

I. OVERVIEW / SIGNATURES

Facility: Waterford 3

Document Reviewed: ER-W3-2005-0396-000 Change/Rev.: R0System Designator(s)/Description: **Revise FSAR table 9.1-8 to reflect the changes made in the Holtec Calculation HI-961562, Revision 1.**

Description of Proposed Activity: CR-WF3-2005-778 documents that during the preparation of Echelon confirmatory criticality calculations for Cycle-14 of Waterford-3, two errors were discovered in Holtec International Report HI-961562, "Criticality Calculation Package for Waterford 3," dated March, 1997. This report was incorporated into the Waterford-3 document control system as Safety Related Calculation ECS98-006. One error was conservative and changes were not made for this error. The other error was non-conservative. This error resulted in an increase in the maximum calculated K_{eff} of the spent fuel racks increasing from 0.9284 to 0.9318. HOLTEC issued Revision 1 to the calculation on 3/15/05. ECS98-006 is being revised to incorporate the Revision 1 of the HOLTEC calculation.

The revision to the calculation impacts data contained in FSAR table 9.1-8 and the FSAR Section 9.1 references. This ER makes the necessary changes to the FSAR.

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>05-024</u>) | Sections I, II, and IV required |

Preparer: Van McAdams / Van McAdams / EOII/Reactor Engineering/9/7/05
Name (print) / Signature / Company / Department / Date

Reviewer: T. Gode / [Signature] / EOII/Reactor Engineering/9-14-05
Name (print) / Signature / Company / Department / Date

OSRC: Jaron Layne / [Signature] / 9/14/05
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 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| TS | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 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 LI-113. (See LI-101 for exceptions.)

| LBDs controlled under 50.59 | YES | NO | CHANGE # (if applicable) and/or SECTIONS IMPACTED |
|--|-------------------------------------|-------------------------------------|---|
| FSAR | <input checked="" type="checkbox"/> | <input type="checkbox"/> | ER-W3-2005-0396-000 to revise Table 9.1-8. |
| TS Bases | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Technical Requirements Manual | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 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 by initiating an LBD change in accordance with NMM LI-113. If obtaining NRC approval, document the LBD change in Section II.A.5. However, the change cannot be implemented until approved by the NRC. Complete Section II.

| 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 LI-113.

¹ If "YES," see LI-101. 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 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 applicable. If obtaining NRC approval, document the change in Section II.A.5. However, the change cannot be implemented until approved by the NRC. Complete Section II.

3. Basis

Explain why the proposed activity does or does not impact the Operating License/Technical Specifications and/or the FSAR. If the proposed activity involves a potential test or experiment not previously described in the FSAR also include an explanation. 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.

FSAR

A search of the Autonomy 50.59_Search database using the keywords noted below found that this change impacts SER 980111 and FSAR Table 9.1-8. The Evaluation section of the SER states that the criticality calculation for Region 1 resulted in a maximum K_{eff} of 0.9284. Revision 1 of the calculation found the maximum K_{eff} of 0.9318. However, the conclusion of the SER remains valid. FSAR Table 9.1-8 provides tolerances for the spent fuel racks, uncertainties for the calculation and reactivity results that are changed by this revision of the calculation. The reference to the HOLTEC report in FSAR section 9.1 is also impacted.

Operating License/Technical Specifications

The search of the Autonomy 50.59_Search database using the keywords noted below and a manual review of Technical Specification Section 5.6 showed that the operating license and Technical Specifications are not impacted by this change.

Test or Experiment

This change does not constitute a test or experiment and therefore does not involve a potential test or experiment not previously 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. **NOTE: Ensure that manual searches are performed using controlled copies of the documents. If you have any questions, contact your site Licensing department.**

Electronic search method used:

Keywords: "Spent Fuel" NEAR10 "Critical", "Spent Fuel" NEAR10 K_{eff} , "Holtec", "ECS98-006"

Autonomy 50.59_Search

LBDs reviewed manually:

FSAR Section 9.1.2, Technical Specifications
Section 5.6

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 EV-115 and attached to this 50.59 Review. Consider both routine and non-routine (emergency) discharges when answering these questions.

Will the proposed activity being evaluated:

- | | <u>YES</u> | <u>NO</u> | |
|-----|--------------------------|-------------------------------------|--|
| 1. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Involve a land disturbance equal to or 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 any 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, ditch, 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 new or different chemicals that are currently not authorized for use by the state regulatory agency? |
| 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? ¹ |
| 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 EV-117 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? |

The Security Department answers the following question if one of questions C.1 through C.10 above was answered "yes."

Is a change to the Security Plan required? Yes No

Attach to this 50.59 Review or reference below documentation for accepting a "yes" answer for any of Questions C.1 through C.10, above.

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

D. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) SCREENING

(NOTE: This section is not applicable to Grand Gulf or 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," a 72.48 Review must be performed in accordance with NMM Procedure LI-112 and attached to this 50.59 Review.

Will the proposed activity being evaluated:

- | | <u>YES</u> | <u>NO</u> | |
|-----|--------------------------|--------------------------|--|
| 1. | <input type="checkbox"/> | <input type="checkbox"/> | Any activity that directly impacts spent fuel cask storage or loading operations? |
| 2. | <input type="checkbox"/> | <input type="checkbox"/> | Involve the ISFSI including the concrete pad, security fence, and lighting? |
| 3. | <input type="checkbox"/> | <input 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 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 type="checkbox"/> | Involve a change to the Fuel Building or Control Room(s) radiation monitoring? |
| 6. | <input type="checkbox"/> | <input 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 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 type="checkbox"/> | Involve a change to the Fuel Building electrical power that could potentially impact cask loading or storage activities? |
| 9. | <input type="checkbox"/> | <input type="checkbox"/> | Involve a change to the Fuel Building ventilation that could potentially impact cask loading or storage activities? |
| 10. | <input type="checkbox"/> | <input type="checkbox"/> | Involve a change to the ISFSI security? |
| 11. | <input type="checkbox"/> | <input type="checkbox"/> | Involve a change to off-site radiological release projections from non-ISFSI sources? |
| 12. | <input type="checkbox"/> | <input type="checkbox"/> | Involve a change to spent fuel characteristics? |
| 13. | <input type="checkbox"/> | <input type="checkbox"/> | Redefine/change heavy load pathways? |
| 14. | <input type="checkbox"/> | <input type="checkbox"/> | Involve fire and explosion protection near or in the on-site transport paths or near the ISFSI? |
| 15. | <input type="checkbox"/> | <input type="checkbox"/> | Involve a change to the loading bay or supporting components power that could potentially impact cask loading or storage activities? |
| 16. | <input type="checkbox"/> | <input type="checkbox"/> | New structures near the ISFSI? |
| 17. | <input type="checkbox"/> | <input type="checkbox"/> | Modifications to any plant systems that support dry fuel storage activities? |
| 18. | <input type="checkbox"/> | <input type="checkbox"/> | Involve a change to the nitrogen supply, service air, demineralized water or borated water system in the Fuel Building? |

N/A

III. 50.59 EVALUATION EXEMPTION

A. Check the applicable box below. If a box is 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:

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. 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.
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.

N/A

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: The accident described in the FSAR is a fuel handling accident. The design function of the spent fuel racks is to maintain the fuel subcritical with a K_{eff} of less than 0.95 assuming the spent fuel is flooded with nonborated water and to maintain a subcritical array of K_{eff} less than 0.95 under all design loadings. The increase in the maximum K_{eff} from 0.9284 to 0.9318 is a marginal increase that maintains the design basis of the spent fuel racks, i.e., K_{eff} less than 0.95. This change has no impact on the seismic qualification of the spent fuel racks. This change has no impact on any initiators of accidents analyzed in the FSAR and therefore, will not increase the frequency of a fuel handling accident.

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: As stated above the function of the spent fuel racks is to maintain the fuel subcritical with a K_{eff} of less than 0.95. An increase in K_{eff} to 0.9318 will maintain the spent fuel more than 5% subcritical as analyzed in and required by the FSAR. Therefore, this change will not increase the likelihood of a criticality event or a fuel handling accident.

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

BASIS: The marginal increase in total K_{eff} from 0.9284 to 0.9318 will still ensure that the K_{eff} of the fuel will remain below 0.95 and that the fuel will remain subcritical under all conditions and for any fuel handling accidents. The increase in K_{eff} will not impact any of the equipment required to mitigate the consequences of a fuel handling accident. Therefore, this activity will not result in an increase in the consequences of a fuel handling accident.

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

BASIS: The increase in the analyzed K_{eff} of the fuel will maintain the fuel subcritical. This change does not have any impact on the failure mode of the spent fuel racks or any other structures, systems, or components important to safety. Therefore, this change will not increase the consequences of any SSC malfunction.

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

BASIS: The K_{eff} of the spent fuel only has an impact on a fuel handling accident. Since the spent fuel will remain subcritical with a K_{eff} of less than 0.95 this change will not create the possibility of an accident of a different type than previously 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: Increasing the K_{eff} of the spent fuel where the K_{eff} remains below 0.95 does not create a new failure mode of the spent fuel racks or any SSC nor does it change the result of the failure of the spent fuel racks or any SSC. The spent fuel will remain more than 5% subcritical under all conditions.

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 spent fuel is stored in the spent fuel racks outside the RCS boundary and containment. Therefore, the only fission product barrier that can be affected by this change is the fuel cladding. Since this change will ensure that the spent fuel will remain more than 5% subcritical this barrier will not be challenged by this change.

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 of analyzing the subcriticality of the spent fuel has not changed. A change was made in the dimensions of the spent fuel racks entered into the calculation based on the tolerances of the racks to ensure the worst case K_{eff} was calculated. Therefore the method of evaluation has not changed.

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 LI-113.