I. OVERVIEW / SIGNATURES

Facility: Waterford 3

Document Reviewed: *ER-W3-2005-0083-000* **Change/Rev.:** *0*

System Designator(s)/Description: Radiation Monitoring

Description of Proposed Change:

The impact of the Waterford 3 EPU project was addressed via ER-W3-2001-1149-000. The Alternate Source Term (AST) project was recently approvied by the NRC via TS Amendment 198. AST impacted the accident source terms in FSAR Chapter 15. As a result of these projects a number of Health Physics calculations (HPCALCs) required revision. ER-W3-2005-0083-000 determined the impact of these calculations to the plant design and licensing basis. The HPCALCs included in ER-W3-2005-0083-000 fell into one of three categories:

- ***Setpoint Calculations:*** *Calculations HPCALC05-007, -009, -010, and -011 were generated to determine appropriate setpoints for a number of different radiation monitors. Calculations HPCALC05-007, -009, and -010 were addressed via the 50.59 for ER-W3-2001-1149-000, therefore they are not addressed by either this evaluation or ER-W3-2005-0083-000. HPCALC05-011 determines new setpoints for the containment particulate, iodine, and noble gas (PIG) radiation monitor. The values for these setpoints are contained if FSAR Table 12.3-3.*
- ***Emergency Plan:*** *Calculations HPCALC05-001, -002, -003, -004, and -008 were generated to update information in a number of E-plan procedures.*
- ***FSAR (C/DAC) Updates:*** *HPCALC05-005 was prepared to update the ratio of the average airborne concentration to the Derived Air Concentration (C/DAC) values contained in FSAR Table 12.2-15a based on EPU source terms. Similarly, HPCALC05-006 was prepared to update the room by room C/DAC information found in FSAR Table 12.2-16a based on EPU source terms.*

The proposed change therefore (1) updates the E-plan procedures in accordance with the new calculations (screening), (2) updates FSAR Tables 12.2-15a and 12.2-16a (evaluation), and (3) revises the containment PIG particulate and iodine setpoints presented in FSAR Table 12.3-3 (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**
☒	**50.59 EVALUATION (#: 05-011)**	**Sections I, II, and IV required**

Preparer: Christopher G. Pratt / [signature] / Emerald Coast Services / DE - EPU / 04-03-2005
Name (print) / Signature / Company / Department / Date

Reviewer: Samir Ramzy/ [signature] / EOI / Health Physics / 04-03-2005
Name (print) / Signature / Company / Department / Date

OSRC: Richard J. Madjerich / [signature] 4-11-05
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	☒	☐	FSAR Chapter 12 to be updated via DRN05-455.
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.

The setpoints for the containment PIG were removed from the Technical Specifications via Amendment 197, therefore the TS are not affected. TS 3.4.5.1 requires at least one containment atmosphere particulate radioactivity monitor to be operable. TS 3.4.5.2 requires that RCS leakage be limited to 1.0 gpm unidentified leakage. The calculated setpoint for the containment particulate channel will ensure that the 1 gpm leak limit of TS 3.4.5.2 will be detected within 1 hour, as required by Regulatory Guide 1.45. The source terms used in these calculations are consistent with the proposed EPU TS, therefore the downstream calculations are inherently consistent as well. Any additional assumptions in the calculations do not conflict with any TS. Similarly, the TS bases are not impacted by this change. The Technical Requirements Manual does not include any requirements for the containment PIG.

The operating license was reviewed with respect to the Emergency Plan, Radiation Monitors, Setpoints, and Derived Air Concentrations (DAC). This review concluded that the changes associated with this evaluation are below the level of detail for information contained in the Operating License.

Several of the HPCALCs affect E-plan procedures. These calculations utilized source terms being implemented via the EPU and AST projects. Those source terms were evaluated via the 50.59 reviews for those projects, and therefore are not included in ER-W3-2005-0083-000. The E-plan procedures impacted simply implement the plan and are below the level of detail of the E-plan itself. Similarly, while the FSAR contains information on the E-plan, the revised HPCALCs remain below the level of detail in the FSAR, thus it is not impacted from these calculations.

Conservatively lowering the setpoint does not constitute a test or experiment as this change is within the design of the instrument (as described in the SAR). Similarly, the revision to the C/DAC values is based on use of the current methodology with the updatetd EPU source term, therefore that change is not the result of any 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 5.5.1[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:
FSAR, Technical Specifications, Operating License, Emergency Plan, 50.59 (search), ODCM, Original SER (NUREG-0737)	"radiation monitor", PIG, EAL, "emergency action level", "air concentration", DAC, "RCS leakage", "containment" AND "leakage", "reactor coolant system leakage"

LBDs/Documents reviewed manually:

- Technical Specification Amendment 197
- FSAR Section 12.3.4.2.3.1
- Technical Specification Amendment 198
- Technical Specification 3/4.4.5.1
- Technical Specification 3/4.4.5.2
- Regulatory Guide 1.45
- Regulatory Guide 1.97

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.

The source term used in the HPCALCs was based on other calculations prepared to support the Waterford 3 Extended Power Uprate and Alternative Source Term projects. Both projects were submitted to the NRC for their review and approval. AST was approved by the NRC via Amendment 198. EPU has yet to be approved; therefore approval of EPU is required for this Evaluation to be valid.

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.

Not Required per Section II.

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:

These changes are analytical in nature. Specifically, the updated calculations which impact the SAR are based on the same methodology. The only change is the updated source terms which were submitted to the NRC via the EPU project. The proposed change will revise the containment PIG setpoints for the particulate and iodine channels as presented in FSAR Table 12.3-3. Also, the ratio average airborne concentration to the Derived Air Concentration (C/DAC) data in FSAR Tables 12.2-15a and 12.2-16a are updated based on the EPU source term.

These changes have no impact on any system or its performance. The source term is based on normal operation, and the information contained in these FSAR Tables is not related to any accidents postulated in the SAR. As such no accident initiators are impacted, thus there is no change in the frequency of occurrence of any accident 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 changes will have no impact on plant SSCs. Generally speaking the overall source term decreased from the previous values. While 10 of the 43 isotopes increased (Kr-85, Xe-131m, Xe-135, Xe-137, Xe-138, I-134, Cr-51, Mn-54, Np-239, and Te-129), the overall activity of the table decreased, therefore the overall impact is conservative. For example, the containment concentration of I-135 increased from 8.67E-11 uCi/cc to 1.82E-10uCi/cc (roughly a factor of 2 increase), the concentration of I-131, which is radiologically more significant, decreased from 1.59E-07 uCi/cc to 1.31E-09 (factor of 100 reduction). Therefore it is clear that the decrease in I-131 more than off-sets the increase in I-134. As such the net change is clearly conservative. The revised setpoints in the FSAR for the containment PIG are more conservative than the previous values. Operation of the containment PIG will not be impacted by these lower setpoints. Therefore, this change 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 data contained in FSAR Tables 12.2-15a and 12.2-16a is representative of normal operation and is not related to any accident currently contained in the FSAR. The results demonstrate that plant Derived Air Concentration (DAC) values are a small fraction of 10CFR20 limits, therefore the revised values will not prohibit access to any area as a result of this change under normal operation or accident conditions. The airborne source terms from normal operation are not significant for evaluated accidents, and therefore they are neglected in the dose consequence analyses. In any case, only a few isotopes increased, therefore the overall source term is conservative and therefore any associated dose consequences would be bounded by the current values. The containment PIG monitors the containment atmosphere, thus it detects leakage from the reactor coolant system which can be used to initiate corrective action and prevent a leak from becoming a LOCA. The revised setpoints preserve this function. However, the dose analyses contained in FSAR Chapter 15 do not credit this function, therefore any change to the setpoint will not impact the dose consequences presented in FSAR Chapter 15.These changes have no impact to any equipment which is required to mitigate the consequences of an accident. Thus, this change 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:

While the concentration of several isotopes increased, the overall impact was conservative. Also, this change has no impact to any accident or its associated dose consequences. There will be no direct or indirect impact to plant SSCs. The containment PIG setpoint is contained in the RMS database. Conservatively lowering the setpoint (as presented in FSAR Table 12.3-3) will not impact the operation of the containment PIG itself. Therefore, this change 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:

This change only revises several FSAR tables based on the new Power Uprate source term, and as such the change will not impact any potential initiators to any events. While the values for several isotopes increased, the overall airborne source term is decreasing as a result of this change. The proposed change to FSAR Tables 12.2-15a and 12.2-16a can not potentially cause an event different from what is currently in the SAR. Similarly, the containment PIG is not credited in any accident, nor can it potentially be the initiator for a new accident. As such this change does 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 air concentration of only a small number of isotopes increased, therefore the overall source term is bounding and the net change is conservative in nature. The updates to FSAR Tables 12.2-15a and 12.2-16a are administrative and do not impact any plant equipment. The revised setpoint for particulate channel to the containment PIG ensures that the radiation monitor can continue to detect a 1 gpm leak from the reactor coolant system within 1 hour as require by Regulatory Guide 1.45 and plant Technical Specifications (The iodine channel is not required to meet either RG 1.45 or TS requirements). Thus, this change does not create the possibility of a malfunction of an SSC 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 design basis source term used to determine the updates to FSAR Tables 12.2-15a and 12.2-16a was developed in accordance with ANS 18.1-1999 assumptions, and this source term was submitted to the NRC via the Extended Power Uprate project. The radioactivity represents the normal operation source term and does not assume the failure of a fission product barrier. As such the corresponding concentrations and C/DAC values (ratio of air Concentration to Derived Air Concentration) are not related to any fission product barrier. The containment PIG monitors sample the containment atmosphere for radioisotopes. The setpoint was determined to ensure that the particulate channel would detect a 1 gpm leak from the reactor coolant system, as required per TS 3.4.5.2 and Regulatory Guide 1.45. Therefore, this change does not result in any design basis limit for fission product barriers 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 source term used in the updates was developed in accordance with ANSI 18.1-1999 guidelines, and this source term was submitted to the NRC for their review and approval. The overall methodology used to

determine these values is identical to that used in the previous analyses to support FSAR Tables 12.2-15a and 12.2-16a. The particulate setpoint of the containment PIG is required to detect a 1 gpm leak for the RCS within 1 hour in order to meet the requirements of plant Technical Specifications and Regulatory Guide 1.45 (The iodine channel is not required to meet either TS or RG 1.45). The new setpoints used the same methodology as that used in the previous analysis, however the calculation used the EPU source term based on ANS 18.1-1999 (which was submitted to the NRC via EPU). Therefore, this change does not result in a departure from a method of evaluation described in the FSAR used in establishing the design basis 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.