 Cycle 18 COLR. Therefore, an evaluation is required for a portion of the proposed changes. The scope of the evaluation is limited to the change in the MTC burnup limits and the LHR limit change. An LDCR has been prepared.

The ANO-2 SAR does discuss some of the values listed in the text of the COLR, particularly in Chapters 4, 6, and 15. The limits listed in the COLR ensure that the limits (e.g., fuel thermal-mechanical limits, core thermal-hydraulic limits, ECCS limits, nuclear limits like shutdown margin (SDM), and transient and accident analysis limits) of the safety analysis are met. With respect to the MTC breakpoints, these are only credited in the single CEA Withdrawal analysis, which is beyond SAR discussion's level of detail.

The bases of the ANO-2 Technical Specifications and the NRC's SERs associated with ANO-2 discuss in general the parameters and the limits listed in the COLR. The values for the cycle-specific limits are beyond the scope of the bases of the ANO-2 Technical Specifications and SERs.

The cycle-specific operating limits listed in the COLR are beyond the scope of the ANO-2 Technical Requirements Manual (TRM).

No changes are required to the ANO-2 SAR, Technical Specification bases, NRC SERs, or the TRM. The COLR is being revised for Cycle 18 operation.

c. LBDs Controlled Under Other Regulations

The cycle-specific operating limits listed in the COLR are beyond the scope of the QAPM, ANO E-Plan, Fire Protection Program and the ODCM. Based on this, no changes to these documents are required to support the operation of the Cycle 18 core.

2. Test or Experiment

The implementation of the Cycle 18 specific operating limits does not constitute testing or experimentation. All characteristics of the Cycle 18 core are determined using NRC approved methods. Any test that must be performed to verify the operation of the Cycle 18 core within the limits listed in the COLR (e.g., MTC) are described in Section 4.5 of the ANO-2 SAR.

4. References

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.5.1[5](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
AUTONOMY – 50.59 – Unit 2	"moderator temperature coefficient"; MTC; "linear heat rate"; LHR; "peak linear heat"; PLHGR

LBDs/Documents reviewed manually:

ANO-2 Operating License

ANO-2 Technical Specifications 3.1.1.4 and 6.6.5

ANO-2 SAR Chapters 4 and 15

ANO-2 Cycle 17 COLR

5. **Is the validity of this Review dependent on any other change?** ☐ **Yes** X **No**

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure ENS-EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	X	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	X	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	X	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	X	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	X	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	X	Discharge any chemicals new or different from that previously discharged?
7.	☐	X	Change the design or operation of the intake or discharge structures?
8.	☐	X	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	X	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	X	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	X	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	X	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	X	Involve the installation or modification of a stationary or mobile tank?
14.	☐	X	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	X	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure ENS-EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	X	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	X	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	X	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	X	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	X	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	X	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	X	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	X	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	X	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	X	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

(NOTE: This section is not applicable to Waterford 3 and may be removed from 50.59 Reviews performed for Waterford 3 proposed activities.)

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure ENS-LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	X	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	X	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	X	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	X	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	X	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	X	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	X	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	X	Involve a change to the Fuel Building electrical power?
9.	☐	X	Involve a change to the Fuel Building ventilation?
10.	☐	X	Involve a change to the ISFSI security?
11.	☐	X	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	X	Involve a change to spent fuel characteristics?
13.	☐	X	Redefine/change heavy load pathways?
14.	☐	X	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	X	Involve a change to the loading bay or supporting components?
16.	☐	X	New structures near the ISFSI?
17.	☐	X	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	X	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

III. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A.1.

A. Check the applicable boxes below. If any of the boxes are checked, clearly document the basis in Section III.B, below. If none of the boxes are appropriate, perform a 50.59 Evaluation in accordance with Section IV. Provide supporting documentation or references as appropriate.

☐ The proposed activity meets all of the following criteria regarding design function per Section 5.5[1](a):

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; AND

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; AND

The proposed activity does not adversely affect a method of evaluation that demonstrates intended design function(s) of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed activity already exists per Section 5.5[1](b). Reference 50.59 Evaluation # _____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

X The NRC has approved the proposed activity or portions thereof per Section 5.5[1](c). Reference: SER for Amendment 257

B. Basis

Provide a clear, concise basis for determining the proposed activity may be exempted such that a third-party reviewer can reach the same conclusions.

In the SER for Amendment 257, the NRC approved the use of several Westinghouse computer codes and topicals at ANO-2. Also included in their approval was the change of moving the details of the topicals listed in the ANO-2 Technical Specifications to the COLR.

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes X No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes X No

   BASIS:

   The cycle-specific limits presented in the 18 COLR will ensure that ANO-2 is operated during Cycle 18 in a manner that is consistent with the assumptions used in the safety analysis for this cycle. The appropriate actions required if these limits are violated are in the ANO-2 Technical Specifications and are not being changed. The COLR affects only the operational limits and has no impact on the initiating event of any accident previously evaluated in the FSAR.

   No changes to plant equipment or operating procedures are required for Cycle 18. As discussed above there are no impacts to any of the accident initiators due to the changes in the operating limits. Therefore the proposed changes will not result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes X No

   BASIS:

   The Cycle 18 COLR only affects the operational limits and ensures that the Cycle 18 core is operated in a manner that is consistent with the assumptions used in the analyses for this core design. No changes in the assumptions concerning the structure, system or component important to safety availability or failure modes were made in the Cycle 18 reload core design. The structures, systems or components will be maintained and operated within the design and licensing basis for ANO-2 and does not impact the function or duty of the supporting equipment. Based on the above discussion, the Cycle 18 operational limits presented in the cycle-specific COLR will not result in more than a minimal increase in the likelihood of a structure, system or component important to safety malfunctioning.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes X No

   BASIS:

   The operational limits in the COLR ensure that the unit is operated in Cycle 18 in a manner that is consistent with the assumptions used in the safety analyses for Cycle 18. The required actions, if these limits are violated, are in the ANO-2 Technical Specifications and are not being changed. Changing the breakpoints for the MTC and the limits for LHR does not result in a change in the evaluated consequences of accidents. The analyses for the reload have been performed with NRC approved methodologies to ensure the Specified Acceptable Fuel Design Limits (SAFDLs) will not be violated and the dose consequences are bounded by the results in the licensing basis analyses. Therefore, the consequences of an accident previously evaluated in the FSAR will not be increased.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes X No

BASIS:

The Cycle 18 specific COLR did not require any changes to the assumptions concerning structure, system or component availability or failure modes. This document does not involve any changes in the structures, systems or components. In addition, the COLR does not impact the overall function or duty of the structures, systems or components important to safety. These operational limits will not result in a change to the evaluated consequences of the accidents, which also include consideration of all relevant structure, system and component malfunctions. Therefore, the consequences of a malfunction of a structure, system or component important to safety will not be increased.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes X No

BASIS:

The operational limits provided in the COLR will ensure that ANO-2 is operated during Cycle 18 in a manner that is consistent with the assumptions used in the Cycle 18 safety analyses. The COLR does not create an additional failure mode than what has already been analyzed. No initiators to any of the accidents are impacted by this document. No new operating conditions or plant configurations are created that could lead to an accident of a different type than any previously evaluated in the FSAR. Based on the above, the possibility of an accident of a different type than any previously evaluated in the FSAR will not be created.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes X No

BASIS:

No changes in the failure modes of the structures, systems or components important to safety are assumed in the Cycle 18 COLR. No new operating conditions or plant configurations are created that could lead to a malfunction of structures, systems or components of a different type than any previously evaluated in the FSAR. Therefore, the possibility of a malfunction of a structure, system or component important to safety with a different result than previously evaluated in the FSAR will not be created by this document.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes X No

BASIS:

The Cycle 18 reload safety analyses were performed to demonstrate compliance with the design basis limits for the three fission product barriers. In some cases, the analyses demonstrated that a higher operating limit could be utilized. The operating limits presented in the Cycle 18 COLR will ensure that the core is operated in Cycle 18 in a manner that is consistent with the Cycle 18 safety analysis assumptions. Based on the above, the COLR for Cycle 18 does not result in a FSAR described design basis limit for a fission product barrier being altered or exceeded.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes X No

BASIS:

ANO-2 Technical Specification 6.6.5 lists the NRC approved methodologies that are to be used to determine the core operating limits that are presented in the COLR. Section III of the COLR provides the details of which revisions and supplements to the methodologies listed in the Technical Specifications. The Cycle 18 limits were developed using these methodologies.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ANO 50.59 Evaluation Number

2005-008

I. OVERVIEW / SIGNATURES

Facility: *ANO-2*

Document Reviewed: ***ER-ANO-2003-0245-017 ERCN 07 - U2 Shroud Upgrade Project***
Change/Rev.: ***0***

System Designator(s)/Description: ***RCS/Reactor Coolant System &***
RBHV/Reactor Building Heating & Ventilation

Description of Proposed Change:

The U2 Shroud Upgrade project has been deferred from 2R17. ERCN 07 will document the final as-built, as left design configuration changes made during 2R17. They include:

1. **Changes to the 2R-1 Closure Head & Shroud**
   - 1.1. Field Fabrication of the 2CCA-17-H1 and 2CCA-17-H26 pipe support hangers to support the repairs to the high point vent line per ERCN 06.
   - 1.2. Installation of a bolted plate on the shroud base ring to provide structural support and a ventilation boundary below the high point vent flange held by pipe support 2CCA-17-H26.
   - 1.3. Substitution of bolting materials for shroud trunnion.
2. **Changes to the Maintenance Structure**
   - 2.1. Installation of the alignment pins and removal of the 8 maintenance structure hold down bolts.
   - 2.2. Installation of the sway strut support beams (sway struts not installed) and the 2L-67/2L-68 hoist support beam.
   - 2.3. Removal of the folding bridges and installation of hand rails.
   - 2.4. Installation of the new duct supports on the east and west side of the Maintenance Structure.
3. **Changes to the 2M-78 Missile Shield**
   - 3.1. Installation of a new duct flange and duct spool piece where new damper 2HCD-8250 would have been installed.
4. **Other Changes**
   - 4.1. Removal of the half collar for the 2L-45 crane above the 2P-32B Reactor Coolant pump.
   - 4.2. Removal of the movable incore system components.
   - 4.3. Double fusing in cabinet 2C22 in necessary circuits per ERCN 08.

Changes to the U2 SAR include removal of reference to pre-filters associated with the 2VSF-35 CEDM cooling units, clarification of the position of the closure studs on the 2R-1 closure head during refueling activities, the fact that the Maintenance Structure is no longer bolted down, a typo correction to SAR Figure 5.1.-3, and a change to SAR Figure 8.3-73 for a conduit run change on the missile shield.

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	EDITORIAL CHANGE of a Licensing Basis Document	Section I
☐	SCREENING	Sections I and II required
☐	50.59 EVALUATION EXEMPTION	Sections I, II, and III required
☒	50.59 EVALUATION (#: FFN-05-008)	Sections I, II, and IV required

Preparer: Tim Woodson/ Tim R. Woodson /EOI/DE/ 3-31-05
Name (print) / Signature / Company / Department / Date

Reviewer: David Yates/ David Yates /EOI/DE/ 3-31-05
Name (print) / Signature / Company / Department / Date

OSRC: J.R. Eichenberger J R Eichenberger 4-4-05
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings and 50.59 Evaluations.]

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM ENS-LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	☒	☐	SAR Figure 5.1-3 (P&ID M-2230 Sht 2), SAR Figure 8.3-73 (E-2878), SAR Sections 5.4.1, 9.1.4.3.2, and 9.4.5.2
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	☒	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	☒	
If "YES", perform an Exemption Review per Section III OR perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. AND initiate an LBD change in accordance with NMM ENS-LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2, 3]	☐	☒	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculations Manual[3, 4]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM ENS-LI-113. No further 50.59 review is required.			

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

2. **Does the proposed activity involve a test or experiment not described in the FSAR?** ☐ Yes ☒ No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. Basis

Changes to the U2 SAR include removal of reference to pre-filters associated with the 2VSF-35 CEDM cooling units, clarification of the position of the closure studs on the 2R-1 closure head during refueling activities, the fact that the Maintenance Structure is no longer bolted down, installation of double fusing per ERCN 08, a typo correction to SAR Figure 5.1.-3, and a change to SAR Figure 8.3-73 for a conduit run change on the missile shield.

Operating License/Technical Specifications

The changes being made by ERCN 07 to ER-ANO-2003-0245-017 are below the level of detail described in the U2 Technical Specifications. The changes listed above have no adverse affect on information in the OL/TS contents and make no functional changes to any SSCs.

U2 SAR

Information in the U2 SAR is being changed to accommodate changes made by the U2 Shroud Upgrade Project or correct inaccurate statements found in the U2 SAR during development of the ER.

SAR Figure 5.1-3 of the U2 RCS System is being corrected to show the correct isometric reference. The figure currently calls isometric 2CCA-12-3/4" when it should correctly show 2CCA-17-3/4".

SAR Section 5.4.1 is being corrected to state that the 2R-1 closure studs remain on the head during movement of the closure head to and from the reactor vessel. CALC-91-D-6026-01 had always accounted for the studs being part of the polar crane load analysis. Historical L-2 load cell data also indicates that the head lift actual weight is approximately 270 kips, well below the 300 kip limit of the 2L-2 polar crane.

SAR Figure 8.3-73 is being revised to change details of conduit runs on the 426 elevation inside containment. No electrical functions are being altered. This is for E-2878.

SAR Section 9.1.4.3.2 for U2 Refueling. Some minor rewording for clarification. The change is that the Maintenance Structure is no longer being bolted down in its operating position. Shear style alignment pins have been installed that keep the Maintenance Structure installed during an OBE and DBE seismic event. A DRN against Maintenance Structure CALC-1.3.4.23 has documented this change and basis information.

SAR Section 9.4.5.2 for the RBHV system describes the 2VSF-35 units as containing a "low efficiency filter". This filter has not been installed in many years if at all since start up. Based on discussions with System Engineering, there is no desire to install filters due to the risk of degrading air flow to the CEDMs. Empirical evidence indicates that not having the low efficiency filter has not caused any degradation to the CEDM cooling system or CEDMs. As such, the SAR text will be modified to strike the low efficiency filter reference.

There are no other changes to any LBDs caused by ERCN 07 to ER-ANO-2003-0245-017

Tests or Experiments Considerations

ERCN 07 is performing normal post maintenance testing. Implementation of ERCN 07 does not require testing beyond that expected by the U2 SAR or cause the plant to be operated in a manner not described by the U2 SAR.

4. References

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.5.1[5](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
50.59 – Unit 2.	CEDM, CEDM shroud, cooling shroud, Maintenance Structure, Service Structure, HLR, Head Lift Rig, reactor head, containment, containment HVAC, refueling procedures, polar crane, movable incore, high point vent..

LBDs/Documents reviewed manually:

2SAR Figure 5.1-3, 2SAR Section 5.3.1.3, 2SAR Section 5.5.3., 2SAR Section 3.7.3.4.2.2.6.4, and 2SAR Section 3.9.3.1.3.2

5. **Is the validity of this Review dependent on any other change?**

☐ **Yes**
☒ **No**

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

(List the required changes / submittals.)

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure ENS-EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure ENS-EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

N/A

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

(NOTE: This section is not applicable to Waterford 3 and may be removed from 50.59 Reviews performed for Waterford 3 proposed activities.)

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure ENS-LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	☒	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	☒	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	☒	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	☒	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	☒	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	☒	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	☒	Involve a change to the Fuel Building electrical power?
9.	☐	☒	Involve a change to the Fuel Building ventilation?
10.	☐	☒	Involve a change to the ISFSI security?
11.	☐	☒	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	☒	Involve a change to spent fuel characteristics?
13.	☐	☒	Redefine/change heavy load pathways?
14.	☐	☒	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	☒	Involve a change to the loading bay or supporting components?
16.	☐	☒	New structures near the ISFSI?
17.	☐	☒	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	☒	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

III. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A.1.

A. Check the applicable boxes below. If any of the boxes are checked, clearly document the basis in Section III.B, below. If none of the boxes are appropriate, perform a 50.59 Evaluation in accordance with Section IV. Provide supporting documentation or references as appropriate.

☐ The proposed activity meets all of the following criteria regarding design function per Section 5.5[1](a):

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of evaluation that demonstrates intended design function(s) of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed activity already exists per Section 5.5[1](b). Reference 50.59 Evaluation # _____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

☐ The NRC has approved the proposed activity or portions thereof per Section 5.5[1](c). Reference: _____

B. Basis

Provide a clear, concise basis for determining the proposed activity may be exempted such that a third-party reviewer can reach the same conclusions.

An evaluation is attached.

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes ☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   The affected systems are the RCS system and the non-safety related portion of the RBHV sub-system that provides cooling to the CEDMs. The affected safety related functions are the RCS pressure boundary and the Seismic Class I capabilities of the RCS and supporting structures. Accident initiators of interest include those accidents that result in seismic events and LOCAs. The Maintenance Structure and affected components on the Missile Shield have been analyzed to meet seismic category I requirements, the failure during as OBE, or DBE has been analyzed to meet the requirements accepted by the NRC. The operations of the RCS system and CEDM cooling sub-system are unchanged from the current configuration in terms of operator burden and complexity of actions needed to operate both systems. The fabrication, construction, and analysis of the RCS and RBHV SSCs by this modification demonstrate that changes are acceptable and do not alter any of the design functions or affect the frequency of occurrence of a previously evaluated accident.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   The RB Containment, RCS system and supporting structures are the only systems important to safety affected by this modification. None of changes adversely impact the RB Containment, the RCS or its support systems. Double fusing has been installed in 2C22 circuits going into containment to eliminate penetration protection single point failure modes. All the other RCS and RBHV design functions have been maintained and/or demonstrated by analysis where needed. The likelihood of occurrence of a malfunction of a SSC important to safety is unchanged.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

   BASIS:

   The SAR has evaluated RCS leakage into the containment building. The LOCA accidents, as analyzed in the SAR, are not impacted by modification of the high point vent line, changing the pipe's supports, or other modification changes to the RCS structures. The modification maintains the RCS's ability to successfully respond to a seismic event and maintains the design of the RCS pressure boundary components. The modification does not impact any ECCS systems or other accident mitigating equipment. The assumptions made for the accidents reviewed in the SAR take no credit for the CEDM Cooling remaining functional, while the SSCs have been analyzed to perform their function during an OBE and DBE. The modification does not affect the containment's normal operating conditions (temperature, pressure, relative humidity, etc.) and initial conditions for accident analysis. The modification does not add design functions or reduce margin with respect to the Containment Building's ability to mitigate previously evaluated accidents such that a post accident off site dose release analysis is not adversely affected.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The existing analyzed accidents are from LOCAs or Seismic events and are unchanged by this modification. The modification affects the RCS system and supporting structures from the closure head up to the missile shield. The SAR has analyzed RCS leakage inside containment and there are no additional offsite dose consequences caused by this modification. The seismic structural qualifications of the Service Structure and Maintenance Structure have been maintained, which precludes increasing the consequences from a LOCA or seismic vent. The CEDM Cooling Shroud upgrade does not generate additional missiles. The high point vent line piping remains similar to the original run and designed using the same standards. The net result of the modification does not have an adverse affect on the sump analysis based on review of existing calculations of post accident sump performance. The modification does not affect the ability of the CEDM system to insert the CEAs into the reactor, the seismic design functions of the RCS system and structural supporting systems are maintained, and the ability of the Containment Building to mitigate an offsite dose release is not changed.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The bounding accidents applicable to this CEDM Cooling Shroud Upgrade are identified in SAR section 6.3. The small line break LOCA, and the large break LOCA analysis are the challenging accidents. RCS leakage inside containment is bounded by the small break LOCA, with the containment structure bounded by the more onerous large break LOCA; these two represent the primary and secondary bounding analysis that remain still bounding for the CEDM Cooling Shroud upgrade. The evaluated accidents in Chapter 15 of the U2 SAR are still bounding. The design functions and operating parameters of the safety and non-safety related SSCs are not changed by this modification and the existing accident analysis are still bounding, a new or different accident is not created by this modification.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The SAR has evaluated RCS leakage inside containment, seismic events, as well as many other accidents. The failure of the high point vent pipe is bounded with the evaluated small pipe break LOCA. The relocation of the flange pair on the high point vent line does not affect the venting function as credited in the EOPs. Failure of RCS piping, as evaluated in the SAR, remains bounded with the CEDM Cooling Shroud Upgrade to the reactor high point vent line flange relocation. The seismic qualification of the RCS, Maintenance Structure remains bounded by analysis as described in the SAR. The modification was reanalyzed in accordance with generally accepted methods and demonstrated those SSCs maintain their seismic capabilities. The CEDM cooling subsystem of the RBHV system is non-safety related and is not considered a non-safety related system whose failure could prevent a safety related system (CEDM system) from functioning. The LOCAs, Seismic Events, and loss of CEDM cooling have been previously analyzed. The modification addresses those postulated failures and indicates they are bounded by existing or new analysis. The RCS, RBVH, and CEDM systems will respond as previously evaluated to existing postulated failure modes.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

The pressure and stresses for the RCS system are not changed by the relocation of the reactor head vent line flange. The lack of change to the RCS, pressure and temperature, from the existing bounding design basis creates no change to the design basis analysis for the fuel cladding. The bounding analyzed design basis limit for the containment structure remains a LOCA. The CEDM Cooling Shroud upgrade does not affect control of the containment atmosphere (temperature, pressure of containment, humidity) as assumed for the initial conditions of an accident. No credit is taken for the CEDM Cooling in the RBHV post accident response and the CEA assemblies will still insert into the core and protect the fuel cladding. Therefore with no change to the bounding fuel cladding barrier, no change to the RCS design basis, and no change to the containment design basis limit, there is no increase to the design basis limit for fission product barriers due to this modification.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

All changes were made consistent with Siesmic Analysis methodology as described in the SAR. All changes to the reactor's high point vent line were done in accordance with the ASME code as described in the SAR. The installed double fusing inside the 2C22 cabinet was done consistently with SAR requirements for electrical penetration protection.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ANO 50.59 Evaluation Number

2005-012

I. OVERVIEW / SIGNATURES

Facility: ANO-2

Document Reviewed: A2-NE-2005-003, "Criteria for Failed ICI During Startup for ANO-2" and OP-2302.001, "Incore Detector Channel Check"

Change/Rev.: 0 and 012-04-0, respectively

System Designator(s)/Description: ICI

Description of Proposed Change:

Chapter 7 of the ANO-2 SAR provides the requirements for the operability of the ICI system. The Chapter 15, Fuel Misloading analysis makes assumptions concerning the operability of the ICI system. If there are additional ICI failures beyond that assumed in the analysis, then additional requirements for the operability of the ICI system is necessary in lieu of reperforming the appropriate analyses. This change adds these additional requirements to the SAR and implements these requirements in OP-2302.001, "Incore Detector Channel Check".

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	EDITORIAL CHANGE of a Licensing Basis Document	Section I
☐	SCREENING	Sections I and II required
☐	50.59 EVALUATION EXEMPTION	Sections I, II, and III required
X	50.59 EVALUATION (#:) FFN-05-012	Sections I, II, and IV required

Preparer: Robert W. Clark / [signature] / ENS / Safety Analysis / 04/05/05
Name (print) / Signature / Company / Department / Date

Reviewer: Charles R. Garke, Jr / [signature] / ENS / Reactor Engr. / 4/6/05
Name (print) / Signature / Company / Department / Date

OSRC: J.R. Eichenberger / [signature] / 4/7/05
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. **Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?**

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	X	
TS	☐	X	
NRC Orders	☐	X	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM ENS-LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	X		Section 7.7.1.1.7
TS Bases	☐	X	
Technical Requirements Manual	☐	X	
Core Operating Limits Report	☐	X	
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	X	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	X	
If "YES", perform an Exemption Review per Section III OR perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. AND initiate an LBD change in accordance with NMM ENS-LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	X	
Emergency Plan[2, 3]	☐	X	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	X	
Offsite Dose Calculations Manual[3, 4]	☐	X	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM ENS-LI-113. No further 50.59 review is required.			

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

2. **Does the proposed activity involve a test or experiment not described in the FSAR?** ☐ Yes X No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. **Basis**

Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Discuss other LBDs if impacted. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis.

BACKGROUND

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Section 15.1.15 of the ANO-2 SAR describes the Fuel Misloading event and the analysis of record for this event. The analysis of record allows for only one random failed in-core instrument (in additions to locations E8 and N8) during the startup testing (Section 4.5.3.2 of the ANO-2 SAR) for each cycle. With additional ICI failures, the results of the record of analysis could be invalidated. Specifically if multiple failed ICIs were located near a misloaded assembly then some misloads that could result in fuel damage may not be detected prior to full power operation. To prevent fuel damage either the required overpower margin (ROPM) must be substantially increased or alternate requirements on ICI operability must be imposed.

The proposed change provides the alternate requirements for the system.

OP-2302.001 is the procedure that implements the alternate requirements that are provided as the proposed change. This procedure has been revised to include the alternate requirements.

The proposed change provides a means to determine if specific failed ICIs might prevent the ICI system from detecting potentially limiting fuel assembly misloads. This is in lieu of an extensive revision to the analysis of record and potential increase in the COLSS ROPM. If the system can not meet the alternate requirements, the fuel misloading analysis is required to reperformed.

RESPONSES TO QUESTIONS

1. Licensing Basis Documents

a. Operating License

The operability requirements for the incore detector system are not addressed in the ANO-2 Technical Specifications. These requirements were removed from the Technical Specifications and relocated to the ANO-2 SAR several years ago.

The actual requirements for the operability of the ICI system are beyond the scope of the ANO-2 Operating License, Technical Specifications and the NRC Confirmatory Orders associated with ANO-2.

Based upon the above discussion, no changes to the ANO-2 Operating License, Technical Specifications or NRC Orders are required to support the operation of the Cycle 18 core.

b. LBDs Controlled Under 50.59

The ANO-2 SAR does contain the operability requirements for the incore detector system. The proposed change adds alternate requirements to these requirements to address multiple detector failures. An LDCR is prepared to document these changes.

The NRC's SERs associated with ANO-2 discuss the ability to provide tilt estimates via the incore detectors. They do not address the operability requirements that are provided in the ANO-2 SAR. The requirements to demonstrate operability of this system are beyond the scope of the SERs.

The operability requirements listed in the ANO-2 SAR are beyond the scope of the bases to the ANO-2 Technical Specifications and the Technical Requirements Manual (TRM).

No changes are required to the Technical Specification bases, NRC SERs, or the TRM. The ANO-2 SAR is being revised to add these alternate requirements.

c. LBDs Controlled Under Other Regulations

The operability limits (original or alternate ones) listed in the SAR is beyond the scope of the QAPM, ANO E-plan, Fire Protection Program, and the ODCM. Based on this, no changes to these documents are required to support the proposed change.

2. Test or Experiment

The implementation of these alternate requirements for the operability of the ICI system does not constitute testing or experimentation listed in the SAR. Any test that must be performed using the ICI system is described in Section 4.5 of the ANO-2 SAR.

4. **References**

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.5.1[5](d) of LI-101. NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.

LBDs/Documents reviewed via keyword search:	Keywords:
AUTONOMY – 50.59 – Unit 2	"power distribution"; "fuel symmetry"; "tilt estimates"; "fuel misload"; "ICI operability"; incore instruments operability"; "in-core instruments"

LBDs/Documents reviewed manually:

ANO-2 SAR - 4.5.3.2; 7.7.1.1.7; 7.7.1.3; 15.1.15

ANO-2 SER – 53; 151; 163

5. **Is the validity of this Review dependent on any other change?** ☐ Yes X No

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure ENS-EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	X	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	X	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	X	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	X	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	X	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	X	Discharge any chemicals new or different from that previously discharged?
7.	☐	X	Change the design or operation of the intake or discharge structures?
8.	☐	X	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	X	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	X	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	X	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	X	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	X	Involve the installation or modification of a stationary or mobile tank?
14.	☐	X	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	X	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure ENS-EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	X	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	X	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	X	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	X	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	X	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	X	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	X	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	X	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	X	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	X	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

(NOTE: This section is not applicable to Waterford 3 and may be removed from 50.59 Reviews performed for Waterford 3 proposed activities.)

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure ENS-LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	X	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	X	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	X	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	X	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	X	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	X	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	X	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	X	Involve a change to the Fuel Building electrical power?
9.	☐	X	Involve a change to the Fuel Building ventilation?
10.	☐	X	Involve a change to the ISFSI security?
11.	☐	X	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	X	Involve a change to spent fuel characteristics?
13.	☐	X	Redefine/change heavy load pathways?
14.	☐	X	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	X	Involve a change to the loading bay or supporting components?
16.	☐	X	New structures near the ISFSI?
17.	☐	X	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	X	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes X No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes X No

   BASIS:

   The alternate requirements for the operability of the incore detector system ensure that system is operated in a manner that is consistent with the assumptions used in the safety analysis for this cycle when there are multiple failures of the ICI detectors. These requirements affect only the operational status of the incore detector system and have no impact on the initiating event of any accident previously evaluated in the FSAR.

   No changes to plant equipment are required to implement these alternate requirements. As discussed above there are no impacts to any of the accident initiators due to the changes in the operational requirements for the ICI system. Therefore the proposed changes will not result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes X No

   BASIS:

   The proposed change only affects the requirements for operability of the ICI system ensures that the system is operated in a manner that is consistent with the assumptions used in the analyses for this core design. No changes in the assumptions concerning the structure, system or component important to safety availability or failure modes were made ~~in the reload core design.~~ The structures, systems or components will be maintained and operated within the design and licensing basis for ANO-2 and does not impact the function or duty of the supporting equipment. Based on the above discussion, the alternate requirements for the operability of the system will not result in more than a minimal increase in the likelihood of a structure, system or component important to safety malfunctioning.

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3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes X No

BASIS:

The additional requirements for the operability of the ICI system with several ICI failures ensures the ICI system is operated in a manner that is consistent with the assumptions used in the fuel misload analyses. The required actions, if these requirements are not met, are part of the proposed changes to the ANO-2 SAR. These actions include performing the appropriate analyses. Changing the requirements for this system does not result in a change in the evaluated consequences of accidents. These additional requirements are necessary for the system to be able to detect limiting fuel misloading conditions with additional failed ICIs. Therefore, the consequences of an accident previously evaluated in the FSAR will not be increased.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes X No

BASIS:

The proposed additional requirements for the operability of the ICI system does not require any changes to the assumptions concerning structure, system or component availability or failure modes. This document does not involve any changes in the structures, systems or components. In addition, the proposed changes do not impact the overall function or duty of the structures, systems or components important to safety. These operational requirements will not result in a change to the evaluated consequences of the accidents, which also include consideration of all relevant structure, system and component malfunctions. Therefore, the consequences of a malfunction of a structure, system or component important to safety will not be increased.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes X No

BASIS:

The additional operational requirements provided by the proposed changes will ensure that the ICI system is operated in a manner that is consistent with the assumptions used in the safety analyses. These changes do not create an additional failure mode than what has already been analyzed. No initiators to any of the accidents are impacted by this document. No new operating conditions or plant configurations are created that could lead to an accident of a different type than any previously evaluated in the FSAR. Based on the above, the possibility of an accident of a different type than any previously evaluated in the FSAR will not be created.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes X No

BASIS:

No changes in the failure modes of the structures, systems or components important to safety are assumed in the alternate requirements for the ICI system operability. No new operating conditions or plant configurations are created that could lead to a malfunction of structures, systems or components of a different type than any previously evaluated in the FSAR. Therefore, the possibility of a malfunction of a structure, system or component important to safety with a different result than previously evaluated in the FSAR will not be created by this document.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes X No

BASIS:

The additional requirements for determining the operability of the ICI system with multiple ICI failures will ensure that the system is operated in a manner that is consistent with the fuel misloading safety analysis assumptions. These requirements are such that the ICI system can detect potential limiting fuel misload conditions that could lead to fuel damage. These requirements do not impact any of the fission barriers or their design. Based on the above, these changes do not result in a FSAR described design basis limit for a fission product barrier being altered or exceeded.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes X No

BASIS:

The alternate requirements presented in the proposed changes were developed on the results of the current ANO-2 fuel misloading analysis of record and from experience from recent fuel loading analyses for other plants that are similar to ANO-2 that were performed by Westinghouse. Theses analyses of record were developed using NRC reviewed and approved methodologies.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ANO 50.59 Evaluation Number

2005-013

I. OVERVIEW / SIGNATURES

Facility: ANO-2

Document Reviewed: A2-NE-2005-003, "Criteria for Failed ICI During Startup for ANO-2" and OP-2302.001, "Incore Detector Channel Check"

Change/Rev.: 1 and 012-05-0, respectively

System Designator(s)/Description: ICI

Description of Proposed Change:

The purpose of the revision to the engineering report is to remove vulnerability to failure of a single detector string for all core locations, allow power ascension to continue to 70% power versus 68% shown in Revision 0 in the event of violation of a criterion listed in the report, and to add some clarifications to Table 1 in the enclosed document. This change adds these additional requirements and clarifications to the SAR and implements these requirements in OP-2302.001, "Incore Detector Channel Check".

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	EDITORIAL CHANGE of a Licensing Basis Document	Section I
☐	SCREENING	Sections I and II required
☐	50.59 EVALUATION EXEMPTION	Sections I, II, and III required
X	50.59 EVALUATION (#:) FFN-05-013	Sections I, II, and IV required

Preparer: Robert W. Clark / [signature] / ENS / Safety Analysis / 04/08/05
Name (print) / Signature / Company / Department / Date

Reviewer: TODD A. ERSKINE / Todd Erskine / ENS / RxEng / 4/8/05
Name (print) / Signature / Company / Department / Date

OSRC: J.R. Eichenberger / [signature] / 4/8/05
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	X	
TS	☐	X	
NRC Orders	☐	X	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM ENS-LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	X		Section 7.7.1.1.7
TS Bases	☐	X	
Technical Requirements Manual	☐	X	
Core Operating Limits Report	☐	X	
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	X	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	X	
If "YES", perform an Exemption Review per Section III OR perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. AND initiate an LBD change in accordance with NMM ENS-LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	X	
Emergency Plan[2, 3]	☐	X	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	X	
Offsite Dose Calculations Manual[3, 4]	☐	X	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM ENS-LI-113. No further 50.59 review is required.			

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

2. **Does the proposed activity involve a test or experiment not described in the FSAR?** ☐ Yes X No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. Basis

Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Discuss other LBDs if impacted. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis.

BACKGROUND

Section 15.1.15 of the ANO-2 SAR describes the Fuel Misloading event and the analysis of record for this event. The analysis of record allows for only one random failed in-core instrument (in addition to locations E8 and N8) during the startup testing (Section 4.5.3.2 of the ANO-2 SAR) for each cycle. With additional ICI failures, the results of the analysis of record could be invalidated. Specifically if multiple failed ICIs were located near a misloaded assembly then some misloads that could result in fuel damage may not be detected prior to full power operation. To prevent fuel damage either the required overpower margin (ROPM) must be substantially increased or alternate requirements on ICI operability must be imposed.

The alternate requirements listed in the ANO-2 SAR provided a means to determine if specific failed ICIs might prevent the ICI system from detecting potentially limiting fuel assembly misloads. This change removes the vulnerability to failure of a single string of detectors for all core locations. This is done by including an additional requirement for determining the operability of the ICI system. This proposed change will also allow power ascension to 70% versus 68% power if a constraint is not met. This will allow for the completion of the measurement of the Shape Annealing Matrix (SAM) during power ascension. Several clarifications were also made in the engineering report.

The proposed change provides the additional requirements and clarifications.

OP-2302.001 is the procedure that implements the additional requirements and clarifications that are provided as the proposed change. This procedure has been revised to include these requirements and clarifications.

RESPONSES TO QUESTIONS

1. Licensing Basis Documents

a. Operating License

The operability requirements for the incore detector system are not addressed in the ANO-2 Technical Specifications. These requirements were removed from the Technical Specifications and relocated to the ANO-2 SAR several years ago.

The actual requirements for the operability of the ICI system are beyond the scope of the ANO-2 Operating License, Technical Specifications and the NRC Confirmatory Orders associated with ANO-2.

Based upon the above discussion, no changes to the ANO-2 Operating License, Technical Specifications or NRC Orders are required to support the operability of the ICI system.

b. LBDs Controlled Under 50.59

The ANO-2 SAR does contain the operability requirements for the incore detector system. The proposed change adds additional requirements and clarifications to these requirements that already exist to address multiple detector string failures. An LDCR is prepared to document these changes.

The NRC's SERs associated with ANO-2 discuss the ability to provide tilt estimates via the incore detectors. They do not address the operability requirements that are provided in the ANO-2 SAR. The requirements to demonstrate operability of this system are beyond the scope of the SERs.

The operability requirements listed in the ANO-2 SAR are beyond the scope of the bases to the ANO-2 Technical Specifications, Core Operating Limits Report (COLR) and the Technical Requirements Manual (TRM).

No changes are required to the Technical Specification bases, NRC SERs, or the TRM. The ANO-2 SAR is being revised to include these additional requirements and clarifications.

c. LBDs Controlled Under Other Regulations

The operability limits for the ICI system listed in the SAR are beyond the scope of the QAPM, ANO E-Plan, Fire Protection Program and the ODCM. Based on this, no changes to these documents are required to support the use of the revised criteria.

2. Test or Experiment

The implementation of these alternate requirements for the operability of the ICI system does not constitute testing or experimentation listed in the SAR. Any test that must be performed using the ICI system is described in Section 4.5 of the ANO-2 SAR.

4. References

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.5.1[5](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
AUTONOMY – 50.59 – Unit 2	"power distribution"; "fuel symmetry"; "fuel misload"; "ICI operability"; "incore instruments operability"; "in-core instruments": "ICI"; incore NEAR10 operability

LBDs/Documents reviewed manually:

ANO-2 SAR - 4.5.3.2; 7.7.1.1.7; 7.7.1.3; 15.1.15

ANO-2 SER – 53; 151; 163

Previous LDB to Section 7.7.1.1.7 that was submitted on 04/08/05 (no number has been assigned at this time).

5. **Is the validity of this Review dependent on any other change?** ☐ Yes X No

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure ENS-EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	X	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	X	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	X	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	X	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	X	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	X	Discharge any chemicals new or different from that previously discharged?
7.	☐	X	Change the design or operation of the intake or discharge structures?
8.	☐	X	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	X	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	X	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	X	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	X	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	X	Involve the installation or modification of a stationary or mobile tank?
14.	☐	X	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	X	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure ENS-EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	X	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	X	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	X	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	X	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	X	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	X	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	X	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	X	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	X	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	X	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

(NOTE: This section is not applicable to Waterford 3 and may be removed from 50.59 Reviews performed for Waterford 3 proposed activities.)

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure ENS-LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	X	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	X	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	X	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	X	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	X	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	X	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	X	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	X	Involve a change to the Fuel Building electrical power?
9.	☐	X	Involve a change to the Fuel Building ventilation?
10.	☐	X	Involve a change to the ISFSI security?
11.	☐	X	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	X	Involve a change to spent fuel characteristics?
13.	☐	X	Redefine/change heavy load pathways?
14.	☐	X	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	X	Involve a change to the loading bay or supporting components?
16.	☐	X	New structures near the ISFSI?
17.	☐	X	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	X	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes X No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes X No

   BASIS:

   The requirement for the operability of the incore detector system being added by the proposed change removes the vulnerability of a failure of a single detector string for all core locations and provides some clarification to the existing operability requirements. This additional requirement and clarifications will ensure that the system is operated in a manner that is consistent with the assumptions used in the safety analysis for this cycle when there are multiple failures of the ICI detectors. The proposed change includes allowing power to escalate up to 70% power versus 68%. This will allow the completion of the Shape Annealing Matrix measurement. These requirements affect only the operational status of the incore detector system and upper operating limit in certain conditions. They have no impact on the initiating event of any accident previously evaluated in the FSAR.

   No changes to plant equipment are required to implement these additional requirements and clarifications. As discussed above there are no impacts to any of the accident initiators due to the changes in the operational requirements for the ICI system. Therefore the proposed changes will not result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes X No

   BASIS:

   The proposed change removes vulnerability in the current requirements for operability of the ICI system and provides clarification to some of the existing requirements. The upper limit of operability is also changed from 68% to 70%. These changes ensure that the system is operated in a manner that is consistent with the assumptions used in the analyses for fuel misloading events. No changes in the assumptions concerning the structure, system or component important to safety availability or failure modes were made. The structures, systems or components will be maintained and operated within the design and licensing basis for ANO-2. The proposed changes to ICI criteria do not impact the function or duty of the supporting equipment. Based on the above discussion, the alternate requirements for the operability of the system will not result in more than a minimal increase in the likelihood of a structure, system or component important to safety malfunctioning.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes X No

BASIS:

Additional requirements for the operability of the ICI system with several ICI failures were recently included in the SAR. These requirements ensure the ICI system is operated in a manner that is consistent with the assumptions used in the fuel misload analyses with additional failures of ICI detector strings. Another requirement is added with this change. This requirement addresses the issue of a single failure of a string of detectors for all core locations. The required actions, if these requirements are not met, are part of the ANO-2 SAR and are not being changed. These actions include performing the appropriate analyses or tests. Included with the proposed change is raising the upper limit in power if one of the requirements is met but not the others. Changing the requirements or clarifying the operability requirements for this system does not result in a change in the evaluated consequences of accidents. These additional requirements are necessary for the system to be able to detect limiting fuel misloading conditions with additional failed ICIs. Therefore, the consequences of an accident previously evaluated in the FSAR will not be increased.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes X No

BASIS:

No changes to the assumptions concerning structure, system or component availability or failure modes are required due to the addition of a requirement that reduces the vulnerability of the system to a failure of a single string of detectors in select locations in the core. No changes are required due to the clarifications to the existing operability requirements or the upper limit of operations under certain circumstances. These documents do not involve any changes in the structures, systems or components. In addition, the proposed changes do not impact the overall function or duty of the structures, systems or components important to safety. These operational requirements and clarifications will not result in a change to the evaluated consequences of the accidents, which also include consideration of all relevant structure, system and component malfunctions. Therefore, the consequences of a malfunction of a structure, system or component important to safety will not be increased.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes X No

BASIS:

The revised operational requirements provided by the proposed changes will ensure that the ICI system is operated in a manner that is consistent with the assumptions used in the safety analyses and removes a vulnerability to a single failure of a select subgroup of ICI detector strings. These changes do not create an additional failure mode than what has already been analyzed. No initiators to any of the accidents are impacted by this document. No new operating conditions or plant configurations are created that could lead to an accident of a different type than any previously evaluated in the FSAR. Based on the above, the possibility of an accident of a different type than any previously evaluated in the FSAR will not be created.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes X No

BASIS:

No changes in the failure modes of the structures, systems or components important to safety are assumed in the revised requirements or clarifications for the ICI system operability. No new operating conditions or plant configurations are created that could lead to a malfunction of structures, systems or components of a different type than any previously evaluated in the FSAR. Therefore, the possibility of a malfunction of a structure, system or component important to safety with a different result than previously evaluated in the FSAR will not be created by this document.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes X No

BASIS:

The revised requirements and clarifications to the existing requirements for determining the operability of the ICI system with multiple ICI failures will ensure that the system is operated in a manner that is consistent with the fuel misloading safety analysis assumptions. These requirements are such that the ICI system can detect potential limiting fuel misload conditions that could lead to fuel damage. These requirements do not impact any of the fission product barriers or their design. Based on the above, these changes do not result in a FSAR described design basis limit for a fission product barrier being altered or exceeded.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes X No

BASIS:

The additional requirements and clarifications presented in the proposed changes were developed based on the results of the current ANO-2 fuel misloading analysis of record and from experience from recent fuel loading analyses for other plants that are similar to ANO-2 that were performed by Westinghouse. These analyses of record were developed using NRC reviewed and approved methodologies.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ANO 50.59 Evaluation Number

2005-019

I. OVERVIEW / SIGNATURES

Facility: ANO-2

Document Reviewed: ER-ANO-2005-0316-000 **Change/Rev.:** 0

System Designator(s)/Description: CEDMCS / CPC / CEAC

Description of Proposed Change:

The proposed change will install a temporary alteration to supply a dummy CEA-20 position indication to CEAC #1 in place of the actual position indication supplied by RSPT #1. The proposed change impacts the CEAC #1 indication only and does not affect the CPC monitoring of target rod indications (RSPT #2 supplies CPC C with CEA 20 position indication). CEA-20 is part of shutdown bank B (subgroup #4).

Check the applicable review(s): **(Only the sections indicated must be included in the Review.)**

☐	**EDITORIAL CHANGE of a Licensing Basis Document**	**Section I**
☐	**SCREENING**	**Sections I and II required**
☐	**50.59 EVALUATION EXEMPTION**	**Sections I, II, and III required**
☒	**50.59 EVALUATION (#: FFN-05-019)**	**Sections I, II, and IV required**

Preparer: Todd A. Erskine / Todd Erskine / ENS / Reactor Engineering / 4-20-05
Name (print) / Signature / Company / Department / Date

Reviewer: Patrick J. Williams / [signature] / ENS / Engrmg / 4/21/05
Name (print) / Signature / Company / Department / Date

OSRC: J.R. Eichenberger / [signature] 4/21/05
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM ENS-LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	☒	☐	Sections 7.2.1.1.2.5, 7.5.1.4.2, Figures 7.2-14 & 7.2-32
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	☒	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	☒	
If "YES", perform an Exemption Review per Section III <u>OR</u> perform a 50.59 Evaluation per Section IV <u>OR</u> obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. <u>AND</u> initiate an LBD change in accordance with NMM ENS-LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2, 3]	☐	☒	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculations Manual[3, 4]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation <u>AND</u> initiate an LBD change in accordance with NMM ENS-LI-113. No further 50.59 review is required.			

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

2. **Does the proposed activity involve a test or experiment not described in the FSAR?** ☐ Yes ☒ No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. Basis

Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Discuss other LBDs if impacted. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis.

Does the proposed activity impact the facility or a procedure as described in the Operating License Documents? NO

The proposed temporary alteration does not contradict any requirements in the TS or Operating License documents. TS 3.1.3.2 and 3.1.3.3 state the requirements for RSPT indication operability in Modes 1 through 5. Both specifications allow for a single RSPT stack to be inoperable for any CEA. For the proposed change related to CEA-20, RSPT #1 will be inoperable. RSPT #2 as well as the CEA pulse counting position indicator channel will remain fully operable for CEA-20, satisfying the TS requirements. In the event of maintenance that impacts RSPT #2, CEA-20 will be maintained at the Upper Electrical Limit to maintain compliance with TS 3.1.3.2.

The TS and Operating License documents require operability of the CPC / CEAC system for purposes of calculating LPD and DNBR and providing trips when necessary. The CPC / CEAC system requires CEA position indication information from RSPTs in order to determine appropriate peaking factors for use in DNBR and LPD calculations. The proposed change does not impact the ability of CPCs or CEACs to conservatively assess DNBR / LPD relative to TS limits. Position indication information supplied to CPCs is not impacted by the proposed change because the RSPT #1 indication for CEA-20 does not supply any CPC with a target rod indication. The CPC's capability to determine CEA group position and detect deviations between subgroups is therefore unaffected. Position indication information supplied to CEAC-2 is not impacted by the proposed change because this CEAC only uses inputs from RSPT #2. Position indication information supplied to CEAC-1 will be impacted by the proposed change.

CEAC-1 will no longer be provided with a live indication of CEA-20's position due to inoperability of RSPT #1 for this CEA. The purpose of CEAC monitoring of CEA position indications is to detect deviations within a subgroup and supply appropriate penalty factors to CPCs for a deviation condition. With respect to CEA-20, CEAC-1 will conservatively indicate an outward deviation within subgroup #4 if the subgroup is inadvertently inserted with the proposed change in place. The conservative indication of outward deviation within subgroup #4 will result from CEA-20 having a fixed ~150" indication supplied to CEAC-1 while remaining CEAs continue to have live signals supplied. Should subgroup #4 be inserted beyond the deadband at the top of the core (upper deadband exists from greater than ~138 inches withdrawn), conservative penalty factors for a deviation within subgroup will be supplied to CPCs by CEAC-1 (a full plant trip would occur as well due to independent application of large planar radial peaking factors by individual CPCs on their own).

CEAC-1 will not detect inward deviations of CEA-20 alone due to a fixed ~150 inch withdrawn signal being continuously applied. This condition is not significant and does not impact TS or Operating License documents. The lack of ability of CEAC-1 to detect the inward deviation is mitigated by the fact that a deadband exists at the top of the core. Within this deadband, any deviation that occurs is ignored by the CPCs and CEACs. Should the CEA deviate inward beyond the deadband, CPC-C would sense the deviation as a deviation between subgroup #4 and the remaining subgroups for shutdown bank B and this channel would trip. CEAC-2, if in service, would similarly detect the deviation within subgroup #4 and apply appropriate penalty factors and alert the operators via the CEAC deviation alarm. These events would

trigger operations to act in accordance with the applicable LCOs. No further protective action would be necessary on the part of the CPC/CEAC system since this type of occurrence is mitigated by the initial DNBR/LPD margin available and not by PPS action (see SAR discussion below). In the event that CEAC-2 is out of service, CEA-20 will be maintained at the upper electrical limit such that inadvertent insertion could be detected by operators seeing the indicator light go off.

Note that TS 3.1.3.5 requires CEA-20 (and the remainder of shutdown bank B) to be maintained fully withdrawn except for surveillance testing (CEA exercising). Surveillance testing only requires movement of 5 inches in any one direction and will not result in CEAs being inserted beyond the deadband, thus removing any concern with operational impacts of the proposed change.

Based on the above, all position indication requirements as well as requirements for operability of CPCs, CEACs and assessment of DNBR / LPD will remain satisfied with the proposed change. Therefore, the proposed change does not impact the facility or a procedure as described in the Operating License documents.

Does the proposed activity impact the facility or a procedure as described in the documents controlled under 50.59? YES

The SAR contains design descriptions of the CEA position indications. These details include physical descriptions of how RSPTs stacks are configured around the CEDM pressure housing for each CEA, how the RSPT signals are routed through various connections and ultimately how RSPT signals are connected to the CPCs and CEACs. Beyond the RSPT indications, the SAR describes the separate pulse counting indication system and that this system is utilized to support plant computer (and COLSS) functions. The SAR contains details of the monitoring and protective functions relying on each of the available position indications.

Section 7.2.2.1.1 of the SAR discusses the anticipated operational occurrences (AOOs) that were used to determine RPS system design requirements. Among these AOOs, those that are related to CEA position indication and the proposed change include:

- Insertion or withdrawal of CEA groups (uncontrolled withdrawals, out of sequence conditions, excessive insertion).
- Insertion or withdrawal of CEA subgroups (uncontrolled insertions or withdrawals, subgroup drops, subgroup misalignments).
- Insertion and withdrawal of a single CEA (uncontrolled insertion or withdrawal, CEA drop, stuck CEAs, misaligned CEAs).

Section 7.2.1.1.2.5 describes the core protection calculators. The control element assembly calculators are included in the scope of this section. This section states that the following calculations (related to CEA positions and the proposed change) are performed in the CPC and the CEACs:

- CEA group and subgroup deviations, single CEA deviations (i.e., group out of sequence, deviation between subgroups or deviations of individual CEAs within a subgroup).
- Fuel rod and coolant channel planar radial peaking factors (selection of predetermined coefficients based on CEA position).
- CEA deviation alarm.

The above calculations of group, subgroup and individual CEA deviation, as well as the selection of planar radial peaking factors directly affect the calculation of DNBR and LPD made by the CPCs. From the above items, the CEACs calculate individual CEA deviations from the position of other CEAs in a subgroup. The CPCs determine the remaining parameters and apply additional penalties resulting from any CEAC detected deviations within subgroups. As shown on SAR Figure 7.2-32, RSPT #1 supplies indications to CEAC-1 as well as CPC channels A & B. RSPT #2 supplies indications to CEAC-2 as well as CPC channels C & D. Figure 7.2-32 also shows that for either of the two RSPT stacks, 41 indications are connected directly to a CEAC input and not used by CPCs. Design information not contained in the SAR confirms that the RSPT #1 indication for CEA-20 is one of the 41 indications connected directly (and only) to CEAC-1.

Since the RSPT #1 indication for CEA-20 is only an input to CEAC-1, the ability of the CPCs to detect CEA group deviations (i.e., out of sequence conditions) and deviations between subgroups is not affected by the proposed change. The CPC's capability to determine appropriate planar radial peaking factors based on CPC target rod indications is unaffected. The only function at issue is the CEAC-1 capability to detect a deviation within subgroup and supply the appropriate penalty factor to CPCs. The proposed change will fix the position of CEA-20 sensed by CEAC-1 at ~150 inches withdrawn. With respect to the above listed calculations and responses to AOOs, the impact of the proposed change will be:

- Insertion or withdrawal of CEA groups: Conservative system response. These AOOs are assessed by CPCs alone and do not rely on CEACs. However, CEAC-1 would conservatively sense that CEA-20 would remain withdrawn when the remaining CEAs in the subgroup were inserted and apply a conservative penalty factor to CPCs if the subgroup inserted beyond the deadband.
- Insertion or withdrawal of CEA subgroups: Same result as with insertion or withdrawal of CEA groups.
- Insertion and withdrawal of a single CEA: Conservative system response. Uncontrolled withdrawals are eliminated from needing consideration since CEA-20 is part of shutdown bank B Shutdown bank B is required by TS to remain withdrawn while critical. Uncontrolled insertions of CEA-20, including CEA drop or inadvertent insertion of CEA-20 beyond the deadband will be detected by CPC C using the redundant position indication available from RSPT #2. CEAC-2 will similarly detect the deviation within the associated subgroup and apply appropriate penalty factors when the deadband is exceeded. CPC C detection will cause the channel to trip, alerting the operators. CEAC-2 would alert the operators through the CEA Deviation alarm. In the event of maintenance impacting CEAC-2 (RSPT #2), CEA-20 will be maintained at the upper electrical limit where inadvertent insertion would be indicated by the UEL light going off.
- Planar Radial Peaking Factor determination: The planar radial peaking factors will continue to be determined correctly by CPC C using the operable RSPT #2 indication. Similarly, the ability of CEAC-2 to supply penalty factors for application to the CPC planar radial peaking factors is not impacted. In the event of maintenance impacting CEAC-2 (RSPT #2), conditions that would warrant a change in peaking factor due to CEA-20 position will be restricted (i.e., CEA-20 will be maintained at the UEL).
- CEA deviation alarms: As discussed above, the capability of CEAC-2 to activate a CEA deviation alarm based on RSPT #2 indications is maintained. This alarm function will not exist when CEAC-2 is out of service for maintenance or testing. In the event of maintenance impacting CEAC-2 or RSPT #2, CEA-20 will be maintained at the UEL to compensate for the lack of an operable deviation alarm.

Regarding the Chapter 15 events and the above described system response, the CEA misoperation event clearly states that penalties for single inward deviations have been removed and that "operator action is credited to mitigate these events." Therefore, the reliance on operator monitoring of an upper electrical limit indication to detect inward deviation of CEA-20 when CEAC-2 is out of service does not contradict the safety analyses. In fact, operating in this manner is consistent with the actions outlined in TS 3.1.3.2 and the basis for the NRC's approval of Amendment 208. Note that CPCs will continue to provide protection, as designed and described in the SAR, should the CEA be inserted beyond the deadband. The CEA misoperation event presented in SAR Section 15.1.3 is a full length CEA drop. The consequences of this event are not impacted by the proposed change since the event relies on adequate initial DNBR and LPD margin for protection and not CPC / CEAC trips.

Based on the above, with the proposed change in place, SAR Figures 7.2-14 and 7.2-32 will not be completely accurate. Figure 7.2-32 in particular, indicates 41 signals are directly connected between RSPTs and CEAC-1. The proposed change will reduce this number to 40. Both figures do not include the detail of the dummy indication that will be used to supply a "pseudo" RSPT indication to CEAC-1. In addition to these figures, the normal CEAC-1 indications for the presence of a failed sensor will not be present once the dummy signal is connected in place of the actual RSPT signal. Finally, the SAR describes the existence of a CEAC CEA deviation alarm (Section 7.5.1.4.2) that will not be available (with respect to CEA-20) when CEAC-2 is out of service.

The remaining documents controlled under 50.59 are not sufficiently detailed to be impacted by the proposed change. Due to the temporary nature of the proposed change, no LBD changes are being made as a result of this screening / evaluation. This decision was confirmed to be acceptable with Licensing.

Does the proposed activity impact the facility or a procedure as described in the documents controlled by other regulations? NO

CEA position indications and the design and operation of the CEAC / CPC system are beyond the level of detail contained in the QAPM, Fire Protection Program, E-Plan and ODCM documents.

Does the proposed activity involve a test or experiment not described in the FSAR? NO

The proposed activity compensates for the adverse impact of an inoperable instrument and does not constitute testing or experimentation.

4. References

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.5.1[5](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
LRS – 50.59 Unit 2	**RSPT, "cea position", deviation w/20 *group, cea w/20 sequence, "reed switch", "sensor failure", deviation w/20 alarm, RSPT w/20 CEAC, position w/20 CEAC, position w/20 "assembly calculator"**

LBDs/Documents reviewed manually:

U2 TS (3.1.3.1, 3.1.3.2, 3.1.3.3, 3.1.3.5, 3.1.3.6, 3.3.1.1, Tables 3.3-1 & 4.3-1)

U2 SAR (4.2.3.2.1, 4.3.2.2.1, 7.2.1.1.2.2, 7.2.1.1.2.5, 7.2.2.1.1, 7.5.1.4.1, 7.5.1.4.2, 7.5.2.4, 7.7.1.3.3.3, 7.7.1.4, 15.1.2, 15.1.3, Tables 7.2-5 & 7.2-13)

U2 COLR (All)

U2 SERs (Amendment 208)

U2 SAR Figures (7.2-14, 7.2-32)

5. **Is the validity of this Review dependent on any other change?** ☐ Yes ☒ No

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure ENS-EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure ENS-EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING
(NOTE: This section is not applicable to Waterford 3 and may be removed from 50.59 Reviews performed for Waterford 3 proposed activities.)

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure ENS-LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	☒	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	☒	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	☒	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	☒	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	☒	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	☒	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	☒	Involve a change to the Fuel Building electrical power?
9.	☐	☒	Involve a change to the Fuel Building ventilation?
10.	☐	☒	Involve a change to the ISFSI security?
11.	☐	☒	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	☒	Involve a change to spent fuel characteristics?
13.	☐	☒	Redefine/change heavy load pathways?
14.	☐	☒	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	☒	Involve a change to the loading bay or supporting components?
16.	☐	☒	New structures near the ISFSI?
17.	☐	☒	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	☒	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below.

☐ Yes
☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

The proposed change to dummy in a fixed RSPT signal for CEA-20 does not in any way impact the CEDMCS system's ability to move or hold the CEA. The requirement to maintain CEA-20 at the Upper Electrical Limit when CEAC-2 will be out of service may require more movement of CEA-20 than would otherwise take place. However, considering that this is an expected action for complying with TS 3.1.3.2 and that movement of the CEA would normally take place for purposes of periodic exercising and positioning per programmed insertion limits, the proposed change is not considered to result in more than a minimal increase in frequency of occurrence of any accident (such as CEA mis-operation) evaluated in the FSAR.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

The proposed change does not affect the reliability of the CEDMs, the CEAs, CPCs or CEACs. The installation of the temporary alteration will mimic the RSPT signal that is normally provided to CEAC-1. The signal provided will be within the normal range of CEAC inputs. If the input signal fails or leaves the normal range of CEAC inputs, the CEAC will continue to function as designed for conditions in which a sensor has failed. The system will continue to function as required to satisfy the safety analyses.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

The proposed change results in no higher dose consequences for any accident than have been previously evaluated. The only accident analysis at issue for the proposed change is the CEA mis-operation event. Group insertions (out of sequence) are adequately covered by CPC monitoring of additional subgroups of shutdown bank B. Consequences of these events are not impacted by the proposed change. Uncontrolled withdrawal while critical (group or CEA-20 individually) is eliminated from consideration due to this CEA being in shutdown bank B and the entire group remaining withdrawn at all times while critical. The uncontrolled CEA withdrawal event is not applicable to shutdown bank B CEAs when subcritical due to administrative controls in place that limit RCS boron concentrations when TCBs are closed. Inadvertent insertion of CEA-20 while critical (including CEA drop) would either be detected by CPC C, CEAC-2 or by Operators monitoring the status of UEL indications for the CEA. In either case, the consequences remain bounded by the CEA drop analysis that relies on initial DNBR / LPD margins and operator actions for mitigation, not protective actions by CPC / CEAC.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

As discussed in the response to question #3 above, the proposed change results in no higher dose consequences for any accident than what has already been evaluated. The CEA mis-operation analysis remains bounding for the proposed change. Beyond CEA mis-operation events, the proposed change has no impact on the CPC / CEAC system to respond as designed and required by the accident analyses. The consequences of CPC / CEAC or CEA malfunctions are no more severe with the dummy RSPT signal applied than with a normal live input.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The application of a dummy RSPT signal for a shutdown bank CEA in place of a live signal does not introduce any new accident initiator or result in the CPC/CEAC system operating in a different fashion than would normally be the case. The CPC/CEAC system includes in its design, the capability to accommodate sensor failures. Failure of the dummy signal would be perceived by and acted upon in the same manner as the CPC/CEAC system currently treats actual failures of RSPT inputs. The proposed change has no potential for creating additional accidents of a similar frequency or magnitude as those currently contained in the licensing basis.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The application of a dummy RSPT signal for a shutdown bank CEA in place of a live signal does not introduce any new accident initiator or result in the CPC/CEAC system operating in a different fashion than would normally be the case. No new failure modes are created for the system. The CPC/CEAC system includes in its design, the capability to accommodate sensor failures. Failure of the dummy signal would be perceived by and acted upon in the same manner as the CPC/CEAC system currently treats actual failures of RSPT inputs.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

As discussed previously, the consequences of the CEA mis-operation events remain bounding with application of the proposed change and the CPC/CEAC system's response to other accidents remains unchanged. As such, the CPC/CEAC system continues to satisfy all requirements for protecting against design basis events. This provides assurance that the design basis limits for fission product barriers described in the FSAR will not be exceeded. The proposed change does not alter these limits in any way.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

The proposed change does not relate to an analytical methodology used to demonstrate compliance with required design bases.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ANO 50.59 Evaluation Number

2005-021

I. OVERVIEW / SIGNATURES

Facility: ANO - Common

Document Reviewed: ER-ANO-2002-1078-010, ANO-1 SG/RVCH Replacement –Rigging and Handling Outside Reactor Building **Change/Rev.:** 0

System Designator(s)/Description: YARD

Description of Proposed Change

ER-ANO-2002-1078-010, "ANO-1 SG/RVCH Replacement – Heavy Components Rigging and Handling Outside Reactor Building," performs the design and programs for the implementation activities to temporarily install and use an Outside Lift System (OLS) for the Steam Generator Replacement (SGR) and Reactor Vessel Closure Head (RVCH) Replacement Project and an Outside Hatch Transfer System (OHTS). The OHTS and the OLS will be used to rig, move horizontally, and lower the Original Once Thru Steam Generators (OOTSGs) and Original RVCH (ORVCH) and its Original Service Structure (OSS) following their removal from the Reactor Building via the Reactor Building Opening created by ER-ANO-2002-1078-007. These components will be moved laterally through the Reactor Building Opening and then be lowered onto an awaiting self-propelled modular transporter (SPMT) where they will be transported under the implementation scope of ER-ANO-2002-1078-009, "Heavy Components Offload, Transport, and Haul Routes" to the specially constructed Unit 1 Original Steam Generator Storage Facility (OSGSF). The ORVCH/OSS will be up-ended once it has been moved out of the building so that it can be lowered to the SPMT. Radiological concerns and direction will be handled by EOI personnel as determined in ER-ANO-2002-1078-015 for the OOTSGs and ER-ANO-2002-1078-017 for the ORVCH.

The OLS and OHTS will be used to separately raise the Replacement Once-Thru Steam Generators (ROTSGs) and Replacement RVCH (RRVCH) and its Replacement Service Structure (RSS) from their servicing SPMT into the Reactor Building. The down-ending/up-ending of the RRVCH/RSS is analyzed and evaluated for acceptability. All necessary precautions needed during movement will be taken to assure no damage is done for this portion of the movement of the components into the Reactor Building.

The OHTS will consist of a supported beam system at elevation 401'-6" that spans between the outside support towers at the west end and Reactor Building wall on the east end. Skid tracks will be mounted to these beams, and will employ hydraulically-operated push-pull units along with saddles, tailing devices, and other rigging attachments to appropriately support the SG and RVCH components and accomplish their lateral movements. The drop analysis in ER-ANO-2002-1078-009 bounds the drop of components with the OLS.

A temporary Reactor Building Opening Work Platform (RBOWP), which in addition to assisting with rigging/handling/staging of other project materials/items, will be used to provide equipment and personnel access to the Reactor Building outside wall area during cutting, preparation and restoration of the Reactor Building Opening (RBO) implemented under ER-ANO-2002-1078-007. Both the OHTS and the RBOWP will be anchored to the Reactor Building for lateral stability using attachments that have been evaluated for acceptability to ensure that their use results in no adverse structural effect upon the Reactor Building. Upon removal of the outside Reactor Building rigging and handling equipment, these attachments will be removed, and the Reactor Building wall will be restored to an acceptable configuration. The hydroblasters will be supported by the RBOWP during modes 1 through defueled for the removal of the concrete opening. They are approximately 30-ft tall and move around on the platforms. The RBOWP and the hydroblasters are not over the EFW suction lines from the QCST but are in the proximity during modes 1 through 4 when these lines are needed for their safety related function. This are addressed in the 10 CFR 50.65 (a) (4) evaluation in this ER.

Mobile cranes will be used to perform the majority of rigging and handling activities necessary to erect and dismantle the OLS, OHTS, and RBOWP, as well as performing other equipment rigging and handling to support project activities. A 10 CFR 50.65(a)(4) evaluation is performed in this ER to identify and assess the risk of mobile crane use and other temporary II/I issues as noted above for the hydroblasters and the RBOWP, and to demonstrate acceptable management of this risk with respect to the structures, systems, and components (SSCs) present within the zone potentially affected by crane use. The QCST (T-41B) presently serves as a backup Q condensate source to Unit 2 which is expected to be in mode 1 during the Unit 1 SGR activities. The QCST is in the proximity to the temporary equipment for the SGR and is evaluated in the 10 CFR 50.59 evaluation. Unit 2 will maintain the 2T-41A and 2T-41B CST tanks within Tech Spec requirements when equipment is in place for the Unit 1 SGR to provide redundancy.

Mobile cranes will be used for rigging and handling of replacement horizontal and vertical tendons and the associated equipment used to perform the tendon installation. Tendon work on buttress #2 (Azimuth 180^0) and buttress #3 (Azimuth 300^0)of the Reactor Building will employ two (2) construction work platforms supported by fixed gantry type rigs on top of the Reactor Building. The gantry cranes (L28s) will be used to move supplies and materials to buttress #1 (Azimuth 60^0) after the materials have been placed on the roof by the mobile cranes. The work on the Buttress #1 during mode 1 through 4 will be accomplished using small platforms supported from the gantry cranes (L28s). This work includes removing the one hoop tendon removed during mode 1 and the removal and replacement of the tendon cans on the hoop tendons to degrease the ends. (A vertical tendon will also be removed at the same time from the construction opening area from the Reactor Building Dome). During modes 5 and 6 the small platforms will be used to remove the tendons that run through the construction opening. During modes defueled, 6, and 5 after the purge duct has been moved (Ref. ER-ANO-2002-1078-018.), larger platforms will be used to detension/retension the remaining hoop tendons. The large platforms will also be used to install and tension the new tendons running through the construction opening, and regreasing all of the hoop tendons that were tensioned. All of the tendon access platforms are supported by two suspension cables and have bumpers installed to keep them away from the building wall. This will assure that the platforms will not fall even if one cable should fail. The bumpers on the platforms and the insulation around the EFIC lines will prevent damaging the EFIC lines should the platforms come in contact with them.

A mast climber will be located adjacent to the Reactor Building next to buttress #2 (Azimuth 180^0) and will be used to transport personnel to the top of the Reactor Building. Attachment points will be designed for normal operating conditions and seismic conditions, and a temporary cable restraint system will be used to contain the mast climber to a Safe Collapse Zone for seismic and tornado events. Once the mast climber has been removed at the conclusion of the SGR/RVCH Replacement outage, the Richmond threaded inserts will be regrouted and the concrete anchors used to attach its bracing to the Reactor Building will be cut, driven into the concrete, and grouted to restore the Reactor Building to acceptable configurations.

The liner plate will be cut and welded back in place by ER-ANO-2002-1078-007. The liner plate will be removed/replaced with the mobile crane from the construction opening with the liner supported on a special frame designed according ASME B30.20 as part of ER-ANO-2002-1078-010. The line plate lifts will be a class B lift with special attention due to its configuration and lifting device. It will be moved out and into place during the defueled mode.

Although the OLS, OHTS, and associated supporting structures are designed to be temporary and fully removable at the completion of the SGR and RVCH replacement outage, the footings for the OLS towers and the OHTS supporting structures will be left permanently in place in an acceptable as-left configuration. For these as-left footing configurations, ER-ANO-2002-1078-010 demonstrates that no adverse effects upon associated Structures, Systems, or Components (SSCs) are experienced.

The OLS, OHTS, RBOWP, mast climber, and their temporary supporting structures are designed to minimize the number of physical interferences to their temporary installation and use. Interferences encountered for the installation of the equipment are addressed separately in ER-ANO-2002-1078-018, "ANO-1 SG/RVCH Replacement- Interferences- Civil/Mechanical/Electrical." The OLS and OHTS are designed to not block access to the equipment hatch during their installation and use, although during certain lifts and OLS/OHTS operation, the areas below and adjacent to the equipment hatch may be restricted in the interest of personnel safety.

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	**EDITORIAL CHANGE of a Licensing Basis Document**	**Section I**
☐	**SCREENING**	**Sections I and II required**
☐	**50.59 EVALUATION EXEMPTION**	**Sections I, II, and III required**
☒	**50.59 EVALUATION (#: FFN-05-021)**	**Sections I, II, and IV required**

Preparer: Doyle G. Adams/ Doyle G. Adams /EOI/ANO-1 SG/RVCH Replacement Project/5/2/05
Name (print) / Signature / Company / Department / Date

Reviewer: Wayne R Wasser/ /Adecco Technical/ ANO-1 SG/RVCH Replacement Project/5/2/05
Name (print) / Signature / Company / Department / Date

OSRC: J. R. Eichenberger 5-2-05
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings (see Section 5.8) and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	☒	☐	See Section II.A.3.
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	☒	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	☒	
If "YES", perform an Exemption Review per Section III OR perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. AND initiate an LBD change in accordance with NMM LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2, 3]	☐	☒	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculations Manual[3, 4]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM LI-113. No further 50.59 review is required.			

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

2. **Does the proposed activity involve a test or experiment not described in the FSAR?** ☐ Yes ☒ No

If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. **Basis**

Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Discuss other LBDs if impacted. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis. See EOI 50.59 Guidelines Section 5.3.2 for guidance.

Basis for Section II.A.1:

LI-101, Section 5.3 states that *a temporary alteration in support of the maintenance which is expected to be in effect during at-power operations for more than 90 days, a 50.59 would be applied to the temporary alteration in the same manner as a permanent change.* The installation and rigging on the outside of the ANO-1 reactor building is considered a common activity for both units since there is potential to damage equipment associated with ANO-2 while it is at power. This rigging will be in effect for on or about 90 days during the 1R19 outage. Even though the rigging activity is classified as maintenance in support of the installation of the ROTSG and RVCH, it is being addressed as a physical change and a 50.59 Evaluation is being performed due to the heavy load drop potential. Mobile crane and other temporary equipment failure is being addressed under a 50.65 Evaluation consistent with LI-101, section 5.3 which states: *Maintenance activities are activities that restore SSCs to their as-designed condition, including activities that implement approved design changes. Maintenance activities are subject to the provisions of 10 CFR 50.65(a)(4) and not 10 CFR 50.59.*

The design and implementation activities of ER-ANO-2002-1078-010 to support the changeout of the RVCH/SS and OTSGs for ANO Unit 1 themselves fully comply with the ANO Operating License, Technical Specifications, and NRC Orders, and therefore have no impact to these Licensing Basis Documents. This is a temporary installation and use of the OLS, OHTS, RBOWP, and construction elevator are designed and controlled for implementation by ER-ANO-2002-1078-010 to have no detrimental actual or potential effect upon any plant SSCs. The only permanent components within the package is the footings for the OLS and OHTS that are left in place at completion of the work and the anchor bolts used to attach the equipment to the side of the Reactor Building, none of which affects the licensing basis documents. (Upon removal of the temporary components, anchor bolts will be cut, driven in the concrete, and grouted.) Accordingly, there are no required changes to the FSAR, Technical Specifications Bases, and Technical Requirements Manual. Outside Reactor Building installation and use of these construction aids are mutually exclusive and independent of the Core Operating Limits Report. No citation was discovered from the search of NRC Safety Evaluation Reports by performing a Licensing Document Research System (LDRS) Common 50.59 Search which would be in conflict with the activities implemented by ER-ANO-2002-1078-010.

Outside Reactor Building rigging and handling of the new RRVCH/RSS and ROTSGs are performed in a manner that maintains the quality and integrity of these components. For the ORVCH/OSS and OOTSGs, which are classified as large contaminated equipment removed in a non-routine maintenance operation, measures are taken to confine and control any potential environmental release prior to these components exiting the Reactor Building. Rigging and handling will maintain manufacturer requirements for the RRVCH/RSS and ROTSGs. Thus, ER-ANO-2002-1078-010 complies with the ANO Quality Assurance Program Manual.

The ANO Site Emergency Plan involves various site equipment and facility availabilities for its proper execution. A manual review of the ANO Site Emergency Plan concluded that no adverse effects would be experienced from the design and implementation of ER-ANO-2002-1078-010. All Project participants will comply with site procedures and administrative requirements associated with Emergency Plan implementation (e.g., informational training of Project personnel for site assembly events, site evacuation, etc.). Outside Reactor Building rigging and handling of the ORVCH/OSS, RRVCH/RSS, ROTSGs and OOTSGs, as implemented by ER-ANO-2002-1078-010, have no adverse effect upon the site evacuation capability or the necessary movement/use of event-responding equipment over the ANO site. Similarly, the fire protection system as described in the Emergency Plan and ANO Fire Protection Program (including the Fire Hazards Analysis) is not impaired through rigging and handling of these RVCH and SG components outside the Reactor Building.

Prior to their outside Reactor Building rigging, handling, and transport, the ORVCH/OSS and the OOTSGs are prepared to confine/encapsulate/affix any contained/adhered radiological contamination in accordance with site radiation control requirements for large contaminated equipment removed in a non-routine maintenance operation. These component preparation activities are implemented for the OOTSGs under ER-ANO-2002-1078-015, "ANO-1 SG/RVCH Replacement – OTSG Prep, RCS Piping and Supports;" and for the ORVCH/OSS under ER-ANO-2002-1078-017, "ANO-1 SG/RVCH Replacement – RVCH Shielding." A radiation dose analysis was performed to evaluate the postulated radiological effects from a postulated drop of an OOTSG and ORVCH/OSS in the unlikely event of failure of rigging and handling equipment. This analysis, performed by Calculation No. ANO-ER-04-007, "ANO-1 SG/RVCH Replacement – X/Q OTSG & RVCH Drop Analysis," concluded that the worst case postulated radiological dose release results would be well within the regulatory requirements for offsite dose to the public at the Exclusion Area Boundary (EAB) and for dose to the control room operators. These dose values were also a fraction of the similar radiological release accident of a Waste Gas Tank Rupture (Reference: Unit 1 UFSAR Section 14.2.2.7 and Unit 2 UFSAR Section 15.1.16) of 0.5 Rem total body exposure during a 2-hour period at the EAB.

SSCs in proximity to the cranes, lifting equipment, and other temporary equipment (such as the hydroblasters and the RBOWP) were evaluated to address their implementation risks during the outage. These included but were not limited to the following: QCST, T-41B (evaluated for both ANO-1 and ANO-2 impacts); the ANO-1 and ANO-2 pipe chases from T-41B; ANO-1 Borated Water Storage Tank (BWST), T-3; ANO-1 Sodium Hydroxide Storage Tank, T-10; ANO-2 Refueling Water Tank, 2-T3; Underground Diesel Oil Red and Green Train EDG Day Tank Supply; the underground bus duct for power to the day tank transfer pumps, and the Reactor Building. The 10CFR50.65 evaluation in this package addresses the possible impacts and identifies the measures in place to limit the risks to these SSCs. The guidance used to determine the division between issues falling into 10 CFR 50.59 or 10 CFR 50.65 is the following:

50.59	Heavy loads and temporary plant conditions existing over 90 days at power
50.65	temporary plant conditions and seismic class II adjacent to seismic class I existing less than 90 days at power (except heavy loads)

Basis for Section II.A.2:

ER-ANO-2002-1078-010 involves only the rigging and handling structures and equipment needed to move the steam generators and the reactor vessel heads/support structures out and into the Reactor Building and does not involve changes that would be considered tests or experiments under 10 CFR 50.59 i.e., unanalyzed system alignments or changes that could affect the capability of SSCs to perform their intended design functions (e.g., high flow rates, high temperatures).

Background Information for Answers to Section II.B, Environmental Screening:

The Environmental Screening contained in Section III of this 50.59 Review yielded positive responses for Items 11 (Air Quality Effects due to Hydrocarbon Burning) and 14 (Use of Oils/Chemicals). Accordingly, an Environmental Evaluation will be prepared by ANO Environmental Engineering Staff to address these issues. For background purposes, the following information is presented:

- Item 11 – (Air Quality Effects due to Hydrocarbon Burning) – Outside Reactor Building rigging and handling of the steam generator and RVCH components involves diesel-powered equipment (cranes and hoists). However, temporary construction aid equipment of this type is not applicable to the environmental issue of air quality effects per EN-S NMM Procedure EV-117. As a matter of good project practice, no open burning will be permitted as part of project operations.

- Item 14 – (Use of Oils/Chemicals) – Outside Reactor Building rigging and handling of the steam generator and RVCH components involves equipment that utilizes oils (hydraulic, lubricating, diesel fuel) in small amounts, as compared to the large tank storage amounts of oils/chemicals that the Item 14 question was intended to address. As a matter of good project practice, proper maintenance and frequent inspection of this equipment throughout onsite use are performed. As a responsible operator of such equipment, SGT will have in place contingency response plans to deal environmentally with any unanticipated leakage. Onsite project storage and use of chemicals will comply with ANO site requirements for the same.

4. <u>References</u>

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.4.1[5]](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

	Keywords, as adapted:
LRS – 50.59 Common	Rigg*, "load path", "load paths", "heavy load", "heavy loads", "load handling", nureg*0612, condensate, EFW, "emergency feed", "emergency feedwater", T*41*B, T*41, T*137, "acid tank", T*138, "caustic tank", (red OR green) w/5 train*, "duct bank", "duct banks", pip* w/5 trench*, nitrogen*, diesel w/10 (pip* OR line* OR duct*), *HBD*, *HCC*,
LRS – 50.59 Unit 1	"reactor building", "containment", concrete w/20 anchor*, "equipment hatch", T*10, "sodium hydroxide", T9, T-9, "sodium thiosulfate", T*12*, "clean waste" w/5 tank*, "spent fuel" w/20 (drop* OR load* OR heavy)

LBDs/Documents reviewed manually:

1. ANO Unit 1 Final Safety Analysis Report, Sections 5.1.4.2, 5.1.5, 5.2.1, 9.8.3, 10.4.8, and 14; Figure 6-1
2. ANO Unit 2 Final Safety Analysis Report, Sections 1.2.2.10, 2.1.2, 3.6.4.5.1.3.2, and 15.
3. ANO Unit 1 Technical Specifications 3.5.4, 3.6.6, 3.7.6, 3.8
4. ANO Unit 2 Technical Specifications 3.5.4, 3.7.1.3, 3.8

5. **Is the validity of this Review dependent on any other change?** (See Section 5.3.4 of the EOI 10 CFR 50.59 Program Review Guidelines.)

☐ Yes
☒ No

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☒	☐	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☒	☐	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☒	☐	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☒	☐	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☒	☐	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☒	☐	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

ER-ANO-2002-1078-007, "ANO-1 SG/RVCH Replacement – Reactor Building Opening," is designated as the design and implementation vehicle for addressing plant security concerns and issues that result from the breach of the Reactor Building security boundary and use of this opening for passage of the SG and RVCH components and other items/materials/personnel out of and into the Reactor Building.

The Yes blocks marked above are for the temporary changes that will occur due to the various equipment lay down, the equipment movements, and temporary removal or blockage of security barriers, etc. by the activities of this ER. The OLS, OHTS, and RBOWP are designed to not block access to the equipment hatch during their installation and use, although during certain lifts and OLS/OHTS operation, the areas below and adjacent to the equipment hatch may be restricted in the interest of personnel safety.

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	☒	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	☒	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	☒	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	☒	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	☒	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	☒	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	☒	Involve a change to the Fuel Building electrical power?
9.	☐	☒	Involve a change to the Fuel Building ventilation?
10.	☐	☒	Involve a change to the ISFSI security?
11.	☐	☒	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	☒	Involve a change to spent fuel characteristics?
13.	☐	☒	Redefine/change heavy load pathways?
14.	☐	☒	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	☒	Involve a change to the loading bay or supporting components?
16.	☐	☒	New structures near the ISFSI?
17.	☐	☒	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	☒	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

III. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A.1, above.

A. Check the applicable boxes below. If any of the boxes are checked, clearly document the basis in Section II.B, below. If none of the boxes are appropriate, perform a 50.59 Evaluation in accordance with Section IV. Provide supporting documentation or references as appropriate.

☐ The proposed activity meets all of the following criteria regarding design function per Section 5.5[1](a):

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of evaluation that demonstrates intended design function(s) of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed activity already exists per Section 5.5[1](b). Reference 50.59 Evaluation # _____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

☐ The NRC has approved the proposed activity or portions thereof per Section 5.5[1](c). Reference: _____

B. **Basis**

Provide a clear, concise basis for determining the proposed activity may be exempted such that a third-party reviewer can reach the same conclusions. See Section 5.6.6 of the EOI 10 CFR 50.59 Review Program Guidelines for guidance.

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below. ☐ Yes ☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

None of the accidents or abnormality initiators found in the SAR are directly affected by the performance of this work. As noted in the review documentation, precautions will be taken to assure than any equipment failures which could result in the increased probability of an initiator during the proposed work have a minimal probability of occurrence.

Because there are no FSAR accident and abnormality initiators directly affected by this work, there is no more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

There are no SSC's that are being limited or directly affected by this work. Only the possibility of failure of the temporary equipment being installed and used for this package could affect SSC's. This equipment is designed and constructed to prevent damage to the SSC's. Construction during modes 1-4 for ANO-1 is limited to ensure the equipment cannot damage SSC's with most of the construction on the lifting devices not occuring until mode 5. As noted in the review documentation, precautions have been taken to assure than any equipment failures which could result in the increased probability during the proposed work have a minimal probability of occurrence of a failure of and SSC important to safety.

The construction equipment and foundations used to move the steam generators and reactor vessel heads in and out of the Reactor Building are designed to the AISC steel code and the ACI concrete code. They are designed for the lifted loads, wind loads, and seismic loads where applicable. All of the heavy lift equipment is load tested to assure capability to carry the loads for ANO. Configuration controls for equipment such as the OLS and OHTS, have limitations on the installed heights of the supporting towers for certain plant modes to keep from potentially falling onto the QCST tank (T-41B), BWST (T-3), the EDG and EFW exhaust stacks, the T-12 Tank Rooms, and the MSIV/MS Safety Valves during mode 1 through 4. (Note that impacts to the EDG in Modes 5 and 6 are addressed in the 10 CFR 50.65 evaluation.) The OLS has cables attached to the Reactor Building and to the south supporting tower to limit its fall path such that it cannot hit the RWT (2T-3), the EDG and EFW exhaust stacks, and the MSIV/MS Safety Valves. These requirements and design features assure the equipment such as the OLS, OHTS, RBOWP, and mast climber will not have any adverse effects upon Unit 1 and Unit 2 SSCs when they are required to perform their safety functions.

Therefore, implementation of ER-ANO-2002-1078-010 does not result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

There are no new dose sources or dose increases caused by this ER for accidents currently found in the FSAR. Accident mitigation SSC's remain intact and fully capable of performing their accident mitigation functions during FSAR evaluated accidents. Only the possibility of failure of the temporary equipment being installed and used for this package could affect SSCs.

Applicable accidents include the Main Steam Line Break (MSLB), the LOCA, the Steam Generator Tube Rupture (SGTR), and the Loss of Load which credit mitigating equipment in the area of the work for this ER. All events rely to some degree on the heat removal capability of the QCST for at least 30 minutes until Service Water is available. The LOCA consequences are mitigated by the BWST tank (T-3) and the Sodium Hydroxide Tank (T-10). The power and control cables to the diesel transfer pumps for Unit 1 are relied upon for the events which assume loss of Offsite Power such as the LOCA. These SSC's are protected either by current configuration, adding protective components over them, limiting lifting equipment over them, or limiting equipment erection height so that it cannot impact the SSC's when they are needed.

The possibilities of mobile crane failures impacting mitigating SSCs are assessed within a ~~10CFR50.65-A.4~~ 10CFR50.65(a)(4) evaluation. Implementation is administratively controlled through preventative measures such as operator training, scheduled maintenance of equipment, and limiting time that the cranes are in positions that failure could impact the ~~Sac's~~ SSCs. 5/5/05

Accordingly, there is no more than a minimal increase in the consequences of an accident previously evaluated in the FSAR.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR?
   ☐ Yes
   ☒ No

BASIS:

The malfunction of SSCs important to safety and the dose consequences of any accident they mitigate is unaffected because of equipment design, restricting equipment and adminstrative controls placed on the OLS, OHTS, RBOWP, mast climber, tendon access platforms, and the mobile cranes used to erect the structures. By limiting and controlling implementation activities to defined stages and defined plant conditions, plant accident mitigation equipment remains intact and capable of performing its accident mitigation functions during FSAR-evaluated accidents. 10 CFR 50.65(a)(4) evaluations are performed separately in ER-ANO-2002-1078-010 to address the risk of temporary installation/use of mobile cranes and tendon access work platforms. Therefore, there is no more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR?
   ☐ Yes
   ☒ No

BASIS:

By the design and implementation instructions of ER-ANO-2002-1078-010, the temporary installation and removal of the OLS, OHTS, RBOWP, mast climber, and tendon access platforms may be performed during the plant conditions without creating any adverse effect on important to safety SSCs. Although the OLS and the OHTS are robust in their structural design and reliabilities, it is possible that during rigging and handling of the OSGs (Original Steam Generator) and ORVCHs (Original Reactor Vessel Closure Head) an unlikely equipment failure could occur calusing a drop of the OSG/ORVCH. Calculation ANO-ER-04-007, "ANO-1 SG/RVCH Replacement - X/Q OTSG & RVCH Drop Analysis was performed to evaluate separately the radiological effects from a postulated drop of a OSG and ORVCH. For the worst case component drop during its rigging and handling outside the Unit 1 Reactor Building, the resultant radiation doses would be well within the regulatory requirements for offsite dose to the public at the Exclusion Area Boundary (EAB) and for dose to the control room operators. These dose values are only a fraction of the dose acceptance values for a Waste Gas Tank Rupture (Reference: Unit 1 UFSAR Section 14.2.2.7 and Unit 2 UFSAR Section 15.1.16) of 0.5 Rem total body exposure during a 2-hour period at the EAB.

Therefore, implementation of this ER does not create the possibility of an accident of a different type than previously evaluated in the FSAR.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The equipment and construction used in the ER-ANO-2002-1078-010 modification package is temporary and is controlled by implementation of equipment design, control of load paths, and erection sequences. No credible damage or malfunction will result to any plant SSCs to alter their failure modes during modes 1 through 4 for Unit 1 and Mode 1 for Unit 2.

For Unit 1 and Unit 2, potentially affected SSCs such as the Q-CST (T-41B), the BWST (T-3), and RWT (2T3) remain functual during Modes 1 through 4 by restricting load paths for moving equipment, restricting the erected heights of structures, adding protective components, or by added restraints to such temporary structures as the OLS to prevent impacting essential equipment.

Tendon work will be performed on Unit 1 while in Modes 1-4, and Mode 5 and below. Items accomplished during mode 1 include removing tendons caps and degreasing the tendons in preparation for detensioning, and removing one hoop and one vertical tendon prior to the outage. Buttresses 2 and 3 don't have important to safety SSCs located below the work area and uses large suspended work platforms to perform the work. Buttress 1 has EFIC lines, and the Penetration Room Ventilation exhaust duct flow sensing lines located below the work area. The Penetration Room Ventilation Exhaust duct flow sensing lines is exposed to tornado missile strikes which would not be a different result than the basket striking them. The tendon work platforms have two supension cables and bumpers on the platforms to ensure that the platforms will not fall even if one supporting line fails. The EFIC tubing is protected from damage by the bumpers on the platform and the insulation around the tubing.

Accordingly, implementation of ER-ANO-2002-1078-010 does not create the possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

The fission product barriers include the fuel pin cladding, the RCS system, and the Reactor Building pressure boundary. The ER-ANO-2002-1078-010 rigging and handling of the ROTSGs, OOTSGs, ORVCH, and RRVCH take place outside of the Unit 1 Reactor Building. The RCS sytem is not affected by this package however the fuel pin cladding could be challenged during a LOCA coincident with a loss of the BWST. This is addressed in the description of this review through limiting equipment heights and erection times to when the BWST and other SSC's safety functions are no longer needed.

The Reactor Building could be impacted in any of the modes but only modes 1 through 4 would have potential detrimental effects. The only potential challenge to the Reactor Building to meet its design requirements during implementation of this package would be from the attachments of construction equipment to the side of the building and from crane booms or towers falling into the building. The attachment of the equipment such as a mast climber and tendon rigging frames to the building has been analyzed and do not challenge the building integrity.

Because of the robust design of the reactor building, the impacting of the wall by cranes, towers, and other equipment could not challenge its integrity except for potential impacts to the tendon anchorages causing a tendon to become disabled. The maximum number of tendons susceptable to this type of damage would be limited to one or two in any event for the hoop tendons and no more that one for a vertical or dome tendon because of the separation of the tendons and the small impact footprint area. This is accepted because the building would still be able to meet its design requirement by resisting 59 psig pressure. Also, potential design basis threat have been evaluated and found to not challenge the Reactor Building integrity in any of its degraded conditions.

Therefore this package does not result in a design basis limit for fission product barrier described in the FSAR being exceeded or altered.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

The ER-ANO-2002-1078-010 involves the installation of the rigging and handling equipment for the removal and installation of ROTSGs, OOTSGs, ORVCH, and RRVCH. It also includes rigging and handlying of equipment to support the tendon work needed for the establishment and repair of the construction opening. The package used industry design practices to ensure the safe movement of the equipment and to ensure the protection of the SSCs that could be affected but did not require any evaluations to qualify the design of any SSCs discussed in the FSAR for this package.

Therefore there is no departure from a method of evaluation described in the FSAR used in establishin the design bases or in the safety analyses.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.

ATTACHMENT 9.2 ENVIRONMENTAL REVIEW FORM (TYPICAL)
SHEET 1 of 1

1. Facility: Arkansas Nuclear One
2. Document Number: ER-ANO-2002-1078-010
3. ER Number: ER-ANO-2002-1078-010
4. Activity Reviewed: Rigging and Handling outside Reactor Building ANO-1 SG/RCH Replacement Project
5. Complete Screening Below (as applicable to each site):

Reference	Within Scope	Modification/Revision/ Approval Needed
Section 2.0[1] References	☐ Yes ☐ No ☑ N/A	
Section 2.0[2] References	☐ Yes ☐ No ☑ N/A	
Section 2.0[4] References (ANO)	☑ Yes ☐ No ☐ N/A	☐ Yes ☑ No
Section 2.0[5] References (GGNS)	☐ Yes ☐ No ☑ N/A	☐ Yes ☐ No
Section 2.0[6] References (IP2)	☐ Yes ☐ No ☑ N/A	☐ Yes ☐ No
Section 2.0[7] References (IP3)	☐ Yes ☐ No ☑ N/A	☐ Yes ☐ No
Section 2.0[8] References (JAF)	☐ Yes ☐ No ☑ N/A	☐ Yes ☐ No
Section 2.0[9] References (PNPS)	☐ Yes ☐ No ☑ N/A	☐ Yes ☐ No
Section 2.0[10] References (RBS)	☐ Yes ☐ No ☑ N/A	☐ Yes ☐ No
Section 2.0[11] References (VYNPS)	☐ Yes ☐ No ☑ N/A	☐ Yes ☐ No
Section 2.0[12] References (W3)	☐ Yes ☐ No ☑ N/A	☐ Yes ☐ No

6. If within scope, attach cited reference(s) and appropriate section(s) along with a brief discussion: See Attached
7. If a modification, revision or approval is needed, attach a brief discussion: N/A
8. Prepared By: Dennis Calloway Date: 5-2-05

EN-EV-115 ENVIRONMENTAL REVIEW FORM CONTINUED

FACITLIY: ARKANSAS NUCLEAR ONE

DOCUMENT NUMBER: ER-ANO-2002-1078-010

ER NUMBER: ER-ANO-2002-1078-010

ACTIVITY REVIEWED: Rigging and Handling outside reactor building, ANO-1 SG/RVCH Replacement project

ITEMS REVIEWED;

a) **Instillation of fuel burning equipment**. The temporary use of mobile fuel burning equipment for maintenance activities and the associated use of non-gasoline storage tanks are exempt from the ANO Air Permit and exempt from the requirements of NMM-EV-117 "Air Management Program". A courtesy notification to the Arkansas Department of Environmental Quality, Air Division, has been made. See attached. No further actions are required.

b) **Involve the use or storage of oils or chemicals that could be directly released into the environment.** Best management practices are to be used in association with the use and storage of oil. Since the applications identified in this ER are mobile in nature, secondary containment for leaks and spills will be used were applicable. Otherwise best management practices are to be used. These will entail;

- Daily equipment checks for leaks and spills
- Contingency plans in the event leaks or spills are observed to include the staging of oil absorbing material near potential sources.
- The placement of storm drain covers (plastic sheeting and sand bags) near all area storm drains

Entergy

Arkansas Nuclear One
1448 SR 333
Russellville, AR 72802

March 10, 2005

Mr. Tom Rheaume
Permits Branch Manager
Arkansas Department of Environmental Quality
Air Permits Branch
P. O. Box 8913
Little Rock, AR 72219-8913

Subject: Arkansas Nuclear One
Air permit 90-AR-3
Temporary Mobile Emission Sources

ANO-2005-00025

Mr. Rheaume,

Arkansas Nuclear One (ANO) would like to inform the department of the temporary use of various mobile emission sources. Even though we may utilize temporary mobile sources at any time during normal operating conditions, 2005 will be an exceptionally busy year for ANO.

In March '05, Unit 2 will undergo a refueling outage. In October '05 Unit 1 will start a refueling outage and a steam generator replacement project. During outage periods various maintenance activities occur. Some of these maintenance activities require the use of temporary mobile emission sources. These may come in the form of compressor units, pumps, hydro-lazing units, or any number of other temporary mobile emission sources. None of these units are for the use of producing power for sale and are for the sole use of supporting maintenance activities.

ANO feels these emission sources are excluded under 40CFR89 and Regulation 18 Appendix "A" Group "B" Item 14 (maintenance activities), and therefore do not require listing under our current Air Permit.

Should you have questions or require additional information, please contact Dennis Calloway at (479) 858-5487.

Sincerely,

Teresa Madeley

Teresa Madeley,
Chemistry Superintendent

TM/JDC/jdc

cc: Rick Buckley M-ECH-595
J.D. Calloway
ANO-DCC

ADEQ
ARKANSAS
Department of Environmental Quality

April 1, 2005

Teresa Madeley
Chemistry Superintendent
Arkansas Nuclear One
Entergy Operations, Inc.
14448 S. R 333
Russelleville, AR 72802

RE: Various Temporary Mobile Sources
For Maintenance Purposes
AFIN: 58-00002, Permit No. 90-AR-3

Dear Ms. Madeley:

The installation/operation of various temporary mobile sources for various maintenance activities is hereby authorized. If you have any questions, please call me at 501.682.0737.

Sincerely,

Cecil Harrell
Compliance Engineer
Air Division

Copy: Kevin Nance
Records Management

58-0002.wpd

AIR DIVISION
8001 NATIONAL DRIVE / POST OFFICE BOX 8913 / LITTLE ROCK, ARKANSAS 72219-8913 / TELEPHONE 501-682-0739 / FAX 501-682-0753
www.adeq.state.ar.us

ANO 50.59 Evaluation Number

2005-024

I. OVERVIEW / SIGNATURES

Facility: ANO Unit 2

Document Reviewed: OP-2409.763, Physical Verification of Individual Fuel Pins Located Inside Fuel Assembly Guide Tubes **Change/Rev.:** 000-00-0

System Designator(s)/Description:

Description of Proposed Change:

During 2R2 fuel reconstitution activities, 2 failed fuel pins were severed while attempting to remove them from their fuel assemblies. Both pieces from one fuel rod were retrieved and placed into the SW guide tube of AKA006. The top piece of the second fuel pin was placed into the center guide tube of AKA006 (its lower half remaining in AKZ001). Encapsulation tubes were not used for these three fuel rod pieces.

On March 21, 2005, Entergy submitted letter CNRO-2005-0018, Response to NRC Bulletin 2005-01, Material Control and Accounting at Reactors and Wet Spent Fuel Storage Facilities, to the NRC. In this letter, the following commitment was made to the NRC, with a due date of 7/31/05: "At ANO, three individual fuel rods/segments have not yet been verified: one item at ANO-1, and two items at ANO-2. Verification of these items is planned via visual examination, mechanical verification, or radiological measurement."

This work plan will verify the Unit 2 severed spent fuel rods, as documented in the Reconstituted and Recaged Fuel Pin Inventory, CALC-01-R-0003-01, by inserting a stainless steel datum rod into the guide tubes of fuel assembly AKA006 until it contacts the expected fuel rod pieces located within the guide tube. Measurements will be made of the distance traveled from the top of the fuel assembly spider down to the contact point, and thereby verify the presence of material in the guide tube.

Inserting the datum rod into the guide tubes of AKA006 will not alter the spent fuel pool storage classification of AKA006. Conservatively assuming that the insertion of the datum rod into a guide is equivalent to a fuel rod, and utilizing the fuel classification equations listed in OP-1022.012, AKA006 will remain an "A" fuel assembly.

Check the applicable review(s): (Only the sections indicated must be included in the Review.)

☐	**EDITORIAL CHANGE of a Licensing Basis Document**	**Section I**
☐	**SCREENING**	**Sections I and II required**
☐	**50.59 EVALUATION EXEMPTION**	**Sections I, II, and III required**
☒	**50.59 EVALUATION (#: FFN-05-024)**	**Sections I, II, and IV required**

Preparer: Charles R. Garbe, Jr. / [signature] / ENS / Reactor Engr / June 9, 2005
Name (print) / Signature / Company / Department / Date

Reviewer: Todd A. Erskine / [signature] / ENS / Reactor Engr / June 13, 2005
Name (print) / Signature / Company / Department / Date

OSRC: John R. Eichenberger / [signature] 6-21-05
Chairman's Name (print) / Signature / Date
[Required only for Programmatic Exclusion Screenings and 50.59 Evaluations.]

II. SCREENINGS

A. Licensing Basis Document Review

1. **Does the proposed activity impact the facility or a procedure as described in any of the following Licensing Basis Documents?**

Operating License	YES	NO	CHANGE # and/or SECTIONS IMPACTED
Operating License	☐	☒	
TS	☐	☒	
NRC Orders	☐	☒	
If "YES", obtain NRC approval prior to implementing the change by initiating an LBD change in accordance with NMM ENS-LI-113. (See Section 5.2[13] for exceptions.)			

LBDs controlled under 50.59	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
FSAR	☐	☒	
TS Bases	☐	☒	
Technical Requirements Manual	☐	☒	
Core Operating Limits Report	☐	☒	
NRC Safety Evaluation Report and supplements for the initial FSAR[1]	☐	☒	
NRC Safety Evaluations for amendments to the Operating License[1]	☐	☒	
If "YES", perform an Exemption Review per Section III OR perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change. If obtaining NRC approval, document the LBD change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC. AND initiate an LBD change in accordance with NMM ENS-LI-113.			

LBDs controlled under other regulations	YES	NO	CHANGE # (if applicable) and/or SECTIONS IMPACTED
Quality Assurance Program Manual[2]	☐	☒	
Emergency Plan[2, 3]	☐	☒	
Fire Protection Program[3, 4] (includes the Fire Hazards Analysis)	☐	☒	
Offsite Dose Calculations Manual[3, 4]	☐	☒	
If "YES", evaluate any changes in accordance with the appropriate regulation AND initiate an LBD change in accordance with NMM ENS-LI-113. No further 50.59 review is required.			

[1] If "YES," see Section 5.2[5]. No LBD change is required.
[2] If "YES," notify the responsible department and ensure a 50.54 Evaluation is performed. Attach the 50.54 Review.
[3] Changes to the Emergency Plan, Fire Protection Program, and Offsite Dose Calculation Manual must be approved by the OSRC in accordance with NMM OM-119.
[4] If "YES," evaluate the change in accordance with the requirements of the facility's Operating License Condition or under 50.59, as appropriate.

2. **Does the proposed activity involve a test or experiment not described in the FSAR?** ☒ Yes ☐ No

   If "yes," perform a 50.59 Evaluation per Section IV OR obtain NRC approval prior to implementing the change AND initiate an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the change in Section II.A.5; no further 50.59 review is required. However, the change cannot be implemented until approved by the NRC.

3. Basis

   Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR and why the proposed activity does or does not involve a new test or experiment not previously described in the FSAR. Discuss other LBDs if impacted. Adequate basis must be provided within the Screening such that a third-party reviewer can reach the same conclusions. Simply stating that the change does not affect TS or the FSAR is not an acceptable basis.

During 2R2 fuel reconstitution activities, 2 failed fuel pins were severed while attempting to remove them from their fuel assemblies. Both pieces from one fuel rod were retrieved and placed into the SW guide tube of AKA006. The top piece of the second fuel pin was placed into the center guide tube of AKA006 (its lower half remaining in AKZ001). Encapsulation tubes were not used for these three fuel rod pieces. This work plan will verify the presence of the Unit 2 severed spent fuel rods, as documented in the Reconstituted and Recaged Fuel Pin Inventory, CALC-01-R-0003-01, by inserting a stainless steel datum rod into the guide tubes of fuel assembly AKA006 until it contacts the expected fuel rod pieces located within the guide tube. Measurements will be made of the distance traveled from the top of the fuel assembly spider down to the contact point, and thereby verify the presence of material in the guide tube. Inserting the datum rod into the guide tubes of AKA006 will not alter the spent fuel pool storage classification of AKA006. Conservatively assuming that the insertion of the datum rod into a guide is equivalent to a fuel rod, and utilizing the fuel classification equations listed in OP-1022.012, AKA006 will remain an "A" fuel assembly.

A licensing basis document search was conducted, both manually and electronically, as documented below. While fuel reconstitution is discussed in Section 4A of the Unit 2 SAR, and is also allowed per Section 5.2.1 of the Unit 2 Technical Specifications, the details of performing fuel reconstitution are beyond the level of detail contained in the licensing basis documents. The LBDs do not discuss the storage of failed fuel rods that are removed during reconstitution, nor do they discuss the inventory requirements on these failed fuel rods. Using a datum rod to confirm the presence of severed fuel rods in guide tubes is not discussed in the licensing basis documents and not considered within the scope of reconstitution activities. The SAR describes a postulated fuel handling accident in section 15.1.23. The discussion of the fuel handling accident is concerned with accidents involving movement of whole fuel assemblies. The details of the fuel handling accident discussion are not made inaccurate through performance of the proposed work plan. The fuel handling accident analysis and consequences bound any possible accident involving inserting a datum rod into a fuel assembly guide tube. Based on the above, the proposed work plan does not impact the facility or a procedure as described in the licensing basis documents.

The individual fuel pin inventory to be performed under work plan OP-2409.763 is considered a test or experiment not described in the FSAR. Therefore, a 50.59 evaluation will be performed.

4. <u>References</u>

Discuss the methodology for performing LBD searches. State the location of relevant licensing document information and explain the scope of the review such as electronic search criteria used (e.g., key words) or the general extent of manual searches per Section 5.5.1[5](d) of LI-101. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

LBDs/Documents reviewed via keyword search:	Keywords:
50.59 – Unit 2	encapsulation; fuel pin; fuel rod; reconstitution; failed fuel; fuel w/20 broken; fuel w/20 severed; fuel w/20 piec*

LBDs/Documents reviewed manually:

Unit 2 Technical Specification 3/4.9; 3/4.7.6; 5

Unit 2 Technical Specification Bases 3/4.9; 3/4.7.6

Unit 2 COLR

Unit 2 SAR 1.2.2.6; 4A; 9.1.2 - 9.1.4; 12.4.1.1; 15.1.23

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5. **Is the validity of this Review dependent on any other change?**

☐ **Yes**
☒ **No**

If "YES", list the required changes/submittals. The changes covered by this 50.59 Review cannot be implemented without approval of the other identified changes (e.g., license amendment request). Establish an appropriate notification mechanism to ensure this action is completed.

B. ENVIRONMENTAL SCREENING

If any of the following questions is answered "yes," an Environmental Review must be performed in accordance with NMM Procedure ENS-EV-115, "Environmental Evaluations," and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Involve a land disturbance of previously disturbed land areas in excess of one acre (i.e., grading activities, construction of buildings, excavations, reforestation, creation or removal of ponds)?
2.	☐	☒	Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)?
3.	☐	☒	Involve dredging activities in a lake, river, pond, or stream?
4.	☐	☒	Increase the amount of thermal heat being discharged to the river or lake?
5.	☐	☒	Increase the concentration or quantity of chemicals being discharged to the river, lake, or air?
6.	☐	☒	Discharge any chemicals new or different from that previously discharged?
7.	☐	☒	Change the design or operation of the intake or discharge structures?
8.	☐	☒	Modify the design or operation of the cooling tower that will change water or air flow characteristics?
9.	☐	☒	Modify the design or operation of the plant that will change the path of an existing water discharge or that will result in a new water discharge?
10.	☐	☒	Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
11.	☐	☒	Involve the installation of stationary fuel burning equipment or use of portable fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)?[1]
12.	☐	☒	Involve the installation or use of equipment that will result in a new or additional air emission discharge?
13.	☐	☒	Involve the installation or modification of a stationary or mobile tank?
14.	☐	☒	Involve the use or storage of oils or chemicals that could be directly released into the environment?
15.	☐	☒	Involve burial or placement of any solid wastes in the site area that may affect runoff, surface water, or groundwater?

[1] See NMM Procedure ENS-EV-117, "Air Emissions Management Program," for guidance in answering this question.

C. SECURITY PLAN SCREENING

If any of the following questions is answered "yes," a Security Plan Review must be performed by the Security Department to determine actual impact to the Plan and the need for a change to the Plan.

Could the proposed activity being evaluated:

	Yes	No	
1.	☐	☒	Add, delete, modify, or otherwise affect Security department responsibilities (e.g., including fire brigade, fire watch, and confined space rescue operations)?
2.	☐	☒	Result in a breach to any security barrier(s) (e.g., HVAC ductwork, fences, doors, walls, ceilings, floors, penetrations, and ballistic barriers)?
3.	☐	☒	Cause materials or equipment to be placed or installed within the Security Isolation Zone?
4.	☐	☒	Affect (block, move, or alter) security lighting by adding or deleting lights, structures, buildings, or temporary facilities?
5.	☐	☒	Modify or otherwise affect the intrusion detection systems (e.g., E-fields, microwave, fiber optics)?
6.	☐	☒	Modify or otherwise affect the operation or field of view of the security cameras?
7.	☐	☒	Modify or otherwise affect (block, move, or alter) installed access control equipment, intrusion detection equipment, or other security equipment?
8.	☐	☒	Modify or otherwise affect primary or secondary power supplies to access control equipment, intrusion detection equipment, other security equipment, or to the Central Alarm Station or the Secondary Alarm Station?
9.	☐	☒	Modify or otherwise affect the facility's security-related signage or land vehicle barriers, including access roadways?
10.	☐	☒	Modify or otherwise affect the facility's telephone or security radio systems?

Documentation for accepting any "yes" statement for these reviews will be attached to this 50.59 Review or referenced below.

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

(NOTE: This section is not applicable to Waterford 3 and may be removed from 50.59 Reviews performed for Waterford 3 proposed activities.)

If any of the following questions is answered "yes," an ISFSI Review must be performed in accordance with NMM Procedure ENS-LI-112, "72.48 Review," and attached to this Review.

Will the proposed Change being evaluated:

	Yes	No	
1.	☐	☒	Any activity that directly impacts spent fuel cask storage or loading operations?
2.	☐	☒	Involve the Independent Spent Fuel Storage Installation (ISFSI) including the concrete pad, security fence, and lighting?
3.	☐	☒	Involve a change to the on-site transport equipment or path from the Fuel Building to the ISFSI?
4.	☐	☒	Involve a change to the design or operation of the Fuel Building fuel bridge including setpoints and limit switches?
5.	☐	☒	Involve a change to the Fuel Building or Control Room(s) radiation monitoring?
6.	☐	☒	Involve a change to the Fuel Building pools including pool levels, cask pool gates, cooling water sources, and water chemistry?
7.	☐	☒	Involve a change to the Fuel Building handling equipment (e.g., bridges and cask cranes, structures, load paths, lighting, auxiliary services, etc)?
8.	☐	☒	Involve a change to the Fuel Building electrical power?
9.	☐	☒	Involve a change to the Fuel Building ventilation?
10.	☐	☒	Involve a change to the ISFSI security?
11.	☐	☒	Involve a change to off-site radiological release projections from non-ISFSI sources?
12.	☐	☒	Involve a change to spent fuel characteristics?
13.	☐	☒	Redefine/change heavy load pathways?
14.	☐	☒	Fire and explosion protection near or in the on-site transport paths or near the ISFSI?
15.	☐	☒	Involve a change to the loading bay or supporting components?
16.	☐	☒	New structures near the ISFSI?
17.	☐	☒	Modifications to any plant systems that support dry fuel storage activities?
18.	☐	☒	Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building?

III. 50.59 EVALUATION EXEMPTION

Enter this section only if a "yes" box was checked in Section II.A.1.

A. Check the applicable boxes below. If any of the boxes are checked, clearly document the basis in Section III.B, below. If none of the boxes are appropriate, perform a 50.59 Evaluation in accordance with Section IV. Provide supporting documentation or references as appropriate.

☐ The proposed activity meets all of the following criteria regarding design function per Section 5.5[1](a):

The proposed activity does not adversely affect the design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of performing or controlling a design function of an SSC as described in the FSAR; **AND**

The proposed activity does not adversely affect a method of evaluation that demonstrates intended design function(s) of an SSC described in the FSAR will be accomplished.

☐ An approved, valid 50.59 Review(s) covering associated aspects of the proposed activity already exists per Section 5.5[1](b). Reference 50.59 Evaluation # _____ (if applicable) or attach documentation. Verify the previous 50.59 Review remains valid.

☐ The NRC has approved the proposed activity or portions thereof per Section 5.5[1](c). Reference: _____

B. Basis

Provide a clear, concise basis for determining the proposed activity may be exempted such that a third-party reviewer can reach the same conclusions.

IV. 50.59 EVALUATION

License Amendment Determination

Does the proposed Change being evaluated represent a change to a method of evaluation ONLY? If "Yes," Questions 1 – 7 are not applicable; answer only Question 8. If "No," answer all questions below.

☐ Yes
☒ No

Does the proposed Change:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

The proposed test, inserting a datum rod into the guide tubes of AKA006 to verify the presence of severed fuel pins, does not result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR. As discussed earlier, the criticality analysis is not impacted by the insertion of the datum rod. Conservatively assuming that the datum rod is equivalent to a fuel pin, and adding an enrichment penalty factor to AKA006 (as described in OP-1022.012, Storage, Control and Accountability of Special Nuclear Material), will not change the criticality storage classification (A) of fuel assembly AKA006. Section 15.1.23 of the FSAR describes the Fuel Handling Accident, which consists of a fuel assembly drop which ruptures 60 fuel rods. The insertion of a datum rod into the guide tubes of fuel assembly AKA006 is not an initiator of any accident. The fuel rods contained in the guide tubes are already severed. As this work plan does not involve the lifting or movement of any fuel assemblies, and since the criticality analysis is not impacted, there is no increase in the frequency of occurrence of an accident previously evaluated in the FSAR.

2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

The insertion of a datum rod into the guide tubes of fuel assembly AKA006 does not affect the performance of any structure, system or component. There are no changes to FHAV, SFP, SFP cooling or fuel handling equipment. Conservatively assuming that the datum rod is equivalent to a fuel pin, and adding an enrichment penalty factor to AKA006 (as described in OP-1022.012, Storage, Control and Accountability of Special Nuclear Material), will not change the criticality storage classification (A) of fuel assembly AKA006. The performance of the proposed work plan can not initiate the failure of any plant structure system or component and therefore, the proposed work plan does not result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR.

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR?

☐ Yes
☒ No

BASIS:

The criticality analysis is not impacted by the insertion of the datum rod into the guide tubes of fuel assembly AKA006. Conservatively assuming that the datum rod is equivalent to a fuel pin, and adding an enrichment penalty factor to AKA006 (as described in OP-1022.012, Storage, Control and Accountability of Special Nuclear Material), will not change the criticality storage classification (A) of fuel assembly AKA006. Section 15.1.23 of the FSAR describes the Fuel Handling Accident, which consists of a fuel assembly drop which ruptures 60 fuel rods. As the datum rod will at most come into contact with one fuel rod (which is already severed), the performance of the work plan is bounded by the fuel handling accident, and will not result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR.

4. Result in more than a minimal increase in the consequences of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The insertion of a datum rod into the guide tubes of fuel assembly AKA006 does not affect the performance of any structure, system or component. There is no greater reliance on any system, structures, or components to perform their safety functions during the performance of this workplan than exists during other spent fuel pool activities. Therefore, the proposed work plan does not result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the FSAR.

5. Create a possibility for an accident of a different type than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The insertion of a datum rod into the guide tubes of fuel assembly AKA006 is not an initiator of any accident. The fuel rods contained in the guide tubes are already severed. Damage to fuel pins is the only type of accident possible and is already considered in the SAR. Conservatively assuming that the datum rod is equivalent to a fuel pin, and adding an enrichment penalty factor to AKA006 (as described in OP-1022.012, Storage, Control and Accountability of Special Nuclear Material), will not change the criticality storage classification (A) of fuel assembly AKA006. Therefore, the proposed work plan does not create a possibility for an accident of a different type than any previously evaluated in the FSAR.

6. Create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR? ☐ Yes ☒ No

BASIS:

The insertion of a datum rod into the guide tubes of fuel assembly AKA006 does not affect the performance of any structure, system or component. The workplan is neither obtrusive to nor modifies any system structure or components important to safety. The insertion of a datum rod will not cause the failure of any fuel pins with a different result than previously analyzed in SAR Section 15.1.23. The performance of the proposed work plan can not initiate the failure of any plant structure, system or component and therefore, the proposed work plan does not create a possibility for a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the FSAR.

7. Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered? ☐ Yes ☒ No

BASIS:

The insertion of a datum rod into the guide tubes of fuel assembly AKA006 in the spent fuel pool will in no way impact fuel temperatures or any other design basis limit for a fission product barrier as described in the FSAR. The fuel rods contained in the guide tubes are already severed, thus this fission product barrier is already breached.

8. Result in a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses? ☐ Yes ☒ No

BASIS:

The proposed work plan merely inserts a datum rod into the guide tubes of fuel assembly AKA006 in the spent fuel pool, and does not impact any method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses.

If any of the above questions is checked "YES", obtain NRC approval prior to implementing the change by initiating a change to the Operating License in accordance with NMM Procedure ENS-LI-113.