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J. E. Pollock
Site Vice President
Administration

NL-11-130

December 15, 2011

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station O-P1-17
Washington, DC 20555-0001

Subject: **Indian Point Nuclear Power Plant Units 2 and 3**
Response to Request for Additional Information Regarding the Inter-Unit
Spent Fuel Transfer License Amendment Request (TAC Nos. ME1671,
ME1672, and L24299)
Indian Point Units 2 & 3
Docket Nos. 50-247 and 50-286
License Nos. DPR-26 and DPR-64

References:

- 1) NRC letter to Indian Point Vice President of Operations, 11/09/11, "Indian Point Nuclear Generating Unit Nos. 2 and 3 – Request for Additional Information Regarding Amendment Application for Inter-Unit Spent Fuel Transfer (TAC Nos. ME1671, ME1672, and L24299)"
- 2) Entergy letter NL-09-076, 07/08/09, "Indian Point Nuclear Power Plant Units 2 and 3 - Application for Unit 2 Operating License Condition Change and Units 2 and 3 Technical Specification Changes to Add Inter-Unit Spent Fuel Transfer Requirements"
- 3) Entergy letter NL-09-100, 09/28/09, "Indian Point Nuclear Power Plant Units 2 and 3 – Response to Request for Supplemental Information Regarding the Spent Fuel Transfer License Amendment Request (TAC Nos. ME1671, ME1672, and L24299)"
- 4) Entergy letter NL-10-093, 10/05/10, "Indian Point Nuclear Power Plant Units 2 and 3 – Response to Request for Additional Information Regarding the Inter-Unit Spent Fuel Transfer License Amendment Request (TAC Nos. ME1671, ME1672, and L24299)"
- 5) Entergy letter NL-11-052, 07/28/11, "Indian Point Nuclear Power Plant Units 2 and 3 – Response to Request for Additional Information Regarding the Inter-Unit Spent Fuel Transfer License Amendment Request (TAC Nos. ME1671, ME1672, and L24299)"

A001
NRC

- 6) Entergy letter NL-11-118, 10/28/11, "Indian Point Nuclear Power Plant Units 2 and 3 – Response to Request for Additional Information Regarding the Inter-Unit Spent Fuel Transfer License Amendment Request (TAC Nos. ME1671, ME1672, and L24299)"

Dear Sir or Madam:

This letter provides Entergy Nuclear Operations, Inc (Entergy) response to the NRC Request for Additional Information (RAI) (Reference 1) regarding the Entergy license amendment requests concerning inter-unit transfer of fuel (Reference 2), the supplement to the amendment request (Reference 3), and the responses to previous RAIs (References 4, 5 and 6). Entergy and the NRC agreed to a submittal date of December 16th, 2011 for the Reference 1 RAIs to accommodate a pre-submittal conference call which was held on December 13th, 2011. Based on that call, Entergy is submitting responses to all RAIs with the exception of RAI 14. The response to RAI 14 requires additional evaluation and the response will be provided by January 12, 2012.

The RAI responses are provided in Attachment 1. These responses have necessitated changes to the proposed IP2 and IP3 Appendix C TS. The revised IP2 and IP3 Appendix C TS are provided in Attachments 2 and 3, respectively.

This submittal includes a revision to the licensing report (HI-2094289, Enclosure 1), which integrates the RAI responses, supporting calculations and supporting documentation, and provides the regulatory basis for this submittal. Enclosure 2 contains Holtec International supporting reports and evaluations. The additional supporting information provided in this submittal does not alter the conclusion that this proposed activity does not constitute a significant hazard, as documented in Reference 2.

This submittal includes information deemed proprietary by an entity that is providing support to Entergy on this project. As such, in Enclosure 3, a 10 CFR 2.390 affidavit has been executed by the owner of the information. A non proprietary version of this submittal will be provided by January 12, 2012.

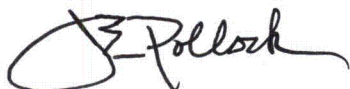
There are no new regulatory commitments in this submittal.

In accordance with 10 CFR 50.91, a copy of this submittal, with non proprietary attachments, is being provided to the designated New York State official.

If you have any questions or require additional information, please contact Mr. Robert Walpole, Licensing Manager at 914-254-6710.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge. Executed on 12-15-2011.

Sincerely,



JEP/rw

Attachments and Enclosures:

- Attachment 1: Response to Request for Additional Information (Holtec Proprietary)
- Attachment 2: Indian Point Unit 2 - Appendix C to the Operating License Inter-Unit Fuel Transfer Technical Specifications
- Attachment 3: Indian Point Unit 3 - Appendix C to the Operating License Inter-Unit Fuel Transfer Technical Specifications

- Enclosure 1: Holtec International Licensing Report HI-2094289, Revision 5 (Holtec Proprietary)
- Enclosure 2: Holtec International Supporting Reports and Evaluations (Holtec Proprietary)
- Enclosure 3: Affidavit executed pursuant to 10 CFR 2.390 governing the proprietary information included in the Holtec reports and evaluations

cc: NRC Resident Inspector's Office
Mr. John Boska, Senior Project Manager, NRC NRR DORL
Mr. William M. Dean, Regional Administrator, NRC Region 1
Mr. Francis J. Murray Jr., President and CEO, NYSERDA (w/o proprietary information)
Mr. Paul Eddy, New York State Dept. of Public Service (w/o proprietary information)

ENCLOSURE 3 TO NL-11-130

Affidavit executed pursuant to 10 CFR 2.390 governing the proprietary information included in the Holtec reports and evaluations.

Entergy Nuclear Operations, Inc.
Indian Point Units 2 and 3
Docket Nos. 50-247 and 50-286

AFFIDAVIT PURSUANT TO 10 CFR 2.390

I, Tammy S. Morin, being duly sworn, depose and state as follows:

- (1) I have reviewed the information described in paragraph (2) which is sought to be withheld, and am authorized to apply for its withholding.
- (2) The information sought to be withheld is Holtec reports and documents contained in the Attachments (exclusive of Attachment "A") to Holtec letter Document ID 1775044, containing Holtec Proprietary information.
- (3) In making this application for withholding of proprietary information of which it is the owner, Holtec International relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4) and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10CFR Part 9.17(a)(4), 2.390(a)(4), and 2.390(b)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information", and some portions also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

AFFIDAVIT PURSUANT TO 10 CFR 2.390

- (4) Some examples of categories of information which fit into the definition of proprietary information are:
- a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by Holtec's competitors without license from Holtec International constitutes a competitive economic advantage over other companies;
 - b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product.
 - c. Information which reveals cost or price information, production, capacities, budget levels, or commercial strategies of Holtec International, its customers, or its suppliers;
 - d. Information which reveals aspects of past, present, or future Holtec International customer-funded development plans and programs of potential commercial value to Holtec International;
 - e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs 4.a, and 4.b above.

- (5) The information sought to be withheld is being submitted to the NRC in confidence. The information (including that compiled from many sources) is of a sort customarily held in confidence by Holtec International, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by Holtec International. No public disclosure has been made, and it is not available in public sources. All disclosures to third parties, including any required transmittals to the NRC, have

AFFIDAVIT PURSUANT TO 10 CFR 2.390

been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

- (6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within Holtec International is limited on a "need to know" basis.
- (7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his designee), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside Holtec International are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.
- (8) The information classified as proprietary was developed and compiled by Holtec International at a significant cost to Holtec International. This information is classified as proprietary because it contains detailed descriptions of analytical approaches and methodologies not available elsewhere. This information would provide other parties, including competitors, with information from Holtec International's technical database and the results of evaluations performed by Holtec International. A substantial effort has been expended by Holtec International to develop this information. Release of this information would improve a competitor's position because it would enable Holtec's competitor to copy our technology and offer it for sale in competition with our company, causing us financial injury.

AFFIDAVIT PURSUANT TO 10 CFR 2.390

- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to Holtec International's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of Holtec International's comprehensive spent fuel storage technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology, and includes development of the expertise to determine and apply the appropriate evaluation process.

The research, development, engineering, and analytical costs comprise a substantial investment of time and money by Holtec International.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

Holtec International's competitive advantage will be lost if its competitors are able to use the results of the Holtec International experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to Holtec International would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive Holtec International of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools.

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Document ID 1775044
Non-Proprietary Attachment

AFFIDAVIT PURSUANT TO 10 CFR 2.390

STATE OF NEW JERSEY)
) ss:
COUNTY OF BURLINGTON)

Tammy S. Morin, being duly sworn, deposes and says:

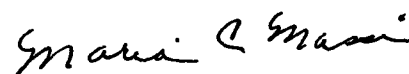
That she has read the foregoing affidavit and the matters stated therein are true and correct to the best of her knowledge, information, and belief.

Executed at Marlton, New Jersey, this 14th day of December, 2011.



Tammy S. Morin
Holtec International

Subscribed and sworn before me this 14th day of December, 2011.



MARIA C. MASSI
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires April 25, 2015



Holtec-Center, 555 Lincoln Drive West, Marlton, NJ 08053
Telephone (856) 797-0900
Fax (856) 797-0909

December 14th, 2011

Mr. Roger Waters
Licensing Specialist
Indian Point Energy Center
450 Broadway
GSB Second Floor Licensing
Buchanan, NY 10511-0249

Document ID: 1775044

Subject: Information to Support Licensing Submittal on Inter-Unit Fuel Transfer

Dear Mr. Waters:

Holtec is pleased to approve the release of the following information to the United States Nuclear Regulatory Commission (USNRC):

- Attachment A - Responses to NRC RAI dated 11/9/2011 (Proprietary)
- Attachment B - HI-2084176R7, "Shielded Transfer Canister Criticality Calculation"
(Proprietary)
- Attachment C- CRC benchmarking for RAI Response to Question #17 (Proprietary)

We require that you include this letter along with the attached affidavit pursuant to 10CFR2.390 when submitting Attachments B and C to the USNRC.



Holtec Center, 555 Lincoln Drive West, Marlton, NJ 08053
Telephone (856) 797-0900
Fax (856) 797-0909

The responses to NRC questions have been authored and reviewed by the following individuals:

Response Number	Author	Reviewer
Criticality	Stefan Anton	Kaushik Banerjee

Please do not hesitate to contact me at 856-797-0900 x 3703 if you have any questions.

Sincerely,

Veena Gubbi
Adjunct Project Manager
Holtec International

ATTACHMENT 2 TO NL-11-130

**Indian Point Unit 2
Appendix C to the Operating License
Inter-Unit Fuel Transfer Technical Specifications**

Entergy Nuclear Operations, Inc.
Indian Point Unit 2
Docket No. 50-247

APPENDIX C
TO
FACILITY OPERATING LICENSE
FOR
ENTERGY NUCLEAR INDIAN POINT 2, LLC (ENIP2)
AND
ENTERGY NUCLEAR OPERATIONS, INC. (ENO)

INDIAN POINT NUCLEAR
GENERATING UNIT No. 2

INTER-UNIT FUEL TRANSFER TECHNICAL SPECIFICATIONS

PART I: SPENT FUEL TRANSFER CANISTER AND TRANSFER CASK SYSTEM

FACILITY LICENSE NO. DPR-26

DOCKET NO. 50-247

Amendment No.

SPENT FUEL SHIELDED TRANSFER CANISTER AND TRANSFER CASK SYSTEM

1.0 DESCRIPTION

The spent fuel transfer system consists of the following components: (1) a spent fuel shielded transfer canister (STC), which contains the fuel; (2) a transfer cask (HI-TRAC 100D) (hereafter referred to as HI-TRAC), which contains the STC during transfer operations; and (3) a bottom missile shield.

The STC and HI-TRAC are designed to transfer irradiated nuclear fuel assemblies from the INDIAN POINT 2 (IP3) spent fuel pit to the Indian Point 2 (IP2) spent fuel pit. A fuel basket within the STC holds the fuel assemblies and provides criticality control. The shielded transfer canister provides the confinement boundary, water retention boundary, gamma radiation shielding, and heat rejection capability. The HI-TRAC provides a water retention boundary, protection of the STC, gamma and neutron radiation shielding, and heat rejection capability. The STC contains up to 12 fuel assemblies.

The STC is the confinement system for the fuel. It is a welded, multi-layer steel and lead cylinder with a welded base-plate and bolted lid. The inner shell of the canister forms an internal cylindrical cavity for housing the fuel basket. The outer surface of the canister inner shell is buttressed with lead and steel shells for radiation shielding. The minimum thickness of the steel, lead and steel shells relied upon for shielding starting with the innermost shell are $\frac{3}{4}$ inch steel, 2 $\frac{3}{4}$ inch lead and $\frac{3}{4}$ inch steel, respectively. The canister closure incorporates two O-ring seals to ensure its confinement function. The confinement system consists of the canister inner shell, bottom plate, top flange, top lid, top lid O-ring seals, vent port seal and cover plate, and drain port seal and coverplate. The fuel basket, for the transfer of 12 Pressurized Water Reactor (PWR) fuel assemblies, is a fully welded, stainless steel, honeycomb structure with neutron absorber panels attached to the individual storage cell walls under stainless steel sheathing. The maximum gross weight of the fully loaded STC is 40 tons.

The HI-TRAC is a multi-layer steel and lead cylinder with a bolted bottom (or pool) and top lid. For the fuel transfer operation the HI-TRAC is fitted with a solid top lid, an STC centering assembly, and a bottom missile shield. The inner shell of the transfer cask forms an internal cylindrical cavity for housing the STC. The outer surface of the cask inner shell is buttressed with intermediate lead and steel shells for radiation shielding. The minimum thickness of the steel, lead and steel shells relied upon for shielding starting with the innermost shell are $\frac{3}{4}$ inch steel, 2 $\frac{7}{8}$ inch lead and 1 inch steel, respectively. An outside shell called the "water jacket" contains water for neutron shielding, with a minimum thickness of 5". The HI-TRAC bottom and top lids incorporates a gasket seal design to ensure its water confinement function. The water confinement system consists of the HI-TRAC inner shell, bottom lid, top lid, top lid seal, bottom lid seal, vent port seal, vent port cap and bottom drain plug.

The HI-TRAC provides a water retention boundary, protection of the STC, gamma and neutron radiation shielding, and heat rejection capability. The bottom missile shield is attached to the bottom of the HI-TRAC and provides tornado missile protection of the pool lid bolted joint. The HI-TRAC can withstand a tornado missile in other areas without the need for additional shielding. The STC centering assembly provides STC position control within the HI-TRAC and also acts as an internal impact limiter in the event of a non-mechanistic tipover accident.

Facility Operating License
Appendix C – Inter-Unit Fuel Transfer Technical Specifications

2.0 CONDITIONS

2.1 OPERATING PROCEDURES

Written operating procedures shall be prepared for cask handling, loading, movement, surveillance, maintenance, and recovery from off normal conditions such as crane hang-up. The written operating procedures shall be consistent with the technical basis described in Chapter 10 of the Licensing Report (Holtec International Report HI-2094289).

2.2 ACCEPTANCE TESTS AND MAINTENANCE PROGRAM

Written cask acceptance tests and maintenance program shall be prepared consistent with the technical basis described in Chapter 8 of the Licensing Report (Holtec International Report HI-2094289).

2.3 PRE-OPERATIONAL TESTING AND TRAINING EXERCISE

A training exercise of the loading, closure, handling/transfer, and unloading, of the equipment shall be conducted prior to the first transfer. The training exercise shall not be conducted with irradiated fuel. The training exercise may be performed in an alternate step sequence from the actual procedures, but all steps must be performed. The training exercise shall include, but is not limited to the following:

- a) Moving the STC into the IP3 spent fuel pool.
- b) Preparation of the HI-TRAC for STC loading.
- c) Selection and verification of specific fuel assemblies and non-fuel hardware to ensure type conformance.
- d) Loading specific assemblies and placing assemblies into the STC (using a single dummy fuel assembly), including appropriate independent verification.
- e) Remote installation of the STC lid and removal of the STC from the spent fuel pool.
- f) Placement of the STC into the HI-TRAC with the STC centering assembly.
- g) STC closure, establishment of STC water level with steam, verification of STC water level, STC leakage testing, and operational steps required prior to transfer, as applicable.
- h) Establishment and verification of HI-TRAC water level.
- i) Installation of the HI-TRAC top lid.
- j) HI-TRAC closure, leakage testing, and operational steps required prior to transfer, as applicable.
- k) Movement of the HI-TRAC with STC from the IP3 fuel handling building to the IP2 fuel handling building along the haul route with designated devices.
- l) Moving the STC into the IP2 spent fuel pool.
- m) Manual crane operations for bare STC movements including demonstration of recovery from a crane hang-up with the STC suspended from the crane.

APPENDIX C
TO
FACILITY OPERATING LICENSE
FOR
ENERGY NUCLEAR INDIAN POINT 2, LLC (ENIP2)
AND
ENERGY NUCLEAR OPERATIONS, INC. (ENO)

INDIAN POINT NUCLEAR
GENERATING UNIT No. 2

INTER-UNIT FUEL TRANSFER TECHNICAL SPECIFICATIONS

PART II: TECHNICAL SPECIFICATIONS

FACILITY LICENSE NO. DPR-26

DOCKET NO. 50-247

Amendment No.

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1.0 USE AND APPLICATION

1.1 Definitions

-----NOTE-----

The defined terms of this section appear in capitalized type and are applicable throughout these Technical Specifications and Bases.

<u>Term</u>	<u>Definition</u>
ACTIONS	ACTIONS shall be that part of a Specification that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.
INTACT FUEL ASSEMBLIES	INTACT FUEL ASSEMBLIES are fuel assemblies without known or suspected cladding defects greater than pinhole leaks or hairline cracks, and which can be handled by normal means. Fuel assemblies without fuel rods in fuel rod locations shall not be classified as INTACT FUEL ASSEMBLIES unless dummy fuel rods are used to displace an amount of water greater than or equal to that displaced by the original fuel rod(s).
LOADING OPERATIONS	LOADING OPERATIONS include all licensed activities on an STC while it is being loaded with fuel assemblies and while the STC is being placed in the HI-TRAC. LOADING OPERATIONS begin when the first fuel assembly is placed in the STC and end when the HI-TRAC is suspended from or secured on the TRANSPORTER.
NON-FUEL HARDWARE (NFH)	NFH is defined as Burnable Poison Rod Assemblies (BPRAs), Thimble Plug Devices (TPDs), Wet Annular Burnable Absorbers (WABAs), Rod Cluster Control Assemblies (RCCAs), Neutron Source Assemblies (NSAs), Hafnium Flux Suppressors, and Instrument Tube Tie Rods (ITTRs).
TRANSFER OPERATIONS	TRANSFER OPERATIONS include all licensed activities performed on a HI-TRAC loaded with one or more fuel assemblies when it is being moved after LOADING OPERATIONS or before UNLOADING OPERATIONS. TRANSFER OPERATIONS begin when the HI-TRAC is first suspended from or secured on the transporter and end when the TRANSPORTER is at its destination and the HI-TRAC is no longer secured on or suspended from the transporter.
TRANSPORTER	TRANSPORTER is the device or vehicle which moves the HI-TRAC. The TRANSPORTER can either support the HI-TRAC from underneath or the HI-TRAC can be suspended from it.

(continued)

1.1 Definitions (continued)

<u>Term</u>	<u>Definition</u>
UNLOADING OPERATIONS	UNLOADING OPERATIONS include all licensed activities on an STC or HI-TRAC while it is being unloaded of the contained fuel assemblies. UNLOADING OPERATIONS begin when the HI-TRAC is no longer suspended from or secured on the TRANSPORTER and end when the last fuel assembly is removed from the STC.
ZR	ZR means any zirconium-based fuel cladding authorized for use in a commercial nuclear power plant reactor.

1.0 USE AND APPLICATION

1.2 Logical Connectors

PURPOSE The purpose of this section is to explain the meaning of logical connectors.

Logical connectors are used in Technical Specifications (TS) to discriminate between, and yet connect, discrete Conditions, Required Actions, Completion Times, Surveillances, and Frequencies. The only logical connectors that appear in TS are AND and OR. The physical arrangement of these connectors constitutes logical conventions with specific meanings.

BACKGROUND Several levels of logic may be used to state Required Actions. These levels are identified by the placement (or nesting) of the logical connectors and by the number assigned to each Required Action. The first level of logic is identified by the first digit of the number assigned to a Required Action and the placement of the logical connector in the first level of nesting (i.e., left justified with the number of the Required Action). The successive levels of logic are identified by additional digits of the Required Action number and by successive indentions of the logical connectors.

When logical connectors are used to state a Condition, Completion Time, Surveillance, or Frequency, only the first level of logic is used, and the logical connector is left justified with the statement of the Condition, Completion Time, Surveillance, or Frequency.

(continued)

1.2 Logical Connectors (continued)

EXAMPLES The following examples illustrate the use of logical connectors.

EXAMPLE 1.2-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 VERIFY . . . <u>AND</u> A.2 Restore . . .	

In this example the logical connector AND is used to indicate that when in Condition A, both Required Actions A.1 and A.2 must be completed.

(continued)

1.2 Logical Connectors (continued)

EXAMPLES
(continued)

EXAMPLE 1.2-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Stop . . . <u>OR</u> A.2.1 Verify . . . <u>AND</u> A.2.2.1 Reduce . . . <u>OR</u> A.2.2.2 Perform . . . <u>OR</u> A.3 Remove . . .	

This example represents a more complicated use of logical connectors. Required Actions A.1, A.2, and A.3 are alternative choices, only one of which must be performed as indicated by the use of the logical connector OR and the left justified placement. Any one of these three ACTIONS may be chosen. If A.2 is chosen, then both A.2.1 and A.2.2 must be performed as indicated by the logical connector AND. Required Action A.2.2 is met by performing A.2.2.1 or A.2.2.2. The indented position of the logical connector OR indicates that A.2.2.1 and A.2.2.2 are alternative choices, only one of which must be performed.

1.0 USE AND APPLICATION

1.3 Completion Times

PURPOSE	The purpose of this section is to establish the Completion Time convention and to provide guidance for its use.
BACKGROUND	Limiting Conditions for Operation (LCOs) specify the lowest functional capability or performance levels of equipment required for safe operation of the facility. The ACTIONS associated with an LCO state Conditions that typically describe the ways in which the requirements of the LCO can fail to be met. Specified with each stated Condition are Required Action(s) and Completion Times(s).
DESCRIPTION	<p>The Completion Time is the amount of time allowed for completing a Required Action. It is referenced to the time of discovery of a situation (e.g., equipment or variable not within limits) that requires entering an ACTIONS Condition unless otherwise specified, providing the Spent Fuel Shielded Transfer Canister and Transfer Cask System is in a specified condition stated in the Applicability of the LCO. Required Actions must be completed prior to the expiration of the specified Completion Time. An ACTIONS Condition remains in effect and the Required Actions apply until the Condition no longer exists or the Spent Fuel Shielded Transfer Canister and Transfer Cask System is not within the LCO Applicability.</p> <p>Once a Condition has been entered, subsequent subsystems, components, or variables expressed in the Condition, discovered to be not within limits, will <u>not</u> result in separate entry into the Condition unless specifically stated. The Required Actions of the Condition continue to apply to each additional failure, with Completion Times based on initial entry into the Condition.</p>

(continued)

1.3 Completion Times (continued)

EXAMPLES

The following examples illustrate the use of Completion Times with different types of Conditions and changing Conditions.

EXAMPLE 1.3-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Perform Action B.1	12 hours
	<u>AND</u> B.2 Perform Action B.2	36 hours

Condition B has two Required Actions. Each Required Action has its own separate Completion Time. Each Completion Time is referenced to the time that Condition B is entered.

The Required Actions of Condition B are to complete action B.1 within 12 hours AND complete action B.2 within 36 hours. A total of 12 hours is allowed for completing action B.1 and a total of 36 hours (not 48 hours) is allowed for completing action B.2 from the time that Condition B was entered. If action B.1 is completed within 6 hours, the time allowed for completing action B.2 is the next 30 hours because the total time allowed for completing action B.2 is 36 hours.

(continued)

1.3 Completion Times (continued)

EXAMPLES
(continued)

EXAMPLE 1.3-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One system not within limit.	A.1 Restore system to within limit.	7 days
B. Required Action and associated Completion Time not met.	B.1 Complete action B.1.	12 hours
	<u>AND</u> B.2 Complete action B.2.	36 hours

When a system is determined not to meet the LCO, Condition A is entered. If the system is not restored within 7 days, Condition B is also entered and the Completion Time clocks for Required Actions B.1 and B.2 start. If the system is restored after Condition B is entered, Conditions A and B are exited, and therefore, the Required Actions of Condition B may be terminated.

(continued)

1.3 Completion Times (continued)

EXAMPLES
(continued)

EXAMPLE 1.3-3

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each component.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Restore compliance with LCO.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Complete action B.1.	6 hours
	<u>AND</u> B.2 Complete action B.2.	12 hours

The Note above the ACTIONS table is a method of modifying how the Completion Time is tracked. If this method of modifying how the Completion Time is tracked was applicable only to a specific Condition, the Note would appear in that Condition rather than at the top of the ACTIONS Table.

The Note allows Condition A to be entered separately for each component, and Completion Times tracked on a per component basis. When a component is determined to not meet the LCO, Condition A is entered and its Completion Time starts. If subsequent components are determined to not meet the LCO, Condition A is entered for each component and separate Completion Times start and are tracked for each component.

IMMEDIATE
COMPLETION
TIME

When "Immediately" is used as a Completion Time, the Required Action should be pursued without delay and in a controlled manner.

1.0 USE AND APPLICATION

1.4 Frequency

PURPOSE	The purpose of this section is to define the proper use and application of Frequency requirements.
DESCRIPTION	<p>Each Surveillance Requirement (SR) has a specified Frequency in which the Surveillance must be met in order to meet the associated Limiting Condition for Operation (LCO). An understanding of the correct application of the specified Frequency is necessary for compliance with the SR.</p> <p>The "specified Frequency" is referred to throughout this section and each of the Specifications of Section 3.0, Surveillance Requirement (SR) Applicability. The "specified Frequency" consists of the requirements of the Frequency column of each SR.</p> <p>Situations where a Surveillance could be required (i.e., its Frequency could expire), but where it is not possible or not desired that it be performed until sometime after the associated LCO is within its Applicability, represent potential SR 3.0.4 conflicts. To avoid these conflicts, the SR (i.e., the Surveillance or the Frequency) is stated such that it is only "required" when it can be and should be performed. With an SR satisfied, SR 3.0.4 imposes no restriction.</p>

(continued)

1.4 Frequency (continued)

EXAMPLES

The following examples illustrate the various ways that Frequencies are specified.

EXAMPLE 1.4-1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Verify pressure within limit	12 hours

Example 1.4-1 contains the type of SR most often encountered in the Technical Specifications (TS). The Frequency specifies an interval (12 hours) during which the associated Surveillance must be performed at least one time. Performance of the Surveillance initiates the subsequent interval. Although the Frequency is stated as 12 hours, an extension of the time interval to 1.25 times the interval specified in the Frequency is allowed by SR 3.0.2 for operational flexibility. The measurement of this interval continues at all times, even when the SR is not required to be met per SR 3.0.1 (such as when the equipment or variables are outside specified limits, or the facility is outside the Applicability of the LCO). If the interval specified by SR 3.0.2 is exceeded while the facility is in a condition specified in the Applicability of the LCO, the LCO is not met in accordance with SR 3.0.1.

If the interval as specified by SR 3.0.2 is exceeded while the facility is not in a condition specified in the Applicability of the LCO for which performance of the SR is required, the Surveillance must be performed within the Frequency requirements of SR 3.0.2 prior to entry into the specified condition. Failure to do so would result in a violation of SR 3.0.4.

(continued)

1.4 Frequency (continued)

EXAMPLES
(continued)

EXAMPLE 1.4-2

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Verify flow is within limits.	Once within 12 hours prior to starting activity <u>AND</u> 24 hours thereafter

Example 1.4-2 has two Frequencies. The first is a one time performance Frequency, and the second is of the type shown in Example 1.4-1. The logical connector "AND" indicates that both Frequency requirements must be met. Each time the example activity is to be performed, the Surveillance must be performed within 12 hours prior to starting the activity.

The use of "once" indicates a single performance will satisfy the specified Frequency (assuming no other Frequencies are connected by "AND"). This type of Frequency does not qualify for the 25% extension allowed by SR 3.0.2.

"Thereafter" indicates future performances must be established per SR 3.0.2, but only after a specified condition is first met (i.e., the "once" performance in this example). If the specified activity is canceled or not performed, the measurement of both intervals stops. New intervals start upon preparing to restart the specified activity.

2.0 NOT USED

This section is intentionally left blank

3.0 LIMITING CONDITIONS FOR OPERATION (LCO) APPLICABILITY

LCO 3.0.1	LCOs shall be met during specified conditions in the Applicability, except as provided in LCO 3.0.2.
LCO 3.0.2	<p>Upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met, except as provided in LCO 3.0.5.</p> <p>If the LCO is met or is no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required, unless otherwise stated.</p>
LCO 3.0.3	Not applicable.
LCO 3.0.4	When an LCO is not met, entry into a specified condition in the Applicability shall not be made except when the associated ACTIONS to be entered permit continued operation in the specified condition in the Applicability for an unlimited period of time. This Specification shall not prevent changes in specified conditions in the Applicability that are required to comply with ACTIONS or that are related to the unloading of an STC.
LCO 3.0.5	Equipment removed from service or not in service in compliance with ACTIONS may be returned to service under administrative control solely to perform testing required to demonstrate it meets the LCO or that other equipment meets the LCO. This is an exception to LCO 3.0.2 for the system returned to service under administrative control to perform the testing.

3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY

SR 3.0.1 SRs shall be met during the specified conditions in the Applicability for individual LCOs, unless otherwise stated in the SR. Failure to meet a Surveillance, whether such failure is experienced during the performance of the Surveillance or between performances of the Surveillance, shall be failure to meet the LCO. Failure to perform a Surveillance within the specified Frequency shall be failure to meet the LCO except as provided in SR 3.0.3. Surveillances do not have to be performed on equipment or variables outside specified limits.

SR 3.0.2 The specified Frequency for each SR is met if the Surveillance is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met.

For Frequencies specified as “once,” the above interval extension does not apply. If a Completion Time requires periodic performance on a “once per...” basis, the above Frequency extension applies to each performance after the initial performance.

Exceptions to this Specification are stated in the individual Specifications.

SR 3.0.3 If it is discovered that a Surveillance was not performed within its specified Frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Frequency, whichever is less. This delay period is permitted to allow performance of the Surveillance.

If the Surveillance is not performed within the delay period, the LCO must immediately be declared not met, and the applicable Condition(s) must be entered.

When the Surveillance is performed within the delay period and the Surveillance is not met, the LCO must immediately be declared not met, and the applicable Condition(s) must be entered.

SR 3.0.4 Entry into a specified condition in the Applicability of an LCO shall not be made unless the LCO's Surveillances have been met within their specified Frequency. This provision shall not prevent entry into specified conditions in the Applicability that are required to comply with Actions or that are related to the unloading of an STC.

3.1 INTER-UNIT FUEL TRANSFER

3.1.1 Boron Concentration

LCO 3.1.1 The boron concentration of the water in the Spent Fuel Pit and the STC shall be ≥ 2000 ppm.

APPLICABILITY: Whenever one or more fuel assemblies are in the STC.

-----NOTE-----
Only applicable to the spent fuel pit when the STC is in the spent fuel pit

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Boron concentration not within limit.	A.1 Suspend LOADING OPERATIONS or UNLOADING OPERATIONS.	Immediately
	<u>AND</u>	
	A.2 Suspend positive reactivity additions.	Immediately
	<u>AND</u>	
	A.3 Initiate action to restore boron concentration to within limit.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
-----NOTE----- This surveillance is only required to be performed if the STC is submerged in water in the spent fuel pool or if water is added to, or recirculated through, the STC when the STC is in the HI-TRAC. Any added water must meet the boron concentration requirement of LCO 3.1.1. -----	Once, within 4 hours prior to entering the Applicability of this LCO.
	<u>AND</u>
SR 3.1.1.1 Verify the boron concentration is within limit using two separate measurements.	Once per 48 hours thereafter.

3.1 INTER-UNIT FUEL TRANSFER

3.1.2 Shielded Transfer Canister (STC) Loading

LCO 3.1.2 INTACT FUEL ASSEMBLIES placed into the Shielded Transfer Canister (STC) shall be classified in accordance with Table 3.1.2-1 based on initial enrichment and burnup and shall be restricted based on the following:

- a. INTACT FUEL ASSEMBLIES classified as Type 2 may be placed in any location of the STC basket (see Figure 3.1.2-1) with the following restrictions:
 1. Post-irradiation cooling time, initial enrichment, and allowable average burnup shall be within the limits for the cell locations as specified in Table 3.1.2-3;
 2. Decay heat including NON FUEL HARDWARE \leq 650 Watts (any cell);
 3. Decay heat including NON FUEL HARDWARE \leq 1105 Watts (cell 1, 2, 3 or 4);
 4. Post-irradiation cooling time and the maximum average burnup of NON FUEL HARDWARE shall be within the cell locations and limits specified in Table 3.1.2-2. In accordance with Table 3.1.2-2 RCCAs, NSAs, and Hafnium Flux Suppressors cannot be placed in locations 5, 6, 7, 8, 9, 10, 11, 12 of the STC basket.

- NOTE -

If one or more Type 1 fuel assemblies are in the STC, cells 1, 2, 3, AND 4 must be empty, with a cell blocker installed that prevents inserting fuel assemblies and/or NON-FUEL HARDWARE.

- b. INTACT FUEL ASSEMBLIES classified as Type 1 or Type 2 may be placed in locations 5, 6, 7, 8, 9, 10, 11, 12 of the STC basket (see Figure 3.1.2-1) with the following restrictions:
 1. Post-irradiation cooling time, initial enrichment, and allowable average burnup shall be within the limits for the cell locations as specified in Table 3.1.2-3;
 2. Decay heat including NON FUEL HARDWARE \leq 650 Watts;
 3. Post-irradiation cooling time and the maximum average burnup of NON FUEL HARDWARE shall be within the cell locations and limits specified in Table 3.1.2-2. In accordance with Table 3.1.2-2 RCCAs, NSAs, and Hafnium Flux Suppressors cannot be placed in locations 5, 6, 7, 8, 9, 10, 11, 12 of the STC basket.

APPLICABILITY: Whenever one or more fuel assemblies are in the STC.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One or more fuel assemblies in the STC do not meet the LCO limits.</p>	<p>A.1.1 Initiate action to restore compliance with LCO 3.1.2.</p> <p><u>OR</u></p> <p>A.1.2 Initiate action to move fuel to the IP3 spent fuel pit in accordance with IP3 Appendix A Technical Specification LCO 3.7.16.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.1.2.1 Verify by administrative means that the fuel assembly meets the requirements specified in the LCO for placement in the STC.</p>	<p>Prior to placing the fuel assembly in the STC.</p>
<p>SR 3.1.2.2 Verify by visual inspection that a cell blocker which prevents inserting fuel assemblies and/or NON-FUEL HARDWARE into cells 1, 2, 3, and 4 of the STC is installed.</p>	<p>Prior to placing a Type 1 fuel assembly in the STC.</p>

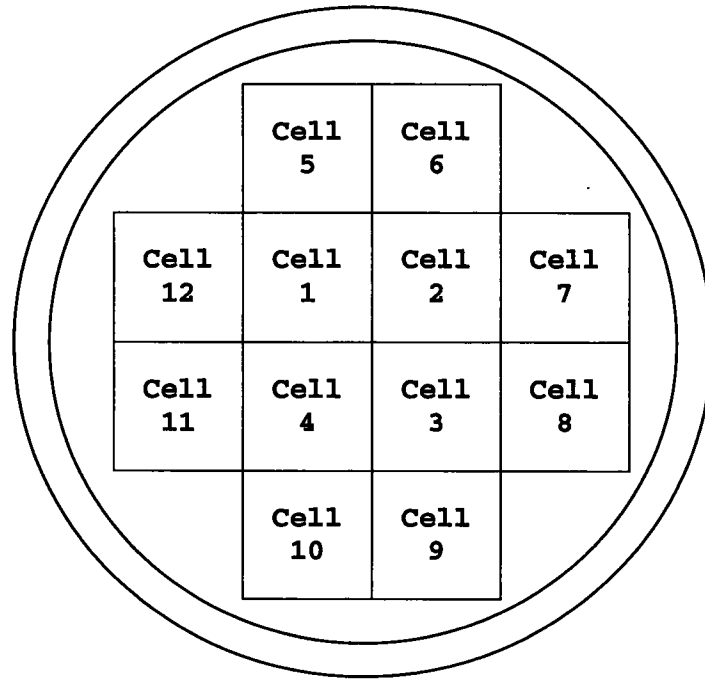


Figure 3.1.2-1
Shielded Transfer Canister Layout
(Top View)

Table 3.1.2-1
Minimum Burnup Requirements at Varying Initial Enrichments^(a)

Maximum Assembly Initial Enrichment ^{(f)(g)} (wt% U235)	Configuration A ^(c) Minimum Assembly Average Burnup (MWD/MTU) ^(b)	Configuration B ^(d) Minimum Assembly Average Burnup (MWD/MTU) ^(b)
2.0	5,400	6,000
2.5	13,800	18,800
3.0	22,100	28,600
3.5	30,000	37,300
4.0	36,900	44,600
4.5	42,700	52,500
5.0	48,700	Note (e)

- (a) Fuel that does not meet the minimum assembly average burnup at a given initial enrichment is classified as Type 1 fuel. Fuel that meets the minimum assembly average burnup at a given initial enrichment is classified as Type 2 fuel.
- (b) Linear interpolation between enrichment levels to determine minimum burnup requirements is permitted.
- (c) Assemblies that have not been located in any cycle under a control rod bank that was permitted to be inserted during full power operation or where it can be shown that the insertion did not exceed 8 inches below the top of the active fuel.
- (d) Assemblies that have been located under a control rod bank that was permitted to be inserted during full power operation and where the insertion was more than 8 inches below the top of the active fuel. This configuration also applies to fuel assemblies that have contained a Hafnium Flux Suppressor.
- (e) Configuration B assemblies with enrichment greater than 4.5 are classified as Type 1 fuel.
- (f) Natural or enriched uranium blankets are not considered in determining the fuel assembly average enrichment for comparison to the minimum allowed initial average enrichment.
- (g) Rounding to one decimal place to determine initial enrichment is not permitted.

Table 3.1.2-2

NON FUEL HARDWARE^(a) Post Irradiation Cooling Times and Allowable Average Burnup

Post-irradiation Cooling Time (years)	Maximum Burnup (MWD/MTU)				
	BPRAs and WABAs ^(b)	TPDs ^{(b)(c)}	RCCAs	Hafnium Flux Suppressors	NSAs ^(c)
≥ 6	≤ 20000	N/A	≤ 630000	≤ 20000	N/A
≥ 7	-	≤ 20000	-	-	N/A
≥ 8	≤ 30000	-	-	≤ 30000	N/A
≥ 9	≤ 40000	≤ 30000	-	-	N/A
≥ 10	≤ 50000	≤ 40000	-	-	N/A
≥ 11	≤ 60000	≤ 45000	-	-	N/A
≥ 12	-	≤ 50000	-	-	N/A
≥ 13	-	≤ 60000	-	-	N/A
≥ 14	-	-	-	-	N/A
≥ 15	-	≤ 90000	-	-	N/A
≥ 16	-	≤ 630000	-	-	N/A
≥ 20	-	-	-	-	≤ 360000
Allowed Quantity and Location	Up to twelve (12) per transfer in any location	Up to twelve (12) per transfer in any location	Up to four (4) per transfer in Cells 1, 2, 3, and/or 4	Up to four (4) per transfer in Cells 1, 2, 3, and/or 4	One per transfer in Cell 1, 2, 3, or 4

- (a) NON-FUEL HARDWARE burnup and cooling time limits are not applicable to Instrument Tube Tie Rods (ITTRs), since they are installed post-irradiation.
- (b) Linear interpolation between points is only permitted for BPRAs, WABAs, and TPDs, with the exception that interpolation is not permitted for TPDs with burnups greater than 90 GWd/MTU and cooling times greater than 15 years.
- (c) N/A means not authorized for loading at this cooling time.

Table 3.1.2-3
Allowable STC Loading Configurations

Configuration ^(c)	Cells 1, 2, 3, 4 ^{(a)(b)}	Cells 5, 6, 7, 8, 9, 10, 11, 12 ^{(a)(b)}
1	Burnup ≤ 55,000 MWD/MTU Cooling time ≥ 10 years Initial Enrichment ≥ 3.4 wt% U-235	Burnup ≤ 40,000 MWD/MTU Cooling time ≥ 25 years Initial Enrichment ≥ 2.3 wt% U-235
2	Burnup ≤ 45,000 MWD/MTU Cooling time ≥ 10 years Initial Enrichment ≥ 3.2 wt% U-235	Burnup ≤ 45,000 MWD/MTU Cooling time ≥ 20 years Initial Enrichment ≥ 3.2 wt% U-235
3	Burnup ≤ 55,000 MWD/MTU Cooling time ≥ 10 years Initial Enrichment ≥ 3.4 wt% U-235	Burnup ≤ 45,000 MWD/MTU Cooling time ≥ 20 years Initial Enrichment ≥ 3.2 wt% U-235
4	Burnup ≤ 45,000 MWD/MTU Cooling time ≥ 10 years Initial Enrichment ≥ 3.6 wt% U-235	Burnup ≤ 40,000 MWD/MTU Cooling time ≥ 12 years Initial Enrichment ≥ 3.2 wt% U-235
5	Burnup ≤ 45,000 MWD/MTU Cooling time ≥ 14 years Initial Enrichment ≥ 3.4 wt% U-235	Burnup ≤ 40,000 MWD/MTU Cooling time ≥ 12 years Initial Enrichment ≥ 3.2 wt% U-235
6	Burnup ≤ 45,000 MWD/MTU Cooling time ≥ 20 years Initial Enrichment ≥ 3.2 wt% U-235	Burnup ≤ 40,000 MWD/MTU Cooling time ≥ 20 years Initial Enrichment ≥ 2.3 wt% U-235

- (a) Initial enrichment is the assembly average enrichment. Natural or enriched uranium blankets are not considered in determining the fuel assembly average enrichment for comparison to the minimum allowed initial average enrichment.
- (b) Rounding to one decimal place to determine initial enrichment is permitted.
- (c) Fuel with five middle Inconel spacers are limited to cells 1, 2, 3, and 4 for all loading configurations except loading configuration 6 which allows fuel with Inconel spacers in all cells.

3.1 INTER-UNIT FUEL TRANSFER

3.1.3 Shielded Transfer Canister (STC) Initial Water Level

LCO 3.1.3 The established water level in the STC shall be 9.0+0.5/-1.5 inches below the bottom of the STC lid.

APPLICABILITY: Prior to TRANSFER OPERATIONS when the STC is in the HI-TRAC and the STC lid has been installed.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. STC water level not within limit.</p>	<p>-----NOTE----- Water used for level restoration must meet the boron concentration requirement of LCO 3.1.1. ----- A.1 Initiate action to restore STC water level.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.1.3.1 Verify the initial STC water level is within limit by verifying the following during STC water level establishment:</p> <ul style="list-style-type: none"> a. steam is emitted from the STC drain tube; and b. the volume of water removed is \geq 35.4 gallons and \leq 47.9 gallons. 	<p>Once prior to TRANSFER OPERATIONS.</p>

3.1 INTER-UNIT FUEL TRANSFER

3.1.4 Shielded Transfer Canister (STC) Pressure Rise

LCO 3.1.4 The pressure rise in the STC cavity shall be \leq 0.2 psi/hr averaged over a rolling 4 hour period.

APPLICABILITY: Over a 24 hour period after successful completion of LCO 3.1.3 and prior to TRANSFER OPERATIONS when the STC is in the HI-TRAC and the STC lid has been installed.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Rate of STC cavity pressure rise not within limit.	A.1.1 Establish a vent path on the STC. <u>AND</u> -----NOTE----- Water used for recirculation must meet the boron concentration requirement of LCO 3.1.1. -----	Immediately
	A.1.2 Begin circulation of borated water in the STC to establish and maintain the STC water exit temperature < 180°F. <u>AND</u>	
	A.1.3 Begin actions to determine the reason for exceeding the pressure rise limit.	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action A.1.3 indicates a fuel misload.	B.1.1 Return the STC to the spent fuel pool and remove the STC lid. AND	12 hours
	B.1.2 Return any misloaded fuel to the IP3 spent fuel pit in accordance with IP3 Appendix A Technical Specification LCO 3.7.16.	24 hours
C. Required Action A.1.3 does not indicate a fuel misload.	C.1 Develop and initiate corrective actions necessary to return the STC to compliance with LCO 3.1.3 and LCO 3.1.4.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.1.4.1 -----NOTE-----</p> <p>Pressure measurements shall be taken once upon establishing required water level AND hourly thereafter for 24 hours. Pressure may initially drop during pressure stabilization.</p> <p>-----</p> <p>Verify by direct measurement that the rate of STC cavity pressure rise is within limit.</p>	<p>Once prior to TRANSFER OPERATIONS.</p>
<p>SR 3.1.4.2 Verify that an ASME code compliant pressure relief valve or rupture disc and two channels of pressure instrumentation with a range of at least 0.1 psia to 15 psia and calibrated to within 1% accuracy within the past 12 months are installed on the STC.</p>	<p>During performance of SR 3.1.4.1.</p>

3.1 INTER-UNIT FUEL TRANSFER

3.1.5 Shielded Transfer Canister (STC) Unloading

-----NOTE-----

1. Only IP3 spent fuel assemblies are permitted to be in the STC.
 2. Once each IP3 spent fuel assembly removed from the STC has been placed in an IP2 spent fuel rack location and disconnected from the spent fuel pit bridge crane, it may not be returned to the STC.
 3. For fuel assemblies exposed to Hafnium Flux Suppressors during irradiation the burnup of the assembly used to classify the fuel for unloading into the IP2 spent fuel pit shall be the burnup prior to the exposure to the Hafnium Flux Suppressor.
-

LCO 3.1.5 IP3 spent fuel assemblies transferred to IP2 via the STC must be either in an approved IP2 spent fuel pit storage rack location per IP2 Appendix A Technical Specification LCO 3.7.13, in their authorized STC fuel basket cell, or be in transit between these two locations.

APPLICABILITY: Whenever the STC is in the Unit 2 spent fuel pit.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more fuel assemblies not in the required location.	A.1 Initiate action to restore compliance with LCO 3.1.5	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.5.1 Verify by administrative means that a fuel assembly returned to the STC has been re-loaded into the same STC cell from which it was removed.	Once, after each re-loaded fuel assembly is returned to the STC.

4.0 DESIGN FEATURES

4.1 Inter-Unit Fuel Transfer

4.1.1 Fuel Assemblies

Fuel assemblies selected for inter-unit transfer of fuel shall meet the fuel characteristics specified in Table 4.1.1-1.

4.1.2 Criticality

4.1.2.1 The Shielded Transfer Canister (STC) is designed and shall be maintained with:

- a. Fuel assemblies having a maximum U-235 enrichment of 5.0 weight percent;
- b. $k_{\text{eff}} \leq 0.95$ if fully flooded with unborated water;
- c. A nominal 9.218 inch center-to-center distance between fuel assemblies placed in the STC basket;
- d. Basket cell ID: 8.79 in. (nominal);
- e. Basket cell wall thickness: 0.28 in. (nominal);
- f. B_4C in the Metamic neutron absorber: ≥ 31.5 wt.% and ≤ 33.0 wt.%;
- g. The B_4C in the Metamic neutron absorber will contain boron with an isotopic B-10 content of at least 18.4%;
- h. Metamic panel thickness: ≥ 0.102 in.;
- i. The size and location of the neutron absorber panels shall be in accordance with drawing 6015 of the Licensing Report (Holtec International Report HI-2094289).

4.1.2.2 Drainage

The STC is designed and shall be maintained to prevent inadvertent draining.

4.1.2.3 Capacity

The STC is designed and shall be maintained with a capacity of no more than 12 fuel assemblies.

(continued)

4.0 DESIGN FEATURES (continued)

4.1.3 Codes and Standards

The American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), 2004 Edition, is the governing Code for the STC, as clarified below, except for Code Sections V and IX. The latest effective editions of ASME Code Sections V and IX, including addenda, may be used for activities governed by those sections, provided a written reconciliation of the later edition against the 2004 Edition, is performed. Table 4.1.3-1 lists approved alternatives to the ASME Code for the design of the STC.

4.1.4 Geometric Arrangements and Process Variables

The following are geometric arrangements and process variables that require a one time verification as part of each inter-unit fuel transfer operation:

1. **LOADING OPERATIONS, TRANSFER OPERATIONS, and UNLOADING OPERATIONS** shall only be conducted with working area ambient temperatures $\geq 0^{\circ}\text{F}$.
2. **LOADING OPERATIONS** shall only be conducted when the spent fuel pit water temperature and the fuel handling building ambient temperatures are both $\leq 100^{\circ}\text{F}$.
3. **LOADING OPERATIONS** shall only be conducted when the IP3 spent fuel pit contains no unirradiated fuel assemblies.
4. **LOADING OPERATIONS** shall only be conducted when the irradiated fuel assemblies in the IP3 spent fuel pit have been subcritical for at least 90 days.
5. **TRANSFER OPERATIONS** shall only be conducted when the outside air temperature is $\leq 100^{\circ}\text{F}$.
6. **TRANSFER OPERATIONS** shall only be conducted when the STC trunnions are offset from the HI-TRAC trunnions in the azimuthal direction by at least 30 degrees.
7. **TRANSFER OPERATIONS** shall only be conducted after STC seal leak tests have demonstrated no detected leakage when tested to a sensitivity of 1×10^{-3} ref-cm³/s in accordance with the "pre-shipment" test requirements of ANSI N14.5.
8. Prior to installing the HI-TRAC lid the HI-TRAC water level shall be verified by two separate inspections to be within $+0/-1$ inch of the top of the STC lid.

(continued)

4.0 DESIGN FEATURES (continued)

9. TRANSFER OPERATIONS shall only be conducted after the combined leak rate through the HI-TRAC top lid and vent port cover seals are confirmed to be water tight using an acceptable leak test from ANSI N14.5 and the pool lid seal is verified to be water tight by visual inspection.
10. TRANSFER OPERATIONS shall not occur with a TRANSPORTER that contains > 50 gallons of diesel fuel.

Table 4.1.1-1
Fuel Assembly Characteristics

Fuel Assembly Class	15x15 ^(a)
No. of Fuel Rod Locations	204
Cladding Type	ZR
Guide/Instrument Tube Type	ZR
Design Initial U (kg/assembly)	≤ 473
Fuel Rod Clad O.D. (in)	≥ 0.422
Fuel Rod Clad I.D. (in)	≤ 0.3734
Fuel Pellet Diameter (in)	≤ 0.3659
Fuel Rod Pitch (in)	≤ 0.563
Active Fuel Length (in)	≤ 144
Fuel Assembly Length (in)	≤ 160
Fuel Assembly Width (in)	≤ 8.54
No. of Guide and/or Instrument Tubes	21
Guide/Instrument Tube Thickness (in)	≥ 0.017
Axial Blanket Enrichment (wt % U-235) ^(b)	≤ 3.2
Axial Blanket Length (in) ^(b)	≥ 6

(a) All dimensions are design nominal values. Maximum and minimum dimensions are specified to bound variations in design nominal values among fuel assemblies within the 15x15 class.

(b) Applicable only if axial blankets are present.

(continued)

4.0 DESIGN FEATURES (continued)

Table 4.1.3-1 (page 1 of 2)

List of ASME Code Alternatives for the STC

Component	Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
STC Confinement Boundary	ND-1000	Statement of requirements for Code stamping of components.	Cask confinement boundary is designed, and will be fabricated in accordance with ASME Code, Section III, Subsection ND to the maximum practical extent, but Code stamping is not required.
STC Confinement Boundary	ND-2000	Requires materials to be supplied by ASME-approved material supplier.	Holtec approved suppliers will supply materials with CMTRs per ND-2000.
STC and STC basket assembly	ND-3100 NG-3100	Provides requirements for determining design loading conditions, such as pressure, temperature, and mechanical loads.	These requirements are not applicable. The Licensing Report, serving as the Design Specification, establishes the service conditions and load combinations for fuel transfer.
STC Confinement Boundary	ND-7000	Vessels are required to have overpressure protection.	No overpressure protection is provided. Function of cask vessel is as a radionuclide confinement boundary under normal and hypothetical accident conditions. Cask is designed to withstand maximum internal pressure and maximum accident temperatures.
STC Confinement Boundary	ND-8000	States requirement for name, stamping and reports per NCA-8000	STC to be marked and identified in accordance with drawing 6013 ^(a) . Code stamping is not required. QA data package prepared in accordance with Holtec's approved QA program.

4.0 DESIGN FEATURES (continued)

Table 4.1.3-1 (page 2 of 2)

List of ASME Code Alternatives for the STC

Component	Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
STC Basket Assembly	NG-4420	NG-4427(a) requires a fillet weld in any single continuous weld may be less than the specified fillet weld dimension by not more than 1/16 inch, provided that the total undersize portion of the weld does not exceed 10 percent of the length of the weld. Individual undersize weld portions shall not exceed 2 inches in length.	<p>Modify the Code requirement (intended for core support structures) with the following text prepared to accord with the geometry and stress analysis imperatives for the fuel basket: For the longitudinal STC basket fillet welds, the following criteria apply: 1) The specified fillet weld throat dimension must be maintained over at least 92 percent of the total weld length. All regions of undersized weld must be less than 3 inches long and separated from each other by at least 9 inches. 2) Areas of undercuts and porosity beyond that allowed by the applicable ASME Code shall not exceed 1/2 inch in weld length. The total length of undercut and porosity over any 1-foot length shall not exceed 2 inches. 3) The total weld length in which items (1) and (2) apply shall not exceed a total of 10 percent of the overall weld length. The limited access of the STC basket panel longitudinal fillet welds makes it difficult to perform effective repairs of these welds and creates the potential for causing additional damage to the basket assembly (e.g., to the neutron absorber and its sheathing) if repairs are attempted. The acceptance criteria provided in the foregoing have been established to comport with the objectives of the basket design and preserve the margins demonstrated in the supporting stress analysis.</p> <p>From the structural standpoint, the weld acceptance criteria are established to ensure that any departure from the ideal, continuous fillet weld seam would not alter the primary bending stresses on which the design of the fuel baskets is predicated. Stated differently, the permitted weld discontinuities are limited in size to ensure that they remain classifiable as local stress elevators ("peak stress", F, in the ASME Code for which specific stress intensity limits do not apply).</p>
STC Basket Assembly	NG-8000	States requirements for nameplates, stamping and reports per NCA-8000.	STC basket to be marked and identified in accordance with drawing 6015 ^(a) . No Code stamping is required. The STC basket data package is to be in conformance with Holtec's QA program.

(a) Holtec International Report HI-2094289

5.0 PROGRAMS

The following programs shall be established, implemented and maintained.

5.1 Transport Evaluation Program

- a. For lifting of the loaded STC or loaded HI-TRAC using equipment which is integral to a structure governed by 10 CFR Part 50 regulations, 10 CFR 50 requirements apply.
- b. This program is not applicable when the loaded HI-TRAC is in the fuel building or is being handled by equipment providing support from underneath (e.g., on air pads).
- c. The loaded HI-TRAC may be lifted to any height necessary during TRANSFER OPERATIONS provided the lifting equipment is designed in accordance with items 1, 2, and 3 below.
 1. The metal body and any vertical columns of the lifting equipment shall be designed to comply with stress limits of ASME Section III, Subsection NF, Class 3 for linear structures. All vertical compression loaded primary members shall satisfy the buckling criteria of ASME Section III, Subsection NF.
 2. The horizontal cross beam and any lifting attachments used to connect the load to the lifting equipment shall be designed, fabricated, operated, tested, inspected, and maintained in accordance with applicable sections and guidance of NUREG-0612, Section 5.1. This includes applicable stress limits from ANSI N14.6.
 3. The lifting equipment shall have redundant drop protection features which prevent uncontrolled lowering of the load.
- d. The lift height of the loaded HI-TRAC above the transport route surface or other supporting surface shall be limited to 6 inches, except as provided in Specification 5.1.c.

5.2 Metamic Coupon Sampling Program

A coupon surveillance program shall be implemented to maintain surveillance of the Metamic neutron absorber material under the radiation, chemical, and thermal environment of the STC.

The surveillance program will be implemented to monitor the performance of Metamic by installing a minimum of four bare coupons near the maximum gamma flux elevation (mid height) at no less than four circumferential downcomer areas around the STC fuel basket. At any time during its use the STC must have a minimum of one coupon installed in each quadrant. Metamic coupons used for testing must have been installed during the entire fuel loading history of the STC.

The following specifications apply:

- (i) Coupon size will be nominally 4" x 6". Each coupon will be marked with a unique identification number.

(continued)

5.0 PROGRAMS (continued)

- (ii) Pre-characterization testing: Before installation, each coupon will be measured and weighed. The measurements shall be taken at locations pre-specified in the test program. Each coupon shall be tested by neutron attenuation before installation in the STC. The weight, length, width, thickness, and results of the neutron attenuation testing shall be documented and retained.
- (iii) Four coupons shall be tested at the end of each inter-unit fuel transfer campaign. A campaign shall not last longer than two years. The coupons shall be measured and weighed and the results compared with the pre-characterization testing data. The results shall be documented and retained.
- (iv) The coupons shall be examined for any indication of swelling, delamination, edge degradation, or general corrosion. The results of the examination shall be documented and retained.
- (v) The coupons shall be tested by neutron attenuation and the results compared with the pre-characterization testing data. The results of the testing shall be documented and retained. Results are acceptable if the measured value is within +/-2.5% of the value measured for the same coupon at manufacturing.
- (vi) The coupons shall be returned to their locations in the STC unless anomalous material behavior is found. If the results indicate anomalous material behavior, evaluation and corrective actions shall be pursued.

5.3 Technical Specifications (TS) Bases Control Program

This program provides a means for processing changes to the Bases of these Technical Specifications.

- a. Changes to the Bases of the TS shall be made under appropriate administrative controls and reviews.
- b. Licensees may make changes to Bases without prior NRC approval provided the changes do not involve either of the following:
 - 1. a change in the TS incorporated in the license; or
 - 2. a change to the updated FSAR or Bases that requires NRC approval pursuant to 10 CFR 50.59.
- c. The Bases Control Program shall contain provisions to ensure that the Bases are maintained consistent with the UFSAR.
- d. Proposed changes that do not meet the criteria of Specification 5.3.b above shall be reviewed and approved by the NRC prior to implementation. Changes to the Bases implemented without prior NRC approval shall be provided to the NRC on a frequency consistent with 10 CFR 50.71(e).

(continued)

5.0 PROGRAMS (continued)

5.4 Radiation Protection Program

- 5.4.1 The radiation protection program shall appropriately address STC loading and unloading conditions, including transfer of the loaded TRANSFER CASK outside of facilities governed by 10 CFR Part 50. The radiation protection program shall include appropriate controls for direct radiation and contamination, ensuring compliance with applicable regulations, and implementing actions to maintain personnel occupational exposures As Low As Reasonably Achievable (ALARA). The actions and criteria to be included in the program are provided below.
- 5.4.2 Total (neutron plus gamma) measured dose rates shall not exceed the following:
- a. 1400 mrem/hr on the top of the STC (with lid in place).
 - b. 5 mrem/hr on the side of the TRANSFER CASK
- 5.4.3 The STC and TRANSFER CASK surface neutron and gamma dose rates shall be measured as described in Section 5.4.6 for comparison against the limits established in Section 5.4.2.
- 5.4.4 If the measured surface dose rates exceed the limits established in Section 5.4.2, then:
- a. Administratively verify that the correct contents were loaded in the correct fuel basket cell locations.
 - b. Perform a written evaluation to determine whether TRANSFER OPERATIONS can proceed without exceeding the dose limits of 10 CFR 72.104 or 10 CFR 20.1301.
- 5.4.5 If the verification and evaluation performed pursuant to Section 5.4.4 show that the fuel is loaded correctly and the dose rates from the STC and TRANSFER CASK will not cause the dose limits of 10 CFR 72.104 or 10 CFR 20.1301 to be exceeded, TRANSFER OPERATIONS may occur. Otherwise, TRANSFER OPERATIONS shall not occur until appropriate corrective action is taken to ensure the dose limits are not exceeded.
- 5.4.6 STC and TRANSFER CASK surface dose rates shall be measured at approximately the following locations:
- a. The dose rate measurement shall be taken at the approximate center of the STC top lid. Two (2) additional measurements shall be taken on the STC lid approximately 180 degrees apart and 12 to 18 inches from the center of the lid, avoiding the areas around the inlet and outlet ports. The measurements must be taken when the STC is in the HI-TRAC after the steam space is established and prior to HI-TRAC lid installation.

(continued)

5.0 PROGRAMS (continued)

- b. A minimum of four (4) dose rate measurements shall be taken on the side of the TRANSFER CASK approximately at the cask mid-height plane. The measurement locations shall be approximately 90 degrees apart around the circumference of the cask. Dose rates shall be measured between the radial ribs of the water jacket.

ATTACHMENT 3 TO NL-11-130

**Indian Point Unit 3
Appendix C to the Operating License
Inter-Unit Fuel Transfer Technical Specifications**

Entergy Nuclear Operations, Inc.
Indian Point Unit 3
Docket No. 50-286

APPENDIX C
TO
FACILITY OPERATING LICENSE
FOR
ENERGY NUCLEAR INDIAN POINT 3, LLC (ENIP3)
AND
ENERGY NUCLEAR OPERATIONS, INC. (ENO)

INDIAN POINT NUCLEAR
GENERATING UNIT No. 3

INTER-UNIT FUEL TRANSFER TECHNICAL SPECIFICATIONS

PART I: SPENT FUEL TRANSFER CANISTER AND TRANSFER CASK SYSTEM

FACILITY LICENSE NO. DPR-64

DOCKET NO. 50-286

Amendment No.

SPENT FUEL SHIELDED TRANSFER CANISTER AND TRANSFER CASK SYSTEM

1.0 DESCRIPTION

The spent fuel transfer system consists of the following components: (1) a spent fuel shielded transfer canister (STC), which contains the fuel; (2) a transfer cask (HI-TRAC 100D) (hereafter referred to as HI-TRAC), which contains the STC during transfer operations; and (3) a bottom missile shield.

The STC and HI-TRAC are designed to transfer irradiated nuclear fuel assemblies from the INDIAN POINT 2 (IP3) spent fuel pit to the Indian Point 2 (IP2) spent fuel pit. A fuel basket within the STC holds the fuel assemblies and provides criticality control. The shielded transfer canister provides the confinement boundary, water retention boundary, gamma radiation shielding, and heat rejection capability. The HI-TRAC provides a water retention boundary, protection of the STC, gamma and neutron radiation shielding, and heat rejection capability. The STC contains up to 12 fuel assemblies.

The STC is the confinement system for the fuel. It is a welded, multi-layer steel and lead cylinder with a welded base-plate and bolted lid. The inner shell of the canister forms an internal cylindrical cavity for housing the fuel basket. The outer surface of the canister inner shell is buttressed with lead and steel shells for radiation shielding. The minimum thickness of the steel, lead and steel shells relied upon for shielding starting with the innermost shell are $\frac{3}{4}$ inch steel, 2 $\frac{3}{4}$ inch lead and $\frac{3}{4}$ inch steel, respectively. The canister closure incorporates two O-ring seals to ensure its confinement function. The confinement system consists of the canister inner shell, bottom plate, top flange, top lid, top lid O-ring seals, vent port seal and cover plate, and drain port seal and coverplate. The fuel basket, for the transfer of 12 Pressurized Water Reactor (PWR) fuel assemblies, is a fully welded, stainless steel, honeycomb structure with neutron absorber panels attached to the individual storage cell walls under stainless steel sheathing. The maximum gross weight of the fully loaded STC is 40 tons.

The HI-TRAC is a multi-layer steel and lead cylinder with a bolted bottom (or pool) and top lid. For the fuel transfer operation the HI-TRAC is fitted with a solid top lid, an STC centering assembly, and a bottom missile shield. The inner shell of the transfer cask forms an internal cylindrical cavity for housing the STC. The outer surface of the cask inner shell is buttressed with intermediate lead and steel shells for radiation shielding. The minimum thickness of the steel, lead and steel shells relied upon for shielding starting with the innermost shell are $\frac{3}{4}$ inch steel, 2 $\frac{7}{8}$ inch lead and 1 inch steel, respectively. An outside shell called the "water jacket" contains water for neutron shielding, with a minimum thickness of 5". The HI-TRAC bottom and top lids incorporates a gasket seal design to ensure its water confinement function. The water confinement system consists of the HI-TRAC inner shell, bottom lid, top lid, top lid seal, bottom lid seal, vent port seal, vent port cap and bottom drain plug.

The HI-TRAC provides a water retention boundary, protection of the STC, gamma and neutron radiation shielding, and heat rejection capability. The bottom missile shield is attached to the bottom of the HI-TRAC and provides tornado missile protection of the pool lid bolted joint. The HI-TRAC can withstand a tornado missile in other areas without the need for additional shielding. The STC centering assembly provides STC position control within the HI-TRAC and also acts as an internal impact limiter in the event of a non-mechanistic tipover accident.

Facility Operating License
Appendix C – Inter-Unit Fuel Transfer Technical Specifications

2.0 CONDITIONS

2.1 OPERATING PROCEDURES

Written operating procedures shall be prepared for cask handling, loading, movement, surveillance, maintenance, and recovery from off normal conditions such as crane hang-up. The written operating procedures shall be consistent with the technical basis described in Chapter 10 of the Licensing Report (Holtec International Report HI-2094289).

2.2 ACCEPTANCE TESTS AND MAINTENANCE PROGRAM

Written cask acceptance tests and maintenance program shall be prepared consistent with the technical basis described in Chapter 8 of the Licensing Report (Holtec International Report HI-2094289).

2.3 PRE-OPERATIONAL TESTING AND TRAINING EXERCISE

A training exercise of the loading, closure, handling/transfer, and unloading, of the equipment shall be conducted prior to the first transfer. The training exercise shall not be conducted with irradiated fuel. The training exercise may be performed in an alternate step sequence from the actual procedures, but all steps must be performed. The training exercise shall include, but is not limited to the following:

- a) Moving the STC into the IP3 spent fuel pool.
- b) Preparation of the HI-TRAC for STC loading.
- c) Selection and verification of specific fuel assemblies and non-fuel hardware to ensure type conformance.
- d) Loading specific assemblies and placing assemblies into the STC (using a single dummy fuel assembly), including appropriate independent verification.
- e) Remote installation of the STC lid and removal of the STC from the spent fuel pool.
- f) Placement of the STC into the HI-TRAC with the STC centering assembly.
- g) STC closure, establishment of STC water level with steam, verification of STC water level, STC leakage testing, and operational steps required prior to transfer, as applicable.
- h) Establishment and verification of HI-TRAC water level.
- i) Installation of the HI-TRAC top lid.
- j) HI-TRAC closure, leakage testing, and operational steps required prior to transfer, as applicable.
- k) Movement of the HI-TRAC with STC from the IP3 fuel handling building to the IP2 fuel handling building along the haul route with designated devices.
- l) Moving the STC into the IP2 spent fuel pool.
- m) Manual crane operations for bare STC movements including demonstration of recovery from a crane hang-up with the STC suspended from the crane.

APPENDIX C
TO
FACILITY OPERATING LICENSE
FOR
ENERGY NUCLEAR INDIAN POINT 3, LLC (ENIP3)
AND
ENERGY NUCLEAR OPERATIONS, INC. (ENO)

INDIAN POINT NUCLEAR
GENERATING UNIT No. 3

INTER-UNIT FUEL TRANSFER TECHNICAL SPECIFICATIONS

PART II: TECHNICAL SPECIFICATIONS

FACILITY LICENSE NO. DPR-64

DOCKET NO. 50-286

Amendment No.

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1.0 USE AND APPLICATION

1.1 Definitions

-----NOTE-----

The defined terms of this section appear in capitalized type and are applicable throughout these Technical Specifications and Bases.

<u>Term</u>	<u>Definition</u>
ACTIONS	ACTIONS shall be that part of a Specification that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.
INTACT FUEL ASSEMBLIES	INTACT FUEL ASSEMBLIES are fuel assemblies without known or suspected cladding defects greater than pinhole leaks or hairline cracks, and which can be handled by normal means. Fuel assemblies without fuel rods in fuel rod locations shall not be classified as INTACT FUEL ASSEMBLIES unless dummy fuel rods are used to displace an amount of water greater than or equal to that displaced by the original fuel rod(s).
LOADING OPERATIONS	LOADING OPERATIONS include all licensed activities on an STC while it is being loaded with fuel assemblies and while the STC is being placed in the HI-TRAC. LOADING OPERATIONS begin when the first fuel assembly is placed in the STC and end when the HI-TRAC is suspended from or secured on the TRANSPORTER.
NON-FUEL HARDWARE (NFH)	NFH is defined as Burnable Poison Rod Assemblies (BPRAs), Thimble Plug Devices (TPDs), Wet Annular Burnable Absorbers (WABAs), Rod Cluster Control Assemblies (RCCAs), Neutron Source Assemblies (NSAs), Hafnium Flux Suppressors, and Instrument Tube Tie Rods (ITTRs).
TRANSFER OPERATIONS	TRANSFER OPERATIONS include all licensed activities performed on a HI-TRAC loaded with one or more fuel assemblies when it is being moved after LOADING OPERATIONS or before UNLOADING OPERATIONS. TRANSFER OPERATIONS begin when the HI-TRAC is first suspended from or secured on the transporter and end when the TRANSPORTER is at its destination and the HI-TRAC is no longer secured on or suspended from the transporter.
TRANSPORTER	TRANSPORTER is the device or vehicle which moves the HI-TRAC. The TRANSPORTER can either support the HI-TRAC from underneath or the HI-TRAC can be suspended from it.

(continued)

1.1 Definitions (continued)

<u>Term</u>	<u>Definition</u>
UNLOADING OPERATIONS	UNLOADING OPERATIONS include all licensed activities on an STC or HI-TRAC while it is being unloaded of the contained fuel assemblies. UNLOADING OPERATIONS begin when the HI-TRAC is no longer suspended from or secured on the TRANSPORTER and end when the last fuel assembly is removed from the STC.
ZR	ZR means any zirconium-based fuel cladding authorized for use in a commercial nuclear power plant reactor.

1.0 USE AND APPLICATION

1.2 Logical Connectors

PURPOSE

The purpose of this section is to explain the meaning of logical connectors.

Logical connectors are used in Technical Specifications (TS) to discriminate between, and yet connect, discrete Conditions, Required Actions, Completion Times, Surveillances, and Frequencies. The only logical connectors that appear in TS are AND and OR. The physical arrangement of these connectors constitutes logical conventions with specific meanings.

BACKGROUND

Several levels of logic may be used to state Required Actions. These levels are identified by the placement (or nesting) of the logical connectors and by the number assigned to each Required Action. The first level of logic is identified by the first digit of the number assigned to a Required Action and the placement of the logical connector in the first level of nesting (i.e., left justified with the number of the Required Action). The successive levels of logic are identified by additional digits of the Required Action number and by successive indentions of the logical connectors.

When logical connectors are used to state a Condition, Completion Time, Surveillance, or Frequency, only the first level of logic is used, and the logical connector is left justified with the statement of the Condition, Completion Time, Surveillance, or Frequency.

(continued)

1.2 Logical Connectors (continued)

EXAMPLES

The following examples illustrate the use of logical connectors.

EXAMPLE 1.2-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 VERIFY ... <u>AND</u> A.2 Restore ...	

In this example the logical connector AND is used to indicate that when in Condition A, both Required Actions A.1 and A.2 must be completed.

(continued)

1.2 Logical Connectors (continued)

EXAMPLES
(continued)

EXAMPLE 1.2-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Stop . . . <u>OR</u> A.2.1 Verify . . . <u>AND</u> A.2.2.1 Reduce . . . <u>OR</u> A.2.2.2 Perform . . . <u>OR</u> A.3 Remove . . .	

This example represents a more complicated use of logical connectors. Required Actions A.1, A.2, and A.3 are alternative choices, only one of which must be performed as indicated by the use of the logical connector OR and the left justified placement. Any one of these three ACTIONS may be chosen. If A.2 is chosen, then both A.2.1 and A.2.2 must be performed as indicated by the logical connector AND. Required Action A.2.2 is met by performing A.2.2.1 or A.2.2.2. The indented position of the logical connector OR indicates that A.2.2.1 and A.2.2.2 are alternative choices, only one of which must be performed.

1.0 USE AND APPLICATION

1.3 Completion Times

PURPOSE	The purpose of this section is to establish the Completion Time convention and to provide guidance for its use.
BACKGROUND	Limiting Conditions for Operation (LCOs) specify the lowest functional capability or performance levels of equipment required for safe operation of the facility. The ACTIONS associated with an LCO state Conditions that typically describe the ways in which the requirements of the LCO can fail to be met. Specified with each stated Condition are Required Action(s) and Completion Times(s).
DESCRIPTION	<p>The Completion Time is the amount of time allowed for completing a Required Action. It is referenced to the time of discovery of a situation (e.g., equipment or variable not within limits) that requires entering an ACTIONS Condition unless otherwise specified, providing the Spent Fuel Shielded Transfer Canister and Transfer Cask System is in a specified condition stated in the Applicability of the LCO. Required Actions must be completed prior to the expiration of the specified Completion Time. An ACTIONS Condition remains in effect and the Required Actions apply until the Condition no longer exists or the Spent Fuel Shielded Transfer Canister and Transfer Cask System is not within the LCO Applicability.</p> <p>Once a Condition has been entered, subsequent subsystems, components, or variables expressed in the Condition, discovered to be not within limits, will <u>not</u> result in separate entry into the Condition unless specifically stated. The Required Actions of the Condition continue to apply to each additional failure, with Completion Times based on initial entry into the Condition.</p>

(continued)

1.3 Completion Times (continued)

EXAMPLES

The following examples illustrate the use of Completion Times with different types of Conditions and changing Conditions.

EXAMPLE 1.3-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Perform Action B.1	12 hours
	<u>AND</u> B.2 Perform Action B.2	36 hours

Condition B has two Required Actions. Each Required Action has its own separate Completion Time. Each Completion Time is referenced to the time that Condition B is entered.

The Required Actions of Condition B are to complete action B.1 within 12 hours AND complete action B.2 within 36 hours. A total of 12 hours is allowed for completing action B.1 and a total of 36 hours (not 48 hours) is allowed for completing action B.2 from the time that Condition B was entered. If action B.1 is completed within 6 hours, the time allowed for completing action B.2 is the next 30 hours because the total time allowed for completing action B.2 is 36 hours.

(continued)

1.3 Completion Times (continued)

EXAMPLES
(continued)

EXAMPLE 1.3-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One system not within limit.	A.1 Restore system to within limit.	7 days
B. Required Action and associated Completion Time not met.	B.1 Complete action B.1.	12 hours
	<u>AND</u> B.2 Complete action B.2.	36 hours

When a system is determined not to meet the LCO, Condition A is entered. If the system is not restored within 7 days, Condition B is also entered and the Completion Time clocks for Required Actions B.1 and B.2 start. If the system is restored after Condition B is entered, Conditions A and B are exited, and therefore, the Required Actions of Condition B may be terminated.

(continued)

1.3 Completion Times (continued)

EXAMPLES
(continued)

EXAMPLE 1.3-3

ACTIONS

-----NOTE-----

Separate Condition entry is allowed for each component.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Restore compliance with LCO.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Complete action B.1.	6 hours
	<u>AND</u> B.2 Complete action B.2.	12 hours

The Note above the ACTIONS table is a method of modifying how the Completion Time is tracked. If this method of modifying how the Completion Time is tracked was applicable only to a specific Condition, the Note would appear in that Condition rather than at the top of the ACTIONS Table.

The Note allows Condition A to be entered separately for each component, and Completion Times tracked on a per component basis. When a component is determined to not meet the LCO, Condition A is entered and its Completion Time starts. If subsequent components are determined to not meet the LCO, Condition A is entered for each component and separate Completion Times start and are tracked for each component.

IMMEDIATE
COMPLETION
TIME

When "Immediately" is used as a Completion Time, the Required Action should be pursued without delay and in a controlled manner.

1.0 USE AND APPLICATION

1.4 Frequency

PURPOSE	The purpose of this section is to define the proper use and application of Frequency requirements.
DESCRIPTION	<p>Each Surveillance Requirement (SR) has a specified Frequency in which the Surveillance must be met in order to meet the associated Limiting Condition for Operation (LCO). An understanding of the correct application of the specified Frequency is necessary for compliance with the SR.</p> <p>The "specified Frequency" is referred to throughout this section and each of the Specifications of Section 3.0, Surveillance Requirement (SR) Applicability. The "specified Frequency" consists of the requirements of the Frequency column of each SR.</p> <p>Situations where a Surveillance could be required (i.e., its Frequency could expire), but where it is not possible or not desired that it be performed until sometime after the associated LCO is within its Applicability, represent potential SR 3.0.4 conflicts. To avoid these conflicts, the SR (i.e., the Surveillance or the Frequency) is stated such that it is only "required" when it can be and should be performed. With an SR satisfied, SR 3.0.4 imposes no restriction.</p>

(continued)

1.4 Frequency (continued)

EXAMPLES

The following examples illustrate the various ways that Frequencies are specified.

EXAMPLE 1.4-1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Verify pressure within limit	12 hours

Example 1.4-1 contains the type of SR most often encountered in the Technical Specifications (TS). The Frequency specifies an interval (12 hours) during which the associated Surveillance must be performed at least one time. Performance of the Surveillance initiates the subsequent interval. Although the Frequency is stated as 12 hours, an extension of the time interval to 1.25 times the interval specified in the Frequency is allowed by SR 3.0.2 for operational flexibility. The measurement of this interval continues at all times, even when the SR is not required to be met per SR 3.0.1 (such as when the equipment or variables are outside specified limits, or the facility is outside the Applicability of the LCO). If the interval specified by SR 3.0.2 is exceeded while the facility is in a condition specified in the Applicability of the LCO, the LCO is not met in accordance with SR 3.0.1.

If the interval as specified by SR 3.0.2 is exceeded while the facility is not in a condition specified in the Applicability of the LCO for which performance of the SR is required, the Surveillance must be performed within the Frequency requirements of SR 3.0.2 prior to entry into the specified condition. Failure to do so would result in a violation of SR 3.0.4.

(continued)

1.4 Frequency (continued)

EXAMPLES
(continued)

EXAMPLE 1.4-2

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Verify flow is within limits.	Once within 12 hours prior to starting activity <u>AND</u> 24 hours thereafter

Example 1.4-2 has two Frequencies. The first is a one time performance Frequency, and the second is of the type shown in Example 1.4-1. The logical connector "AND" indicates that both Frequency requirements must be met. Each time the example activity is to be performed, the Surveillance must be performed within 12 hours prior to starting the activity.

The use of "once" indicates a single performance will satisfy the specified Frequency (assuming no other Frequencies are connected by "AND"). This type of Frequency does not qualify for the 25% extension allowed by SR 3.0.2.

"Thereafter" indicates future performances must be established per SR 3.0.2, but only after a specified condition is first met (i.e., the "once" performance in this example). If the specified activity is canceled or not performed, the measurement of both intervals stops. New intervals start upon preparing to restart the specified activity.

2.0 NOT USED

This section is intentionally left blank

3.0 LIMITING CONDITIONS FOR OPERATION (LCO) APPLICABILITY

LCO 3.0.1	LCOs shall be met during specified conditions in the Applicability, except as provided in LCO 3.0.2.
LCO 3.0.2	<p>Upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met, except as provided in LCO 3.0.5.</p> <p>If the LCO is met or is no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required, unless otherwise stated.</p>
LCO 3.0.3	Not applicable.
LCO 3.0.4	When an LCO is not met, entry into a specified condition in the Applicability shall not be made except when the associated ACTIONS to be entered permit continued operation in the specified condition in the Applicability for an unlimited period of time. This Specification shall not prevent changes in specified conditions in the Applicability that are required to comply with ACTIONS or that are related to the unloading of an STC.
LCO 3.0.5	Equipment removed from service or not in service in compliance with ACTIONS may be returned to service under administrative control solely to perform testing required to demonstrate it meets the LCO or that other equipment meets the LCO. This is an exception to LCO 3.0.2 for the system returned to service under administrative control to perform the testing.

3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY

SR 3.0.1 SRs shall be met during the specified conditions in the Applicability for individual LCOs, unless otherwise stated in the SR. Failure to meet a Surveillance, whether such failure is experienced during the performance of the Surveillance or between performances of the Surveillance, shall be failure to meet the LCO. Failure to perform a Surveillance within the specified Frequency shall be failure to meet the LCO except as provided in SR 3.0.3. Surveillances do not have to be performed on equipment or variables outside specified limits.

SR 3.0.2 The specified Frequency for each SR is met if the Surveillance is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met.

For Frequencies specified as “once,” the above interval extension does not apply. If a Completion Time requires periodic performance on a “once per...” basis, the above Frequency extension applies to each performance after the initial performance.

Exceptions to this Specification are stated in the individual Specifications.

SR 3.0.3 If it is discovered that a Surveillance was not performed within its specified Frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Frequency, whichever is less. This delay period is permitted to allow performance of the Surveillance.

If the Surveillance is not performed within the delay period, the LCO must immediately be declared not met, and the applicable Condition(s) must be entered.

When the Surveillance is performed within the delay period and the Surveillance is not met, the LCO must immediately be declared not met, and the applicable Condition(s) must be entered.

SR 3.0.4 Entry into a specified condition in the Applicability of an LCO shall not be made unless the LCO's Surveillances have been met within their specified Frequency. This provision shall not prevent entry into specified conditions in the Applicability that are required to comply with Actions or that are related to the unloading of an STC.

3.1 INTER-UNIT FUEL TRANSFER

3.1.1 Boron Concentration

LCO 3.1.1 The boron concentration of the water in the Spent Fuel Pit and the STC shall be ≥ 2000 ppm.

APPLICABILITY: Whenever one or more fuel assemblies are in the STC.

-----NOTE-----
Only applicable to the spent fuel pit when the STC is in the spent fuel pit

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Boron concentration not within limit.	A.1 Suspend LOADING OPERATIONS or UNLOADING OPERATIONS.	Immediately
	<u>AND</u>	
	A.2 Suspend positive reactivity additions.	Immediately
	<u>AND</u>	
	A.3 Initiate action to restore boron concentration to within limit.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
-----NOTE----- This surveillance is only required to be performed if the STC is submerged in water in the spent fuel pool or if water is added to, or recirculated through, the STC when the STC is in the HI-TRAC. Any added water must meet the boron concentration requirement of LCO 3.1.1. -----	Once, within 4 hours prior to entering the Applicability of this LCO.
	<u>AND</u>
SR 3.1.1.1 Verify the boron concentration is within limit using two separate measurements.	Once per 48 hours thereafter.

3.1 INTER-UNIT FUEL TRANSFER

3.1.2 Shielded Transfer Canister (STC) Loading

LCO 3.1.2 INTACT FUEL ASSEMBLIES placed into the Shielded Transfer Canister (STC) shall be classified in accordance with Table 3.1.2-1 based on initial enrichment and burnup and shall be restricted based on the following:

- a. INTACT FUEL ASSEMBLIES classified as Type 2 may be placed in any location of the STC basket (see Figure 3.1.2-1) with the following restrictions:
 1. Post-irradiation cooling time, initial enrichment, and allowable average burnup shall be within the limits for the cell locations as specified in Table 3.1.2-3;
 2. Decay heat including NON FUEL HARDWARE \leq 650 Watts (any cell);
 3. Decay heat including NON FUEL HARDWARE \leq 1105 Watts (cell 1, 2, 3 or 4);
 4. Post-irradiation cooling time and the maximum average burnup of NON FUEL HARDWARE shall be within the cell locations and limits specified in Table 3.1.2-2. In accordance with Table 3.1.2-2 RCCAs, NSAs, and Hafnium Flux Suppressors cannot be placed in locations 5, 6, 7, 8, 9, 10, 11, 12 of the STC basket.

- NOTE -

If one or more Type 1 fuel assemblies are in the STC, cells 1, 2, 3, AND 4 must be empty, with a cell blocker installed that prevents inserting fuel assemblies and/or NON-FUEL HARDWARE.

- b. INTACT FUEL ASSEMBLIES classified as Type 1 or Type 2 may be placed in locations 5, 6, 7, 8, 9, 10, 11, 12 of the STC basket (see Figure 3.1.2-1) with the following restrictions:
 1. Post-irradiation cooling time, initial enrichment, and allowable average burnup shall be within the limits for the cell locations as specified in Table 3.1.2-3;
 2. Decay heat including NON FUEL HARDWARE \leq 650 Watts;
 3. Post-irradiation cooling time and the maximum average burnup of NON FUEL HARDWARE shall be within the cell locations and limits specified in Table 3.1.2-2. In accordance with Table 3.1.2-2 RCCAs, NSAs, and Hafnium Flux Suppressors cannot be placed in locations 5, 6, 7, 8, 9, 10, 11, 12 of the STC basket.

APPLICABILITY: Whenever one or more fuel assemblies are in the STC.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One or more fuel assemblies in the STC do not meet the LCO limits.</p>	<p>A.1.1 Initiate action to restore compliance with LCO 3.1.2.</p> <p><u>OR</u></p> <p>A.1.2 Initiate action to move fuel to the IP3 spent fuel pit in accordance with IP3 Appendix A Technical Specification LCO 3.7.16.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.1.2.1 Verify by administrative means that the fuel assembly meets the requirements specified in the LCO for placement in the STC.</p>	<p>Prior to placing the fuel assembly in the STC.</p>
<p>SR 3.1.2.2 Verify by visual inspection that a cell blocker which prevents inserting fuel assemblies and/or NON-FUEL HARDWARE into cells 1, 2, 3, and 4 of the STC is installed.</p>	<p>Prior to placing a Type 1 fuel assembly in the STC.</p>

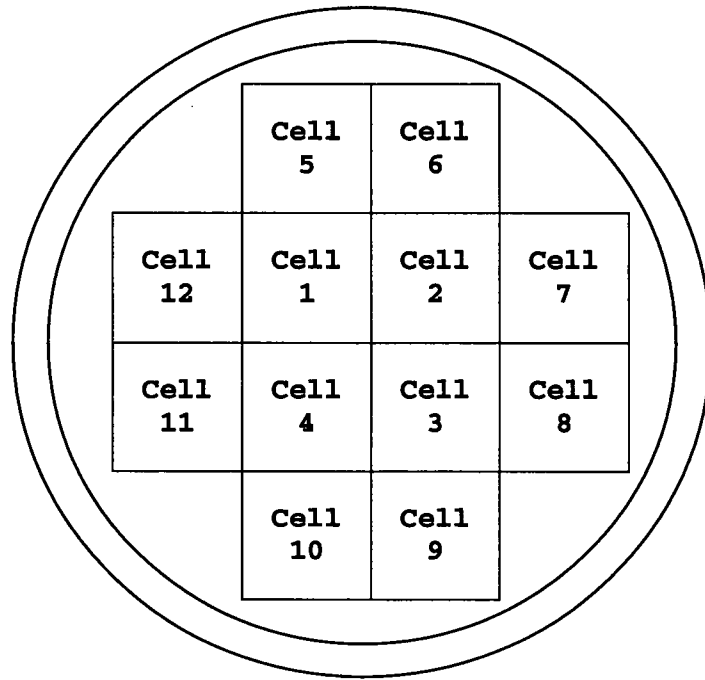


Figure 3.1.2-1
Shielded Transfer Canister Layout
(Top View)

Table 3.1.2-1
Minimum Burnup Requirements at Varying Initial Enrichments^(a)

Maximum Assembly Initial Enrichment ^{(f)(g)} (wt% U235)	Configuration A ^(c) Minimum Assembly Average Burnup (MWD/MTU) ^(b)	Configuration B ^(d) Minimum Assembly Average Burnup (MWD/MTU) ^(b)
2.0	5,400	6,000
2.5	13,800	18,800
3.0	22,100	28,600
3.5	30,000	37,300
4.0	36,900	44,600
4.5	42,700	52,500
5.0	48,700	Note (e)

- (a) Fuel that does not meet the minimum assembly average burnup at a given initial enrichment is classified as Type 1 fuel. Fuel that meets the minimum assembly average burnup at a given initial enrichment is classified as Type 2 fuel.
- (b) Linear interpolation between enrichment levels to determine minimum burnup requirements is permitted.
- (c) Assemblies that have not been located in any cycle under a control rod bank that was permitted to be inserted during full power operation or where it can be shown that the insertion did not exceed 8 inches below the top of the active fuel.
- (d) Assemblies that have been located under a control rod bank that was permitted to be inserted during full power operation and where the insertion was more than 8 inches below the top of the active fuel. This configuration also applies to fuel assemblies that have contained a Hafnium Flux Suppressor.
- (e) Configuration B assemblies with enrichment greater than 4.5 are classified as Type 1 fuel.
- (f) Natural or enriched uranium blankets are not considered in determining the fuel assembly average enrichment for comparison to the minimum allowed initial average enrichment.
- (g) Rounding to one decimal place to determine initial enrichment is not permitted.

Table 3.1.2-2

NON FUEL HARDWARE^(a) Post Irradiation Cooling Times and Allowable Average Burnup

Post-irradiation Cooling Time (years)	Maximum Burnup (MWD/MTU)				
	BPRAs and WABAs ^(b)	TPDs ^{(b)(c)}	RCCAs	Hafnium Flux Suppressors	NSAs ^(c)
≥ 6	≤ 20000	N/A	≤ 630000	≤ 20000	N/A
≥ 7	-	≤ 20000	-	-	N/A
≥ 8	≤ 30000	-	-	≤ 30000	N/A
≥ 9	≤ 40000	≤ 30000	-	-	N/A
≥ 10	≤ 50000	≤ 40000	-	-	N/A
≥ 11	≤ 60000	≤ 45000	-	-	N/A
≥ 12	-	≤ 50000	-	-	N/A
≥ 13	-	≤ 60000	-	-	N/A
≥ 14	-	-	-	-	N/A
≥ 15	-	≤ 90000	-	-	N/A
≥ 16	-	≤ 630000	-	-	N/A
≥ 20	-	-	-	-	≤ 360000
Allowed Quantity and Location	Up to twelve (12) per transfer in any location	Up to twelve (12) per transfer in any location	Up to four (4) per transfer in Cells 1, 2, 3, and/or 4	Up to four (4) per transfer in Cells 1, 2, 3, and/or 4	One per transfer in Cell 1, 2, 3, or 4

- (a) NON-FUEL HARDWARE burnup and cooling time limits are not applicable to Instrument Tube Tie Rods (ITTRs), since they are installed post-irradiation.
- (b) Linear interpolation between points is only permitted for BPRAs, WABAs, and TPDs, with the exception that interpolation is not permitted for TPDs with burnups greater than 90 GWd/MTU and cooling times greater than 15 years.
- (c) N/A means not authorized for loading at this cooling time.

Table 3.1.2-3
Allowable STC Loading Configurations

Configuration ^(c)	Cells 1, 2, 3, 4 ^{(a)(b)}	Cells 5, 6, 7, 8, 9, 10, 11, 12 ^{(a)(b)}
1	Burnup ≤ 55,000 MWD/MTU Cooling time ≥ 10 years Initial Enrichment ≥ 3.4 wt% U-235	Burnup ≤ 40,000 MWD/MTU Cooling time ≥ 25 years Initial Enrichment ≥ 2.3 wt% U-235
2	Burnup ≤ 45,000 MWD/MTU Cooling time ≥ 10 years Initial Enrichment ≥ 3.2 wt% U-235	Burnup ≤ 45,000 MWD/MTU Cooling time ≥ 20 years Initial Enrichment ≥ 3.2 wt% U-235
3	Burnup ≤ 55,000 MWD/MTU Cooling time ≥ 10 years Initial Enrichment ≥ 3.4 wt% U-235	Burnup ≤ 45,000 MWD/MTU Cooling time ≥ 20 years Initial Enrichment ≥ 3.2 wt% U-235
4	Burnup ≤ 45,000 MWD/MTU Cooling time ≥ 10 years Initial Enrichment ≥ 3.6 wt% U-235	Burnup ≤ 40,000 MWD/MTU Cooling time ≥ 12 years Initial Enrichment ≥ 3.2 wt% U-235
5	Burnup ≤ 45,000 MWD/MTU Cooling time ≥ 14 years Initial Enrichment ≥ 3.4 wt% U-235	Burnup ≤ 40,000 MWD/MTU Cooling time ≥ 12 years Initial Enrichment ≥ 3.2 wt% U-235
6	Burnup ≤ 45,000 MWD/MTU Cooling time ≥ 20 years Initial Enrichment ≥ 3.2 wt% U-235	Burnup ≤ 40,000 MWD/MTU Cooling time ≥ 20 years Initial Enrichment ≥ 2.3 wt% U-235

- (a) Initial enrichment is the assembly average enrichment. Natural or enriched uranium blankets are not considered in determining the fuel assembly average enrichment for comparison to the minimum allowed initial average enrichment.
- (b) Rounding to one decimal place to determine initial enrichment is permitted.
- (c) Fuel with five middle Inconel spacers are limited to cells 1, 2, 3, and 4 for all loading configurations except loading configuration 6 which allows fuel with Inconel spacers in all cells.

3.1 INTER-UNIT FUEL TRANSFER

3.1.3 Shielded Transfer Canister (STC) Initial Water Level

LCO 3.1.3 The established water level in the STC shall be 9.0+0.5/-1.5 inches below the bottom of the STC lid.

APPLICABILITY: Prior to TRANSFER OPERATIONS when the STC is in the HI-TRAC and the STC lid has been installed.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. STC water level not within limit.	<p style="text-align: center;">-----NOTE-----</p> <p style="text-align: center;">Water used for level restoration must meet the boron concentration requirement of LCO 3.1.1.</p> <p style="text-align: center;">-----</p> <p>A.1 Initiate action to restore STC water level.</p>	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.1.3.1 Verify the initial STC water level is within limit by verifying the following during STC water level establishment:</p> <p style="margin-left: 20px;">a. steam is emitted from the STC drain tube; and</p> <p style="margin-left: 20px;">b. the volume of water removed is \geq 35.4 gallons and \leq 47.9 gallons.</p>	Once prior to TRANSFER OPERATIONS.

3.1 INTER-UNIT FUEL TRANSFER

3.1.4 Shielded Transfer Canister (STC) Pressure Rise

LCO 3.1.4 The pressure rise in the STC cavity shall be ≤ 0.2 psi/hr averaged over a rolling 4 hour period.

APPLICABILITY: Over a 24 hour period after successful completion of LCO 3.1.3 and prior to TRANSFER OPERATIONS when the STC is in the HI-TRAC and the STC lid has been installed.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. Rate of STC cavity pressure rise not within limit.</p>	<p>A.1.1 Establish a vent path on the STC.</p> <p><u>AND</u></p> <p>-----NOTE-----</p> <p>Water used for recirculation must meet the boron concentration requirement of LCO 3.1.1.</p> <p>-----</p> <p>A.1.2 Begin circulation of borated water in the STC to establish and maintain the STC water exit temperature $< 180^{\circ}\text{F}$.</p> <p><u>AND</u></p> <p>A.1.3 Begin actions to determine the reason for exceeding the pressure rise limit.</p>	<p>Immediately</p> <p>(continued)</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action A.1.3 indicates a fuel misload.	B.1.1 Return the STC to the spent fuel pool and remove the STC lid. AND	12 hours
	B.1.2 Return any misloaded fuel to the IP3 spent fuel pit in accordance with IP3 Appendix A Technical Specification LCO 3.7.16.	24 hours
C. Required Action A.1.3 does not indicate a fuel misload.	C.1 Develop and initiate corrective actions necessary to return the STC to compliance with LCO 3.1.3 and LCO 3.1.4.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.1.4.1 -----NOTE-----</p> <p>Pressure measurements shall be taken once upon establishing required water level AND hourly thereafter for 24 hours. Pressure may initially drop during pressure stabilization.</p> <p>-----</p> <p>Verify by direct measurement that the rate of STC cavity pressure rise is within limit.</p>	Once prior to TRANSFER OPERATIONS.
SR 3.1.4.2 Verify that an ASME code compliant pressure relief valve or rupture disc and two channels of pressure instrumentation with a range of at least 0.1 psia to 15 psia and calibrated to within 1% accuracy within the past 12 months are installed on the STC.	During performance of SR 3.1.4.1.

3.1 INTER-UNIT FUEL TRANSFER

3.1.5 Shielded Transfer Canister (STC) Unloading

-----NOTE-----

1. Only IP3 spent fuel assemblies are permitted to be in the STC.
 2. Once each IP3 spent fuel assembly removed from the STC has been placed in an IP2 spent fuel rack location and disconnected from the spent fuel pit bridge crane, it may not be returned to the STC.
 3. For fuel assemblies exposed to Hafnium Flux Suppressors during irradiation the burnup of the assembly used to classify the fuel for unloading into the IP2 spent fuel pit shall be the burnup prior to the exposure to the Hafnium Flux Suppressor.
-

LCO 3.1.5 IP3 spent fuel assemblies transferred to IP2 via the STC must be either in an approved IP2 spent fuel pit storage rack location per IP2 Appendix A Technical Specification LCO 3.7.13, in their authorized STC fuel basket cell, or be in transit between these two locations.

APPLICABILITY: Whenever the STC is in the Unit 2 spent fuel pit.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more fuel assemblies not in the required location.	A.1 Initiate action to restore compliance with LCO 3.1.5	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.5.1 Verify by administrative means that a fuel assembly returned to the STC has been re-loaded into the same STC cell from which it was removed.	Once, after each re-loaded fuel assembly is returned to the STC.

4.0 DESIGN FEATURES

4.1 Inter-Unit Fuel Transfer

4.1.1 Fuel Assemblies

Fuel assemblies selected for inter-unit transfer of fuel shall meet the fuel characteristics specified in Table 4.1.1-1.

4.1.2 Criticality

4.1.2.1 The Shielded Transfer Canister (STC) is designed and shall be maintained with:

- a. Fuel assemblies having a maximum U-235 enrichment of 5.0 weight percent;
- b. $k_{\text{eff}} \leq 0.95$ if fully flooded with unborated water;
- c. A nominal 9.218 inch center-to-center distance between fuel assemblies placed in the STC basket;
- d. Basket cell ID: 8.79 in. (nominal);
- e. Basket cell wall thickness: 0.28 in. (nominal);
- f. B_4C in the Metamic neutron absorber: ≥ 31.5 wt.% and ≤ 33.0 wt.%;
- g. The B_4C in the Metamic neutron absorber will contain boron with an isotopic B-10 content of at least 18.4%;
- h. Metamic panel thickness: ≥ 0.102 in.;
- i. The size and location of the neutron absorber panels shall be in accordance with drawing 6015 of the Licensing Report (Holtec International Report HI-2094289).

4.1.2.2 Drainage

The STC is designed and shall be maintained to prevent inadvertent draining.

4.1.2.3 Capacity

The STC is designed and shall be maintained with a capacity of no more than 12 fuel assemblies.

(continued)

4.0 DESIGN FEATURES (continued)

4.1.3 Codes and Standards

The American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), 2004 Edition, is the governing Code for the STC, as clarified below, except for Code Sections V and IX. The latest effective editions of ASME Code Sections V and IX, including addenda, may be used for activities governed by those sections, provided a written reconciliation of the later edition against the 2004 Edition, is performed. Table 4.1.3-1 lists approved alternatives to the ASME Code for the design of the STC.

4.1.4 Geometric Arrangements and Process Variables

The following are geometric arrangements and process variables that require a one time verification as part of each inter-unit fuel transfer operation:

1. **LOADING OPERATIONS, TRANSFER OPERATIONS, and UNLOADING OPERATIONS** shall only be conducted with working area ambient temperatures $\geq 0^{\circ}\text{F}$.
2. **LOADING OPERATIONS** shall only be conducted when the spent fuel pit water temperature and the fuel handling building ambient temperatures are both $\leq 100^{\circ}\text{F}$.
3. **LOADING OPERATIONS** shall only be conducted when the IP3 spent fuel pit contains no unirradiated fuel assemblies.
4. **LOADING OPERATIONS** shall only be conducted when the irradiated fuel assemblies in the IP3 spent fuel pit have been subcritical for at least 90 days.
5. **TRANSFER OPERATIONS** shall only be conducted when the outside air temperature is $\leq 100^{\circ}\text{F}$.
6. **TRANSFER OPERATIONS** shall only be conducted when the STC trunnions are offset from the HI-TRAC trunnions in the azimuthal direction by at least 30 degrees.
7. **TRANSFER OPERATIONS** shall only be conducted after STC seal leak tests have demonstrated no detected leakage when tested to a sensitivity of 1×10^{-3} ref-cm³/s in accordance with the "pre-shipment" test requirements of ANSI N14.5.
8. Prior to installing the HI-TRAC lid the HI-TRAC water level shall be verified by two separate inspections to be within $+0/-1$ inch of the top of the STC lid.

(continued)

4.0 DESIGN FEATURES (continued)

9. TRANSFER OPERATIONS shall only be conducted after the combined leak rate through the HI-TRAC top lid and vent port cover seals are confirmed to be water tight using an acceptable leak test from ANSI N14.5 and the pool lid seal is verified to be water tight by visual inspection.
10. TRANSFER OPERATIONS shall not occur with a TRANSPORTER that contains > 50 gallons of diesel fuel.

Table 4.1.1-1
Fuel Assembly Characteristics

Fuel Assembly Class	15x15 ^(a)
No. of Fuel Rod Locations	204
Cladding Type	ZR
Guide/Instrument Tube Type	ZR
Design Initial U (kg/assembly)	≤ 473
Fuel Rod Clad O.D. (in)	≥ 0. 422
Fuel Rod Clad I.D. (in)	≤ 0. 3734
Fuel Pellet Diameter (in)	≤ 0. 3659
Fuel Rod Pitch (in)	≤ 0.563
Active Fuel Length (in)	≤ 144
Fuel Assembly Length (in)	≤ 160
Fuel Assembly Width (in)	≤ 8.54
No. of Guide and/or Instrument Tubes	21
Guide/Instrument Tube Thickness (in)	≥ 0. 017
Axial Blanket Enrichment (wt % U-235) ^(b)	≤ 3.2
Axial Blanket Length (in) ^(b)	≥ 6

(a) All dimensions are design nominal values. Maximum and minimum dimensions are specified to bound variations in design nominal values among fuel assemblies within the 15x15 class.

(b) Applicable only if axial blankets are present.

(continued)

4.0 DESIGN FEATURES (continued)

Table 4.1.3-1 (page 1 of 2)

List of ASME Code Alternatives for the STC

Component	Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
STC Confinement Boundary	ND-1000	Statement of requirements for Code stamping of components.	Cask confinement boundary is designed, and will be fabricated in accordance with ASME Code, Section III, Subsection ND to the maximum practical extent, but Code stamping is not required.
STC Confinement Boundary	ND-2000	Requires materials to be supplied by ASME-approved material supplier.	Holtec approved suppliers will supply materials with CMTRs per ND-2000.
STC and STC basket assembly	ND-3100 NG-3100	Provides requirements for determining design loading conditions, such as pressure, temperature, and mechanical loads.	These requirements are not applicable. The Licensing Report, serving as the Design Specification, establishes the service conditions and load combinations for fuel transfer.
STC Confinement Boundary	ND-7000	Vessels are required to have overpressure protection.	No overpressure protection is provided. Function of cask vessel is as a radionuclide confinement boundary under normal and hypothetical accident conditions. Cask is designed to withstand maximum internal pressure and maximum accident temperatures.
STC Confinement Boundary	ND-8000	States requirement for name, stamping and reports per NCA-8000	STC to be marked and identified in accordance with drawing 6013 ^(a) . Code stamping is not required. QA data package prepared in accordance with Holtec's approved QA program.

4.0 DESIGN FEATURES (continued)

Table 4.1.3-1 (page 2 of 2)

List of ASME Code Alternatives for the STC

Component	Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
STC Basket Assembly	NG-4420	NG-4427(a) requires a fillet weld in any single continuous weld may be less than the specified fillet weld dimension by not more than 1/16 inch, provided that the total undersize portion of the weld does not exceed 10 percent of the length of the weld. Individual undersize weld portions shall not exceed 2 inches in length.	<p>Modify the Code requirement (intended for core support structures) with the following text prepared to accord with the geometry and stress analysis imperatives for the fuel basket: For the longitudinal STC basket fillet welds, the following criteria apply: 1) The specified fillet weld throat dimension must be maintained over at least 92 percent of the total weld length. All regions of undersized weld must be less than 3 inches long and separated from each other by at least 9 inches. 2) Areas of undercuts and porosity beyond that allowed by the applicable ASME Code shall not exceed 1/2 inch in weld length. The total length of undercut and porosity over any 1-foot length shall not exceed 2 inches. 3) The total weld length in which items (1) and (2) apply shall not exceed a total of 10 percent of the overall weld length. The limited access of the STC basket panel longitudinal fillet welds makes it difficult to perform effective repairs of these welds and creates the potential for causing additional damage to the basket assembly (e.g., to the neutron absorber and its sheathing) if repairs are attempted. The acceptance criteria provided in the foregoing have been established to comport with the objectives of the basket design and preserve the margins demonstrated in the supporting stress analysis.</p> <p>From the structural standpoint, the weld acceptance criteria are established to ensure that any departure from the ideal, continuous fillet weld seam would not alter the primary bending stresses on which the design of the fuel baskets is predicated. Stated differently, the permitted weld discontinuities are limited in size to ensure that they remain classifiable as local stress elevators ("peak stress", F, in the ASME Code for which specific stress intensity limits do not apply).</p>
STC Basket Assembly	NG-8000	States requirements for nameplates, stamping and reports per NCA-8000.	STC basket to be marked and identified in accordance with drawing 6015 ^(a) . No Code stamping is required. The STC basket data package is to be in conformance with Holtec's QA program.

(a) Holtec International Report HI-2094289

5.0 PROGRAMS

The following programs shall be established, implemented and maintained.

5.1 Transport Evaluation Program

- a. For lifting of the loaded STC or loaded HI-TRAC using equipment which is integral to a structure governed by 10 CFR Part 50 regulations, 10 CFR 50 requirements apply.
- b. This program is not applicable when the loaded HI-TRAC is in the fuel building or is being handled by equipment providing support from underneath (e.g., on air pads).
- c. The loaded HI-TRAC may be lifted to any height necessary during TRANSFER OPERATIONS provided the lifting equipment is designed in accordance with items 1, 2, and 3 below.
 1. The metal body and any vertical columns of the lifting equipment shall be designed to comply with stress limits of ASME Section III, Subsection NF, Class 3 for linear structures. All vertical compression loaded primary members shall satisfy the buckling criteria of ASME Section III, Subsection NF.
 2. The horizontal cross beam and any lifting attachments used to connect the load to the lifting equipment shall be designed, fabricated, operated, tested, inspected, and maintained in accordance with applicable sections and guidance of NUREG-0612, Section 5.1. This includes applicable stress limits from ANSI N14.6.
 3. The lifting equipment shall have redundant drop protection features which prevent uncontrolled lowering of the load.
- d. The lift height of the loaded HI-TRAC above the transport route surface or other supporting surface shall be limited to 6 inches, except as provided in Specification 5.1.c.

5.2 Metamic Coupon Sampling Program

A coupon surveillance program shall be implemented to maintain surveillance of the Metamic neutron absorber material under the radiation, chemical, and thermal environment of the STC.

The surveillance program will be implemented to monitor the performance of Metamic by installing a minimum of four bare coupons near the maximum gamma flux elevation (mid height) at no less than four circumferential downcomer areas around the STC fuel basket. At any time during its use the STC must have a minimum of one coupon installed in each quadrant. Metamic coupons used for testing must have been installed during the entire fuel loading history of the STC.

The following specifications apply:

- (i) Coupon size will be nominally 4" x 6". Each coupon will be marked with a unique identification number.

(continued)

5.0 PROGRAMS (continued)

- (ii) Pre-characterization testing: Before installation, each coupon will be measured and weighed. The measurements shall be taken at locations pre-specified in the test program. Each coupon shall be tested by neutron attenuation before installation in the STC. The weight, length, width, thickness, and results of the neutron attenuation testing shall be documented and retained.
- (iii) Four coupons shall be tested at the end of each inter-unit fuel transfer campaign. A campaign shall not last longer than two years. The coupons shall be measured and weighed and the results compared with the pre-characterization testing data. The results shall be documented and retained.
- (iv) The coupons shall be examined for any indication of swelling, delamination, edge degradation, or general corrosion. The results of the examination shall be documented and retained.
- (v) The coupons shall be tested by neutron attenuation and the results compared with the pre-characterization testing data. The results of the testing shall be documented and retained. Results are acceptable if the measured value is within +/-2.5% of the value measured for the same coupon at manufacturing.
- (vi) The coupons shall be returned to their locations in the STC unless anomalous material behavior is found. If the results indicate anomalous material behavior, evaluation and corrective actions shall be pursued.

5.3 Technical Specifications (TS) Bases Control Program

This program provides a means for processing changes to the Bases of these Technical Specifications.

- a. Changes to the Bases of the TS shall be made under appropriate administrative controls and reviews.
- b. Licensees may make changes to Bases without prior NRC approval provided the changes do not involve either of the following:
 - 1. a change in the TS incorporated in the license; or
 - 2. a change to the updated FSAR or Bases that requires NRC approval pursuant to 10 CFR 50.59.
- c. The Bases Control Program shall contain provisions to ensure that the Bases are maintained consistent with the UFSAR.
- d. Proposed changes that do not meet the criteria of Specification 5.3.b above shall be reviewed and approved by the NRC prior to implementation. Changes to the Bases implemented without prior NRC approval shall be provided to the NRC on a frequency consistent with 10 CFR 50.71(e).

(continued)

5.0 PROGRAMS (continued)

5.4 Radiation Protection Program

- 5.4.1 The radiation protection program shall appropriately address STC loading and unloading conditions, including transfer of the loaded TRANSFER CASK outside of facilities governed by 10 CFR Part 50. The radiation protection program shall include appropriate controls for direct radiation and contamination, ensuring compliance with applicable regulations, and implementing actions to maintain personnel occupational exposures As Low As Reasonably Achievable (ALARA). The actions and criteria to be included in the program are provided below.
- 5.4.2 Total (neutron plus gamma) measured dose rates shall not exceed the following:
- a. 1400 mrem/hr on the top of the STC (with lid in place).
 - b. 5 mrem/hr on the side of the TRANSFER CASK
- 5.4.3 The STC and TRANSFER CASK surface neutron and gamma dose rates shall be measured as described in Section 5.4.6 for comparison against the limits established in Section 5.4.2.
- 5.4.4 If the measured surface dose rates exceed the limits established in Section 5.4.2, then:
- a. Administratively verify that the correct contents were loaded in the correct fuel basket cell locations.
 - b. Perform a written evaluation to determine whether TRANSFER OPERATIONS can proceed without exceeding the dose limits of 10 CFR 72.104 or 10 CFR 20.1301.
- 5.4.5 If the verification and evaluation performed pursuant to Section 5.4.4 show that the fuel is loaded correctly and the dose rates from the STC and TRANSFER CASK will not cause the dose limits of 10 CFR 72.104 or 10 CFR 20.1301 to be exceeded, TRANSFER OPERATIONS may occur. Otherwise, TRANSFER OPERATIONS shall not occur until appropriate corrective action is taken to ensure the dose limits are not exceeded.
- 5.4.6 STC and TRANSFER CASK surface dose rates shall be measured at approximately the following locations:
- a. The dose rate measurement shall be taken at the approximate center of the STC top lid. Two (2) additional measurements shall be taken on the STC lid approximately 180 degrees apart and 12 to 18 inches from the center of the lid, avoiding the areas around the inlet and outlet ports. The measurements must be taken when the STC is in the HI-TRAC after the steam space is established and prior to HI-TRAC lid installation.

(continued)

5.0 PROGRAMS (continued)

- b. A minimum of four (4) dose rate measurements shall be taken on the side of the TRANSFER CASK approximately at the cask mid-height plane. The measurement locations shall be approximately 90 degrees apart around the circumference of the cask. Dose rates shall be measured between the radial ribs of the water jacket.