

I. OVERVIEW / SIGNATURES

Facility: Waterford 3

Document Reviewed: ER-W3-2004-0276-000, AST Implementation Change/Rev.: 0

System Designator(s)/Description: None

Description of Proposed Change

Waterford 3 recently submitted revised dose consequence analyses to the NRC. These analyses utilized the Alternative Source Term (AST) dose methodology and were performed in accordance with Regulatory Guide 1.183 guidance. Also, Waterford 3 submitted an Extended Power Uprate (EPU) submittal to the NRC which would allow the plant to operate at 3,716 MWt. EPU is being implemented by ER-W3-2001-1149-000. The -1149-000 ER has a series of "inter-discipline" ERs which address the impact to the various FSAR Chapters (ER-W3-2001-1149-001 through -015). ER-W3-2001-1149-014 originally was to address the impact of EPU to the radiological consequence portions of FSAR Chapter 15, however since AST also had a significant impact on FSAR Chapter 15 the two projects were combined (with respect to FSAR Chapter 15) for efficiency. Finally, several issues with the current design basis were uncovered during review of the radiological design basis for both the AST and EPU projects. This ER also resolves a number of these issues, as well as incorporates AST and EPU (radiological dose consequences portions) into the plant design and licensing basis.

Power Uprate

ER-W3-2004-0276-000 addresses the impact of the EPU project has on the radiological portions of FSAR Chapter 15 (The impact to the non-radiological portions is addressed in ER-W3-2001-1149-015, and the overall impact of EPU is addressed in the "Nuclear Change" ER-W3-2001-1149-000). As discussed previously, the impact the EPU project has on the plant is being addressed via a series of "inter-discipline ERs" (ER-W3-2001-1149-000 through -015). This ER incorporates the scope of ER-W3-2001-1149-014 (which was the original document to evaluate the impact to the dose consequence sections of FSAR Chapter 15).

The Power Uprate Report (PUR) [Reference EPU1] documents the dose analyses performed in support of the EPU project. The PUR documents whether an analysis was (1) evaluated, (2) not required to be addressed for EPU, or (3) bounded by another analysis.

(CONTINUED NEXT PAGE)

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

<input type="checkbox"/>	EDITORIAL CHANGE of a Licensing Basis Document	Section I
<input type="checkbox"/>	SCREENING	Sections I and II required
<input type="checkbox"/>	50.59 EVALUATION EXEMPTION	Sections I, II, and III required
<input checked="" type="checkbox"/>	50.59 EVALUATION (#: <u>05-004</u>)	Sections I, II, and IV required

Preparer:

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Reviewer:

Joseph Reese for William Steelman per telecon / EOI / OPS / 2-3-05

OSRC:

B.A. Dodds III / B. A. Dodds III / 4 Feb 2005

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

Alternative Source Term

The NRC issued Generic Letter (GL) 2003-01, "Control Room Habitability," documents NRC concerns with potential deficiencies in control room design. Several plants had performed leakage testing and determined that the actual inleakage into the control room envelope exceeded the assumptions of the design basis analyses. Waterford 3 performed Tracer Gas Testing of the control room envelope as documented in ER-W3-2004-0546-000. The test results confirmed that the inleakage exceeded the values assumed in the Waterford 3 dose consequence analyses for the main control room. Also, the GL required that control room doses be considered for each accident scenario, however under the current licensing basis Waterford 3 only evaluated control room doses for the Large Break Loss of Coolant Accident (LB LOCA) and the Fuel Handling Accident (FHA). The only viable method to address these issues was the new AST dose methodology allowed by the NRC.

AST was developed by cooperation of both industry and regulatory personnel due to research following the Three Mile Island (TMI) accident. Research indicated that use of the current design basis accident (DBA) dose assumptions (based on TID-14844) yielded more conservative results than many severe accidents (SA), even though the SA equipment failure assumptions exceeded those dictated for a typical DBA. As such, the NRC issued 10CFR50.67, "Alternative Source Terms," and Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors."

Waterford 3 evaluated the required dose analyses to implement the AST and submitted the analyses to the NRC [AST1 & AST2]. The analyses submitted are

- Large Break Loss of Coolant Accident (LB LOCA) [AST1, AST3, & AST5];
- Small Break Loss of Coolant Accident (SB LOCA) [AST1];
- Control Element Assembly (CEA) Ejection [AST1];
- Steam Generator Tube Rupture (SGTR) [AST1 & AST5];
- Fuel Handling Accident (FHA) [AST1];
- Inside Containment Main Steam Line Break (IC MSLB) [AST1];
- Outside Containment Main Steam Line Break/Feedwater Line Break (OC MSLB) [AST1];
- Reactor Coolant Pump (RCP) Seized Rotor/Sheared Shaft [AST2];
- Inadvertent Opening of a Steam Generator Atmospheric Dump Valve (IOSGADV) [AST2];
- Excess Main Steam Line (MSL) Flow with Loss of Offsite Power [AST2]; and
- Letdown Line Break [AST2].

Each analysis was developed in accordance with Regulatory Guide 1.183 guidance.

The control room model was revised slightly to address the NRC concerns with respect to control room habitability. Specifically, a control room unfiltered inleakage term was added to address the GL2003-01 concerns discussed previously. To meet GDC19 and 10CFR50.67 limits, Waterford 3 credited the fact that the plant has dual air intakes for the main control room. In order to credit these intakes, Regulatory Guide 1.183 and SRP Section 6.4 require safety related radiation monitors which are redundant for each air intake. Due to the fact that a manual operator action is required due to the monitors (using AST assumptions), the monitors are being reclassified as "Type A" instruments in accordance with Regulatory Guide 1.97 requirements.

Plant Design (and Licensing) Basis Issues

A number of design basis issues were discovered in the radiological design basis during review of plant documentation in support of both the AST and EPU projects (as documented in various plant condition reports). ER-W3-2004-0276-000 addresses the impact of several of these design basis issues. Of these issues only control room unfiltered inleakage (habitability) was submitted to the NRC. As such each of these must be addressed under 10CFR50.59.

- Calculations 3C3-30 and 3C3-32 support the current design and licensing basis for the TMI Action Plan (NUREG-0737) and Equipment Qualification (NUREG-0588), respectively. During review of these calculations for the impact of EPU, it was discovered that the calculations did not account for the Controlled Ventilation Area System (CVAS) filter trains as a source of post accident doses for either control room doses or plant EQ analyses. This issue is documented in CR-W3-2004-2461. Calculation ECS04-018 was generated to determine the impact to plant dose rates (other than the control room) due to this condition. Upon further research it was discovered this condition had a potential negative impact on plant EQ as the doses for a number of EQ Zones increased (Zones M, N, and O). As such CR-W3-2004-2690 was issued. Finally, when revising calculation 3C3-32 (to incorporate the results of ECS04-018) it was further discovered that the water chillers currently located on the +46' elevation of the RAB are considered a mild environment, due primarily to the installation of shielding on the SBVS filter train. However, the results of ECS04-018 indicate that the dose from the CVAS filter train is ~2E4

Rads, which exceeds the "mild" environment threshold of $1.0E4$ Rads. Therefore, the environment is not "mild" thus additional EQ criteria apply. The plant has installed additional temporary shielding to restore the accident doses to below $1.0E4$ (TSR2004-047) as covered under the OPERABILITY assessment for CR-W3-2004-3560. Due to the impact of installing permanent shielding, final resolution with respect to all EQ issues will be addressed in "linked" ER-W3-2004-0276-001. The remaining items due to these CRs are included within the scope of this ER (and this 10CFR50.59 Evaluation).

- CR-W3-2003-2893 documents the fact that the equation used in calculation 3C3-30 to determine the daughter products for Kr-88, Kr-89, and Xe-138 had a minor error. This error was addressed in the revision to the calculation, and there are no additional impacts to the plant design basis.
- CR-W3-2003-2561 documents the fact that this calculation applied an incorrect, non-conservative scaling factor in determining the post-LOCA 1 year gamma TID for containment zone CC. This issue was addressed in the revision to calculation 3C3-30. A more accurate method was used to demonstrate that the current results are bounding, therefore there was minimal impact to the plant design basis.

Also, during review of plant calculations, a number of older calculations were identified which did not appear to support the current plant design or licensing basis. Generally speaking, the RAC calculation series was prepared between 1976 and 1981, and most of the calculations have a revision status of "0." Many of these calculations were preliminary evaluations for dose calculations, and were eliminated based on either more recent calculations currently approved or were superseded based on EPU and AST. Other calculations not directly related to one of the EPU or AST analyses were reviewed on a case by case basis. Those which were clearly obsolete were VOIDED in accordance with the calculation procedure (DC-126). The status of any calculation which was not obsolete or could provide useful historical information in the future was changed to a STUDY calculation to ensure users' would not apply the calculation to design basis applications.

FSAR Sections 15.7.3.1, "Radioactive Waste Gas System Leak or Failure," and 15.7.3.2, "Liquid Waste System Leak or Failure (Release to Atmosphere)," evaluates the dose consequences due to postulated events. The Waterford 3 PUR explained that these events were not being updated for EPU since (1) it has been removed from the SRP, and (2) it is not required to be addressed per Section 2.7 of draft Review Standard RS-001, "Review Standard for Extended Power Uprates The events currently in the SAR were not updated for EPU conditions as documented in the PUR, therefore they would not necessarily represent EPU conditions. Since the events are no longer required per the SRP or the extended power uprate review standard, the NRC does not require them to be evaluated to ensure the health and safety of the public. NRC has effectively approved removal of these events from the FSAR.

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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
TS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	All Technical Specification changes for EPU are being addressed under ER-W3-2001-1149-000. No TS relaxations were requested for AST.
NRC Orders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DRN 04-1619: FSAR Chapter 1; DRN05-149: FSAR Chapter 2; DRN05-150: FSAR Chapter 5; DRN 04-0705: FSAR Chapter 6; DRN 04-1967: FSAR Chapter 7; DRN 04-1977: FSAR Chapter 9; DRN 03-2066: FSAR Chapter 12 (Included in ER-W3-2001-1149-011); DRN 04-0704: FSAR Chapter 15
TS Bases	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DRN05-132: TS 3/4.4.5.2 (Included in ER-W3-2001-1149-000), TS 3/4.4.7, TS 3/4.6.1, TS 3/4.6.2, TS 3/4.6.6, TS3/4.7.1, and 3/4.9.9
Technical Requirements Manual	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TRM 3.6.1 Bases
Core Operating Limits Report	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
NRC Safety Evaluation Report and supplements for the initial FSAR ¹	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
NRC Safety Evaluations for amendments to the Operating License ¹	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Emergency Plan ^{2,3}	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Fire Protection Program ^{3,4} (includes the Fire Hazards Analysis)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Offsite Dose Calculations Manual ^{3,4}	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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.

ER-W3-2004-0276 does not include any physical modifications to plant equipment, although control room (and simulator) labels are being updated to reflect the control room air intake radiation monitors as Regulatory Guide 1.97, Type A instruments. The activities are analytical in nature and are not related (directly or indirectly) to any test or experiment. There are extensive changes to the FSAR from both AST and EPU. Most of the changes are directly supported by information submitted to the NRC. As such the bulk of these changes meet the 50.59 "exemption" criteria and are addressed by the "screening" portion of this 50.59 review (a detailed list is included in Question 5 below).

There are also several changes due to several condition reports which have been issued concerning the Controlled Ventilation Area System (CVAS). Specifically, the CVAS filters were not included in a number of radiological calculations during the initial design of the plant, even though the CVAS has a significant source term following a postulated LOCA. These changes are addressed in the "Evaluation" portion of this 50.59 review.

Also, reclassifying the control room air intake radiation monitors as "Type A" instruments was not necessarily addressed in the AST submittals to the NRC. Therefore, this change is also explicitly addressed in the "Evaluation" portion of this 50.59 review.

Several sections of the TS Bases currently reference 10CFR100. Changes to these references are required, as the new dose acceptance criteria is 10CFR50.67 as a result of NRC approval of the AST submittal. This impacts the TS Bases for TS 3/4.4.5.2, TS 3/4.4.7, TS 3/4.6.1, TS 3/4.6.2, TS 3/4.6.6, TS 3/4.7.1, TS 3/4.9.9, and TRM 3.6.1.

One calculation (ECS03-008) which supports Waterford 3 Emergency Plan procedures was updated to support EPU. These calculations are loosely related to FSAR Chapter 15, therefore they were included in ER-W3-2004-0276-000. However, the changes affect indicators only and not the higher level Initiating Conditions classification elements. As such the E-Plan itself is not impacted. Note also that Table 4-3 of the E-Plan contains the results of a number of the Chapter 15 events, however that table is redundant with information already contained in the FSAR and is being deleted independent of AST. Emergency planning procedures are being reviewed and updated for EPU (as necessary) via ER-W3-2001-1149-000 (RFT 153).

The ODCM addresses normal operation effluents and is not impacted by the change in accident dose methodology. The ODCM does reference "10CFR100," however the reference is related to the site boundary as defined in 10CFR100 and note the accident dose consequence acceptance criteria identified in 10CFR100.11, which is being replaced in the Waterford 3 licensing basis by 10CFR50.67 upon NRC acceptance of AST.

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:

FSAR, Tech Spec Bases, TRM, FSAR
Questions, SER (NUREG-0787)

10CFR100, TID-14844, Thyroid (TRM and Tech Spec
Bases), "Whole Body" (TRM and Tech Spec Bases)

LBDs/Documents reviewed manually:

- FSAR Chapters 1, 6, 9, 12, and 15 were manually reviewed for the impact due to AST.

Submittal References:

Extended Power Uprate Submittals Pertinent to ER-W3-2004-0276-000

EPU1: W3F1-2003-0074 (includes the Power Uprate Report)

EPU2: W3F1-2004-0017

EPU3: W3F1-2004-0035

EPU4: W3F1-2004-0052

EPU5: W3F1-2004-0061

EPU6: W3F1-2004-0078

Alternate Source Term References (All pertinent)

AST1: W3F1-2004-0053 (Initial AST submittal: LB LOCA, SB LOCA, MSLB, SGTR, FWLB, CEA Ejection)

AST2: W3F1-2004-0071 (Supplement to AST: RCP Seized Rotor / Sheared Shaft, IOADV, Excess Main Steam Flow with Loss of Offsite Power, Letdown Line Break)

AST3: W3F1-2004-0076 (Revised LB LOCA)

AST4: W3F1-2004-0095

AST5: W3F1-2004-0101 (Revised LB LOCA, SGTR)

Licensing References:

Regulatory Guide 1.183: *Alternative Radiological Source Terms for Evaluating Design Basis Accidents for Nuclear Power Reactors*

NUREG-1465: *Accident Source Terms for Light Water Nuclear Power Plants*

NUREG-0800: *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants*

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 assumptions used in the AST analyses are depended upon NRC approval the AST submittal. Also, a number of the assumptions for AST are based on EPU operation in Cycle 14. These assumptions are not bounding for all scenarios due to the core design. Acceptable dose consequences are also dependent on a more stringent primary-to-secondary steam generator tube leakage value of 75 gpd which was requested as part of power uprate. Therefore this evaluation is also dependent upon NRC approval of the EPU license amendment request. ER-W3-2001-1149-000 is implementing EPU, therefore approval of that ER is required.

Physical plant modifications to implement AST include ER-W3-2005-0019-000 which will change the emergency feedwater (EFW) level control setpoint to ensure that the partition factor assumptions used in the AST analyses remain valid. Therefore, ER-W3-2005-0019-000 must be implemented prior to final implementation of AST.

Finally, all equipment qualification issues which were evaluated with AST are to be addressed via ER-W3-2004-0276-001, therefore approval of that ER is required prior to final implementation of AST.

The following information summarizes the FSAR changes and documents whether the change was contained in a submittal, or if it requires further evaluation under 10CFR50.59.

Licensing Basis Document Changes (Only Sections with changes due to this ER are included):

Section	Title	References	Comments
1.2	General Plant Description	AST1, AST2	All changes within AST submittal (AST1,AST2)
1.8	Comparison of Waterford 3 Design with NRC Regulatory Guide	AST1, AST2	All changes within AST submittal (AST1,AST2) with the exception of changes to Regulatory Guide 1.70 discussion. Those changes must be evaluated under 10CFR50.59 .
1.9	Three Mile Island – 2 (TMI-2) Action Plan Requirements for Applicants for an Operating License	AST1, AST2	Most within scope of AST (AST1,AST2). However, some changes required to document CVAS doses, thus portions of the changes to this Section (those related to CVAS filters) must be evaluated under 50.59
2.2	Nearby Industrial, Transportation, and Military Facilities	AST1, AST2	All changes within AST submittal (AST1,AST2)
3.2	Classification of Structures, Components, and Systems	AST1, AST2	All changes to this section will be made in ER-W3-2004-0276-001.
3.5	Missile Protection	AST1, AST2	All changes to this section will be made in ER-W3-2004-0276-001.
3.6	Protection Against Dynamic Effects Associated with the Postulated Rupture of Piping	AST1, AST2	All changes to this section will be made in ER-W3-2004-0276-001.
3.11	Environmental Design of Electrical Equipment	None	All changes to this section will be made in ER-W3-2004-0276-001.
5.4	Component and Subsystem Design	AST1, AST2	All changes within AST submittal (AST1,AST2)
6.0	Engineered Safety Features	AST1 through AST5	All changes within AST submittal
6.1	Engineered Safety Features Materials	AST1, AST3, AST5	All changes within AST submittal

<i>Section</i>	<i>Title</i>	<i>References</i>	<i>Comments</i>
6.2	Containment Systems	AST1, AST3, AST5	All changes within AST submittal
6.4	Habitability Systems	AST1, AST3, AST4, AST5	All changes within AST submittal
6.5	Fission Product Removal and Control Systems	AST1 through AST5	All changes within AST submittal
7.5	Safety Related Display Instrumentation	AST1 through AST5	The control room radiation monitors are credited in the accident analyses as discussed in the AST submittals. This changes the classification of the instruments which is not discussed in the submittal, therefore changes to this Section must be evaluated under 50.59.
9.3	Process Auxiliaries	AST1, AST2	All changes within AST submittal
9.4	Air Conditioning, Heating, Cooling, and Ventilation Systems	AST1 through AST5	All changes within AST submittal
12.2	Radiation Sources	AST1, AST3, AST4, AST5	The changes in this section (related to this ER) are within the scope of the AST submittals. (Note that the changes to this FSAR section are being made via ER-W3-2001-1149-011, however they are related to ER-W3-2004-0276-000 therefore they are included here. This also applies to the changes in Sections 12.3 and Appendix 12.3A)
12.3	Radiation Protection Design Features	AST1, AST3, AST4, AST5	The changes in this section (related to this ER) are within the scope of the AST submittals.
12.3A	TMI Shielding Study	None	Changes to this section related to the control room evaluations are within the scope of the AST submittals. The changes related to the CVAS and SBVS filter trains (other than control room doses) must be evaluated under 10CFR50.59.
15.0	Transient Analysis	AST1 through AST5	All changes are within AST submittals.
15.1	Increase in Heat Removal by the Secondary System (Turbine Plant)		
15.1.1	Moderate Frequency Events	EPUI, AST2	Changes to 15.1.1.4 made in accordance with IOSGADV AST analysis (AST2)
15.1.2	Infrequent Events	EPUI, AST2	Changes to 15.1.2.3 made in accordance with AST analysis (AST2) Changes to 15.1.2.4 made in accordance with AST IOSGADV analysis (AST2) (Moderate and Infrequent events evaluated together)
15.1.3	Limiting Faults	AST1	All changes within AST submittal
15.2	Decrease in Heat Removal by the Secondary System (Turbine Plant)		
15.2.1	Moderate Frequency Events	EPUI	All changes to this section are consistent with the PUR (EPUI)
15.2.2	Infrequent Events	EPUI	All changes to this section are consistent with the PUR (EPUI)
15.2.3	Limiting Faults	AST2, EPUI	Changes to 15.2.3.1 are made in accordance with the AST submittal (AST1). Changes to 15.2.3.2 are made in accordance with the PUR (EPUI)
15.3	Decrease in Reactor Coolant Flow Rate	AST2	Changes to 15.3.3.1 are made in accordance with the AST submittal (AST2)
15.4	Reactivity and Power Distribution Anomalies		

<i>Section</i>	<i>Title</i>	<i>References</i>	<i>Comments</i>
15.4.1	Moderate Frequency Events	EPU1	All changes to this section are consistent with the PUR (EPU1)
15.4.3	Limiting Faults	AST1	All changes to this section are consistent with the AST submittal (AST1)
15.6	Decrease in Reactor Coolant System Inventory	AST1 through AST5	Changes to 15.6.3.1 (Letdown line break) are made in accordance with Reference AST2 Changes to 15.6.3.2 (SGTR) are made in accordance with Reference AST5 (which revised the AST1 analysis) Changes to 15.6.3.3 (LOCA) are made in accordance with AST1 for SB LOCA and AST5 for LB LOCA (AST1 and AST3 contain superseded LB LOCA analyses)
15.7	Radioactive Release from a Subsystem or Component	AST1	Sections 15.7.3.1 and 15.7.3.2 are being deleted as they are no longer required per the SRP. This change must be reviewed under 10CFR50.59 All changes to 15.7.3.4 are in accordance with the AST submittal (AST1)
Chapter 15, Appendix B	Containment Leakage and Dose Rate Calculations	AST1, AST3, AST5 NUREG/CR-6604	All changes made in accordance with AST submittal. The NRC computer code RADTRAD is identified in AST1. The model is used in AST1, AST3, and AST5. NUREG/CR-6604 is the Users' Manual for RADTRAD and is included by reference in the AST submittals.
N/A	Technical Specification Bases	AST1, AST2	All changes made in accordance with the AST submittal
N/A	Technical Requirements Manual (Bases)	AST1, AST2	All changes made in accordance with the AST submittal

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:

- | | <u>Yes</u> | <u>No</u> | |
|-----|--------------------------|-------------------------------------|--|
| 1. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 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. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Involve a land disturbance of undisturbed land areas (i.e., grading activities, construction, excavations, reforestation, creating, or removing ponds)? |
| 3. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Involve dredging activities in a lake, river, pond, or stream? |
| 4. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Increase the amount of thermal heat being discharged to the river or lake? |
| 5. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Increase the concentration or quantity of chemicals being discharged to the river, lake, or air? |
| 6. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Discharge any chemicals new or different from that previously discharged? |
| 7. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Change the design or operation of the intake or discharge structures? |
| 8. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Modify the design or operation of the cooling tower that will change water or air flow characteristics? |
| 9. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 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. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Modify existing stationary fuel burning equipment (i.e., diesel fuel oil, butane, gasoline, propane, and kerosene)? ¹ |
| 11. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 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. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Involve the installation or use of equipment that will result in a new or additional air emission discharge? |
| 13. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Involve the installation or modification of a stationary or mobile tank? |
| 14. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Involve the use or storage of oils or chemicals that could be directly released into the environment? |
| 15. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 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:

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

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

This Section is not required per Section I.

IV. 50.59 EVALUATION

License Amendment Determination

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

Does the proposed Change:

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

BASIS:

As discussed previously, the only three items which do not meet the screening criteria (and thus must be evaluated here) are as follows:

- *Reclassifying the main control room air intake radiation monitors as Regulatory Guide 1.97, Type A instruments;*
- *Removal of Sections 15.7.3.1 and 15.7.3.2 from the FSAR; and*
- *Changes in the design basis due to consideration of the CVAS charcoal filter trains (with the exception of Equipment Qualification issues which will be evaluated by ER-W3-2004-0276-001).*

ER-W3-2004-0276-000 is analytical in nature. Physical plant modifications to implement AST include ER-W3-2005-0019-000 which will change the emergency feedwater (EFW) level control setpoint to ensure that the partition factor assumptions used in the AST analyses remain valid. However, that change will be addressed in that ER (and subsequent 50.59 review). All plant procedure changes required to meet the dose analyses included in the ER address post-accident functions, thus they are intended to mitigate the consequences of an event rather than prevent an event from occurring. The CVAS filters are only operated following a design basis accident (other than normal surveillances), thus addition of those filter trains to the plant radiological design basis has no impact to normal operation dose rates and doses. The control room air intake radiation monitors are not initiators of any event. FSAR Sections 15.7.3.1, "Radioactive Waste Gas System Leak or Failure," and 15.7.3.2, "Liquid Waste System Leak or Failure (Release to Atmosphere)," evaluates the dose consequences due to postulated events, thus the frequency of the events themselves are not impacted. Therefore, the changes from ER-W3-2004-0276-000 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 Yes
 structure, system, or component important to safety previously evaluated in the FSAR? No

BASIS:

The post-accident dose rates and doses increase as a result of ER-W3-2004-0276-000 in several radiation zones. These increased dose rates do not increase the likelihood of any equipment failures since no equipment exceeds its qualification dose (Note: The essential water chillers are addressed via ER-W3-2004-0546-000), therefore the equipment will operate as expected following an accident.

The various AST dose analyses credit control room operators' selection of the more favorable air intake as allowed by Regulatory Guides 1.183 and 1.194, as well as Standard Review Plan 6.4. To credit this selection the SRP requires that each intake have redundant radiation monitors in each air inlet. In some cases, this selection is required to ensure that the control room dose limits of 10CFR50.67 and GDC are not exceeded. As such, input from the monitors are required to ensure that the control room ventilation system is utilizing the more favorable air intake, thus meeting its design requirements following a postulated accident. The current monitors meet all of the requirements for Type A instruments so no additional modifications are required. Specifically, the monitors are located in a mild radiological environment (<1E4 Rads). The monitors are also not located in a harsh temperature environment, so the monitors meet the requirements of NUREG-0588 with respect to equipment qualification. The monitors are safety related and meet all seismic requirements. Redundant monitors are located in each intake and are powered by class 1E power. Also, the radiation monitors will isolate the control room on high radiation. Operators may then select the more favorable air intake to pressurize the control room (which is assumed

to occur at two hours). Since the monitors already meet all of the requirements for "Type A" instruments per RG 1.97, there is no impact to the radiation monitors which would potentially cause an increase in the likelihood of a malfunction. Also, plant procedures have been revised to provide adequate guidance to ensure that the control room operators will be directed to not only enter the pressurized mode of operation when necessary, but also to select the appropriate air intake. The assumptions concerning operator selection of the appropriate air intake are in accordance with SRP guidance, and they were explicitly included in the AST submittal.

Thus, 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:

FSAR Chapter 15 contains several accident scenarios which are no longer required. Specifically, FSAR 15.7.3.1 evaluates a Radioactive Waste Gas System Leak or Failure, and Section 15.7.3.2 evaluates a Liquid Waste System Leak or Failure (Release to Atmosphere). Both of these events have been deleted from the NRC Standard Review Plan in 1981, thus the NRC no longer requires them to be evaluated to ensure the health and safety of the public. Waterford 3 explicitly informed the NRC that these events were not being re-analyzed for EPU conditions in the PUR. Since the events are no longer included in the SRP, they are being deleted from the FSAR. The SRP has been revised and explicitly approved by the NRC to allow the deletion of FSAR 15.7.3.1 and 15.7.3.2 events, therefore deletion of these sections does not result in more than a minimal increase in consequences.

FSAR Section 12.3A documents the vital areas which would potentially require access following an accident. The doses to Emergency Diesel Generator "B" room (Zone O) increase as a result of the CVAS filters (CR-W3-2004-2690). Access to the room is not required to meet the assumptions of any design basis accident, therefore there would be no increase to the consequences of an event. While access to the room is not explicitly required following an accident, FSAR Section 12.3A.3.8 documents that access is desired once every 8 hours to monitor the EDG critical parameters. This access is possible even with the revised dose rates which include the CVAS filter trains. The other vital areas listed in Subsection 12.3A are not impacted.

This review concludes that the proposed changes do 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 area dose rates from the CVAS and SBVS filters were calculated assuming the worst set of assumptions to maximize the area dose rates. These assumptions corresponded to the failure of one train (since the area dose rates are based on the contact dose rates for each train). If two trains were assumed, then the radioactivity would simply be divided between the two trains which would reduce the contact dose rates. Since all equipment has been evaluated for these conservative dose rates and doses, the equipment will function as designed and there would be no impact to dose consequences.

The control room air intake radiation monitors already meet all of the requirements for "Type A" instruments. Independent, redundant monitors are located in each air intake to provide operators with the necessary information to select the more favorable air intake (thus, minimize control room doses). The air intake themselves are not susceptible to any single active failure, as redundant flow paths ensure that operators may use either intake during an event.

Based on this review it is concluded that this changes 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:

All accidents evaluated were submitted for NRC review and approval via either AST or EPU. Since this ER does not impact any equipment, it 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 ER does not make any physical plant modifications, it simply implements revised analyses which are currently in the FSAR. Physical plant modifications to implement AST include ER-W3-2005-0019-000 which will change the emergency feedwater (EFW) level control setpoint to ensure that the partition factor assumptions used in the AST analyses remain valid. However, that change will be addressed in that ER (and subsequent 50.59 review). As discussed in Question 2, the equipment can withstand post accident environments, so these changes do not create the possibility of a malfunction. Since this ER does not impact any equipment, it 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:

This ER implements changes to the plant design and licensing basis due to revised safety analyses. These safety analyses were submitted to the NRC for their review and approval. The remaining issues addressed by the ER which were not directly submitted to the NRC do not impact fission product barriers. Specifically, the CVAS charcoal filter trains are used to mitigate the consequences of an accident. The system does not interact with any fission product barrier. Similarly, the control room air intake radiation monitors only alert control room operators of increased activity levels at the air intakes, and do not directly or indirectly impact any fission product barrier. Finally, FSAR Sections 15.7.3.1 and 15.7.3.2 do not explicitly impact a fission product barrier, these FSAR sections were used to address event consequences and are no longer required as previously approved by the NRC.

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:

Regulatory Guide 1.183 provides guidance for implementing the AST dose methodology into the plant design and licensing basis. One requirement is that licensees submit revised dose analyses using AST. Waterford 3 submitted all required information to the NRC. All of the issues with the current design and licensing basis were addressed via AST or with TID-14844 which is the current licensing basis of the plant (RG 1.183 allows the TID methodology to continue to be used as long as the results bound AST).

FSAR Sections 15.7.3.1, "Radioactive Waste Gas System Leak or Failure," and 15.7.3.2, "Liquid Waste System Leak or Failure (Release to Atmosphere)," evaluates the dose consequences due to postulated events. The Waterford 3 PUR explained that these events were not being updated for EPU since (1) it has been removed from the SRP, and (2) it is not required to be addressed per Section 2.7 of draft Review Standard RS-001, "Review Standard for Extended Power Uprates. The events currently in the SAR were not updated for EPU conditions as documented in the PUR, therefore they would not necessarily represent EPU conditions. Since the events are no longer required per the SRP or the extended power uprate review standard, the NRC does not require them to be evaluated to ensure the health and safety of the public. NRC has effectively approved removal of these events from the FSAR.

Since all issues were addressed using the current methodology or AST, and FSAR Sections 15.7.3.1 and 15.7.3.2 are no longer required to be evaluated per the SRP, ER-W3-2004-0276-00 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.